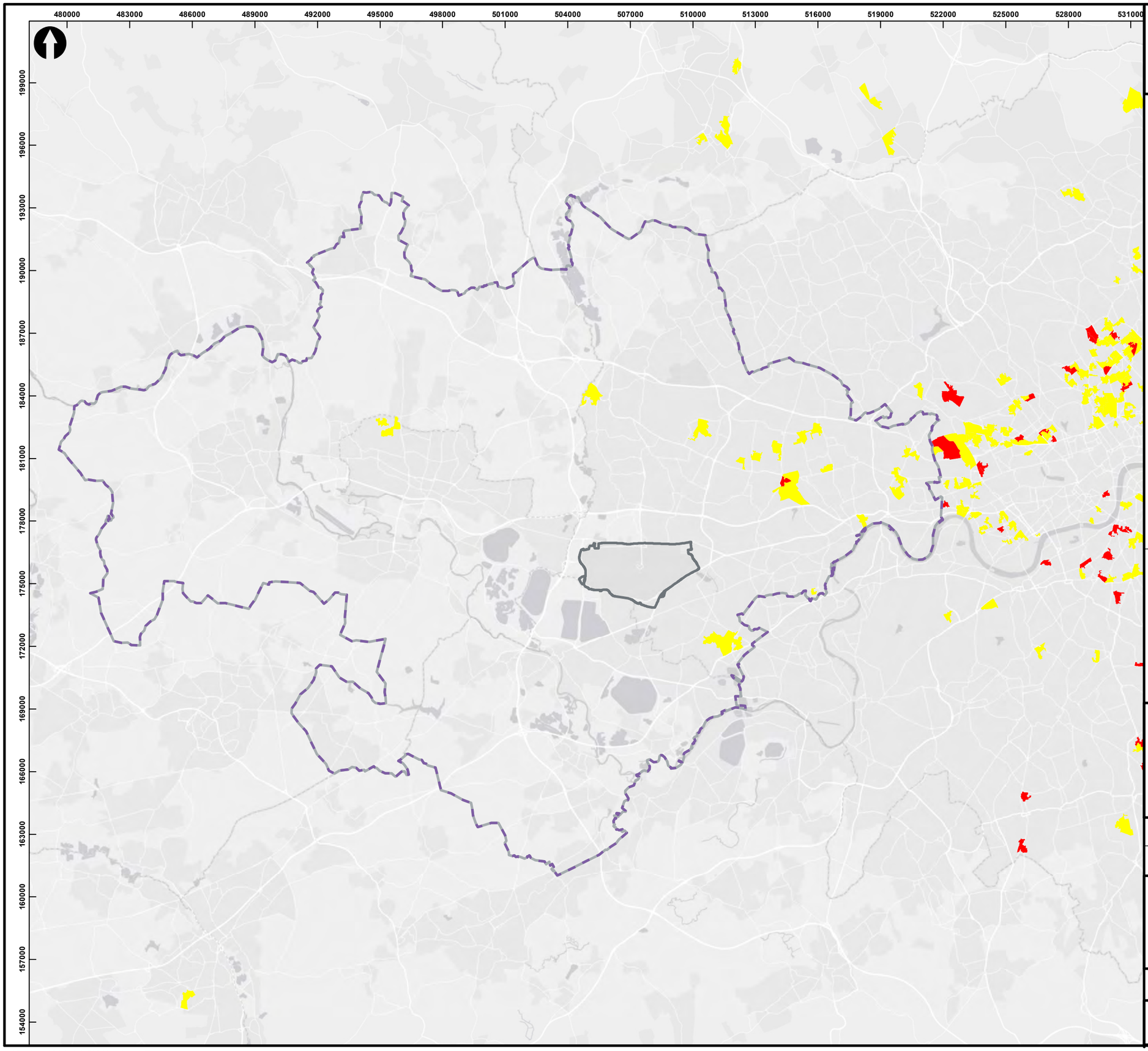
Heathrow EIA Addendum Scoping Report Appendices

Part 3: Pages 1751 – 2750

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Heathrow Planning Boundary

Wider study area (core study area)

IMD health 2015

10% most deprived

20% most deprived

0 900 1,800 3,600 5,400 7,200 9,000 10,800
Metres

Scale 1:180,000

Heathrow

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Scale 1:180,000

Project Name
Heathrow Expansion Project

Heathrow Project No.
HEP53

Title
Figure 9.2.12: Indices of multiple deprivation - health domain 2015

Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	GREES	NOYCA	10/05/2018	FINAL

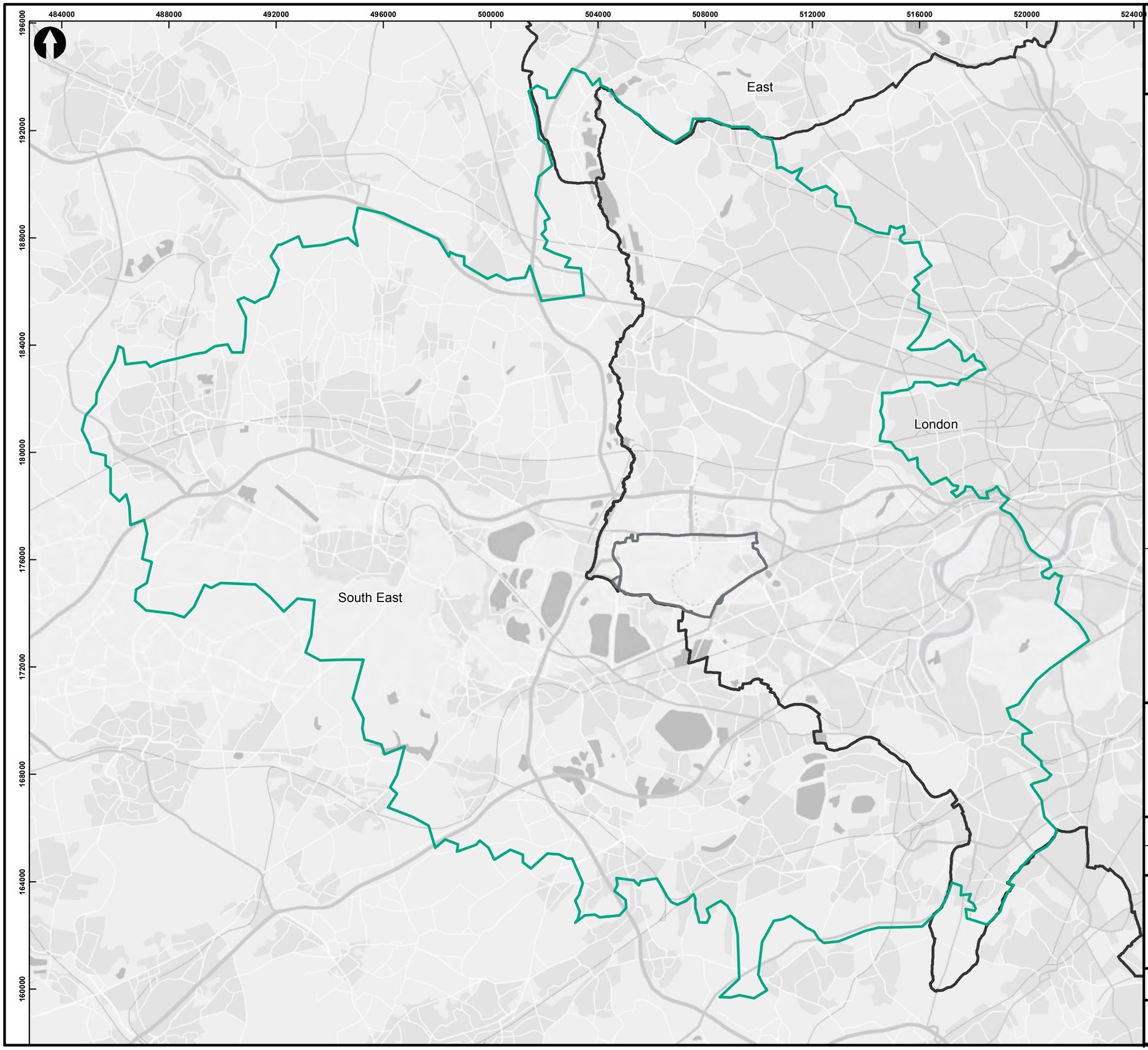
Location-Level-Sub Series/System-Identifier
HEP53-XX-GA-XXX-000130

Version
1.0

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ISO A3 Landscape



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- Heathrow Planning Boundary
- Heathrow and Slough travel to work area
- London and the South East regions

0 700 1,400 2,800 4,200 5,600 7,000 8,400
Metres

Scale 1:140,000

Heathrow

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Scale 1:140,000	
Project Name: Heathrow Expansion Project	Heathrow Project No.: HEP53

Title

Figure 9.2.13: Heathrow and Slough travel to work area

Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	BUTLS	KUFFA	10/05/2018	FINAL

Location-Level-Sub Series/System-Identifier	Version
HEP53-XX-GA-XXX-000131	1.0

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Resources identified within the recreational spaces and routes study area

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1. RECREATIONAL SPACES

1.1.1 The desk study undertaken to inform the baseline for the assessment of open spaces and routes used for informal recreation has identified 216 recreational open spaces within the recreational spaces and routes study area. This is an initial list of resources to be included in the assessment and will be refined through field survey and consultation feedback.

1.1.2 An overview of all the recreational open spaces within the recreational spaces and routes study area is provided on Figure 9.3.1. The recreational open spaces within each Local Planning Authority falling within the recreational spaces and routes study area are set out in Table 9.3.1 to Table 9.3.6 and shown on Figures 9.3.2 to 9.3.7. Each identified resource has been given a unique ID to aid identification.

1.2 Recreational spaces within the London Borough of Hillingdon

1.2.1 The recreational spaces identified within the part of the London Borough of Hillingdon that falls within the recreational spaces and routes study area are set out in Table 9.3.1 and shown on Figure 9.3.2.

Table 9.3.1 Recreational spaces within the London Borough of Hillingdon

ID	Typology	Name
A0013	Semi-natural Green Space	Open Space between Hatch Lane and Pinglestone Close
A0015	Amenity Green Space	Sipson Meadow
A0019	Amenity Green Space	The Closes
A0020	Amenity Green Space	Harlington Pond Community Green
A0021	Amenity Green Space	The Dell
A0056	Amenity Green Space	Pinkwell Park
A0057	Amenity Green Space	Drayton Hall Grounds
A0058	Amenity Green Space	Harmondsworth Recreation Ground
A0060	Amenity Green Space	Longford Pocket Park
A0061	Amenity Green Space	Boltons Lane Open Space
A0066	Cemetries and Churchyards	St. Mary's Churchyard
A0067	Cemetries and Churchyards	St. Peter and St. Paul Churchyard

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Heathrow Expansion
Resources identified within the recreational spaces and routes study area

ID	Typology	Name
A0070	Cemetries and Churchyards	Cherry Lane Cemetery
A0071	Cemetries and Churchyards	West Drayton Cemetery
A0073	Parks and Gardens	Cranford Park
A0074	Parks and Gardens	Bedfont Lakes Country Park
A0076	Parks and Gardens	Avenue Park
A0078	Parks and Gardens	Harmondsworth Moor
A0080	Parks and Gardens	Berkeley Meadows
A0112	Semi-natural Green Space	Reservoir (no access)
A0118	Semi-natural Green Space	Open Space between M4 and A408
A0120	Semi-natural Green Space	Crane Meadows
A0121	Semi-natural Green Space	Crane Meadows
A0123	Semi-natural Green Space	Unused/Wasteland West of M4
A0124	Semi-natural Green Space	Frays Island and Mabey's Meadow Nature Reserve
A0125	Semi-natural Green Space	Caines Lane Biodiversity Site
A0126	Semi-natural Green Space	Orphaned land North-west of M4 J4
A0127	Semi-natural Green Space	Field west of A408 Stockley Road
A0128	Semi-natural Green Space	West of West Drayton Cemetery
A0129	Amenity Green Space	Recreation Ground South of Lavender Rise
A0130	Amenity Green Space	Beech Close Open Space
A0131	Semi-natural Green Space	Maryfields Lake
A0132	Semi-natural Green Space	Harmondsworth Moor North of M4
A0134	Semi-natural Green Space	Agricultural Land
A0136	Semi-natural Green Space	Longford Moor
A0137	Semi-natural Green Space	North (and West?) of Harmondsworth Tithe Barn
A0141	Play Area	Play Area off Heathrow Close (XREF A0064)
A0142	Play Area	Harmondsworth Recreation Ground (XREF A0058)
A0151	Play Area	Cranford Park (XREF A0080)

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Heathrow Expansion
Resources identified within the recreational spaces and routes study area

ID	Typology	Name
A0152	Play Area	Sipson Recreation Ground (XREF A0059)
A0153	Play Area	Browngraves Green (XREF A0051)
A0154	Play Area	Sipson Meadow Recreation Ground (XREF A0015)
A0155	Play Area	Brickfield Lane Recreation Ground (XREF A0053)
A0156	Play Area	Carfax Road Recreation Ground
A0158	Play Area	Pinkwell Park (XREF A0018)
A0159	Play Area	Recreation Ground and Public Open Space south and east of The Brambles
A0161	Play Area	Recreation Ground at northern end of The Closes (XREF A 0019)
A0162	Play Area	Recreation Ground South of Lavender Rise (XREF A0129)
A0163	Play Area	Recreation Ground east of Thornton Avenue
A0198	Waterbody	Grand Union Canal
A0201	Waterbody	Grand Union Canal
A0231	Waterbody	Packet Boat Marina (GUC)
A0232	Waterbody	Grand Union Canal (Slough Arm)
A0236	Waterbody	Lakes in Colne CP S of GUC (W)
A0237	Waterbody	Lakes/Ponds in Colne CP S of GUC (E)
A0324	Parks and Gardens	Huntsmoor Park
A0325	Green Corridor	Green Space east of T4 and A30
A0326	Green Corridor	Green space along Longford River
A0327	Amenity Green Space	POS within Junction 14 of M25
A0328	Semi-natural Green Space	Green space between M25 and minor watercourse, within redline
A0329	Green Corridor	Green Space between M25 and Harmondsworth Moor
A0330	Amenity Green Space	Green Space within BA HQ
A0331	Amenity Green Space	The Green, West Drayton

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ID	Typology	Name
A0332	Semi-Natural Green Space	The Southlands
A0333	Green Corridor	Green Space north of M4 at Harmondsworth Lane
A0334	Semi-Natural Green Space	Gravel Pit
A0335	Semi-Natural Green Space	Woodland west of Heathrow Primary School
A0336	Amenity Green Space	Kingston Lane Recreation Ground
A0337	Green Corridor	Green Spaces within Housing Development
A0338	Green Corridor	Treebelt to south of rail line S of Stockley Park
A0339	Green Corridor	Stockley Rd Lake
A0340	Amenity Green Space	Dawley Rd/A437 Green Space
A0342	Semi-Natural Green Space	Green Space between GUC and A312, Hayes
A0345	Semi-Natural Green Space	Little Britain
A0363	Amenity Green Space	Bedfont Close Green Space
A0385	Play Area	Cowley - Play area
A0395	Play Area	Play Area east of Milton Way

1.3 Recreational spaces within the London Borough of Hounslow

1.3.1 The recreational spaces identified within the part of the London Borough of Hounslow that falls within the recreational spaces and routes study area are set out in Table 9.3.2 and shown on Figure 9.3.3.

Table 9.3.2 Recreational spaces within the London Borough of Hounslow

ID	Typology	Name
A0001	Semi-natural Green Space	Wayne Avenue Open Space Adjacent to Allotments
A0002	Semi-natural Green Space	Open Space E of Clements Court
A0022	Amenity Green Space	Beaversfield Park
A0023	Amenity Green Space	Open Space on Calvary Crescent
A0025	Amenity Green Space	Bedfont Green

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Heathrow Expansion
Resources identified within the recreational spaces and routes study area

ID	Typology	Name
A0031	Amenity Green Space	Myrtle Avenue Playground
A0048	Amenity Green Space	Chester Road Open Space
A0054	Amenity Green Space	Cage Park
A0065	Cemetries and Churchyards	N churchyard of St. Mary the Virgin, Bedfont. S Open Space S of Hatton Road
A0068	Cemetries and Churchyards	Bedfont Cemetery
A0069	Cemetries and Churchyards	NE Hatton Cemetery, Feltham. SW no access
A0075	Parks and Gardens	Hounslow Heath
A0076	Parks and Gardens	Avenue Park
A0080	Parks and Gardens	Berkeley Meadows
A0122	Semi-natural Green Space	Bedfont Lake and The Pitts
A0125	Semi-natural Green Space	Caines Lane Biodiversity Site
A0146	Play Area	Feltham Park (XREF A0026)
A0147	Play Area	Cage Park (XREF A0054)
A0148	Play Area	Bedfont Recreation Ground (XREF A0024)
A0149	Play Area	Chester Road Open Space (XREF A0048)
A0150	Play Area	Waye Avenue Recreation Ground (XREF A0050)
A0207	Waterbody	Longford River (SE)
A0352	Parks and Gardens	Midsummer Avenue Park
A0354	Semi-Natural Green Space	Crane Corridor
A0355	Semi-Natural Green Space	Hatton Meadow
A0356	Amenity Green Space	Open Space in front of 101-107 Great South West Rd
A0357	Parks and Gardens	Grantley Road Park
A0358	Amenity Green Space	Aston Green Rectory Estate
A0360	Amenity Green Space	Firs Drive Open Space
A0361	Semi-Natural Green Space	Hartlands Wood and Lower Park Farm
A0363	Amenity Green Space	Bedfont Close Green Space
A0364	Amenity Green Space	Fairholme Open Space
A0365	Amenity Green Space	Grovestile Waye

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Heathrow Expansion
Resources identified within the recreational spaces and routes study area

ID	Typology	Name
A0366	Amenity Green Space	Fruen Road Open Space
A0367	Amenity Green Space	Land East of Bedfont Pits
A0375	Play Area	Beaversfield Park - Play area
A0376	Play Area	Calvary Crescent - Play area
A0378	Amenity Green Space	Feltham Park
A0388	Play Area	Midsummer Avenue - Play area
A0389	Play Area	Grantley Rd Park - Play area
A0432	Amenity Green Space	Cranebank A30 verge
A0433	Amenity Green Space	Amenity space alongside Green Lane
A0434	Amenity Green Space	Amenity space Chester Way x Fusiliers Way
A0435	Amenity Green Space	Amenity space Beavers Lane
A0436	Amenity Green Space	Amenity space Chinchilla Lane
A0437	Amenity Green Space	Amenity space Burns Ave
A0438	Green Corridor	Green Lane accessing Southville Juniors School
A0439	Amenity Green Space	Amenity space Cobbs Rd Hounslow
A0441	Amenity Green Space	Green space along A315, East Bedfont west
A0442	Amenity Green Space	Green space along A315, East Bedfont east
A0443	Amenity Green Space	Green space along A315, across from Bedfont Green
A0444	Amenity Green Space	Green space along A315, across from Fairholme
A0446	Amenity Green Space	Southville Green
A0447	Green Corridor	Link to Hounslow Heath
A0448	Amenity Green Space	POS within Sparrow Farm residential development
A0449	Amenity Green Space	POS at Hatton Green

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1.4 Recreational spaces within the Borough of Spelthorne

1.4.1 The recreational spaces identified within the part of the Borough of Spelthorne that falls within the recreational spaces and routes study area are set out in Table 9.3.3 and shown on Figure 9.3.4.

Table 9.3.3 Recreational Spaces within the Borough of Spelthorne.

ID	Typology	Name
A0035	Amenity Green Space	Stanwell Moor Recreation Ground
A0036	Amenity Green Space	Hithermoor Pocket Park
A0037	Amenity Green Space	Recreation Ground (play, tennis, bowls) off Oaks Road
A0038	Amenity Green Space	Village Park
A0039	Amenity Green Space	Stanwell Recreation Ground
A0040	Amenity Green Space	Long Lane Recreation Ground
A0041	Play Area	The Nightingales (Nuthatch Close)
A0042	Amenity Green Space	Diamedes Avenue/ Rose Garden
A0049	Amenity Green Space	Selwood Gardens
A0072	Cemetries and Churchyards	Churchyard of St. Mary the Virgin, Stanwell
A0109	Semi-natural Green Space	Open Space North of Stanwell
A0110	Semi-natural Green Space	Clay Lane
A0116	Semi-natural Green Space	Open Space to rear of commercial units on Clay Lane
A0119	Semi-natural Green Space	Staines Moor
A0143	Play Area	Stanwell Moor Recreation Ground (XREF A0035 and A0085)
A0144	Play Area	Recreation Ground (play, tennis, bowls) off Oaks Road (XREF A0037)
A0145	Play Area	Long Lane Recreation Ground (XREF A0040)
A0215	Waterbody	Wraysbury River (S)
A0218	Waterbody	River Colne (southern section)
A0269	Waterbody	River Ash

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Heathrow Expansion
Resources identified within the recreational spaces and routes study area

ID	Typology	Name
A0295	Semi-natural Green Space	Staines Moor
A0296	Semi-natural Green Space	Shortwood Common and Birch Green
A0300	Parks and Gardens	Lammas Recreation Ground
A0301	Cemetries and Churchyards	St Mary's, Staines
A0302	Parks and Gardens	Staines Riverside
A0303	Semi-natural Green Space	Moormede Open Space
A0304	Parks and Gardens	Victoria Jubilee Gardens
A0305	Amenity Green Space	Hengrove Recreation Ground
A0306	Cemetries and Churchyards	Staines Cemetery
A0308	Amenity Green Space	Echelforde Recreation Ground
A0309	Amenity Green Space	Scott Freeman Gardens
A0310	Cemetries and Churchyards	Ashford Burial Ground
A0311	Cemetries and Churchyards	Stanwell Cemetery
A0312	Amenity Green Space	Holywell Way
A0313	Amenity Green Space	Linear POS along Hadrian Way
A0315	Amenity Green Space	POS along Town Lane
A0380	Play Area	Moormede - Play area
A0381	Play Area	Hengrove Recreation Ground - Play area
A0383	Play Area	Hadrian Way - Play area
A0390	Play Area	Village Park - Play area
A0394	Play Area	Holywell Way- Play area
A0397	Play Area	Lammas Recreation Ground - Play area
A0402	Amenity Green Space	Lauser Road Park - Town Lane Rec Ground (Local Park)
A0403	Play Area	Lauser Road Pocket Park west
A0404	Play Area	Lauser Road Pocket Park east
A0405	Amenity Green Space	Jordans Close/Town Lane amenity space
A0410	Amenity Green Space	Victory Close Pocket Park
A0413	Amenity Green Space	Land to the West of Edward Way, Ashford
A0419	Semi-natural Greenspace	Sykes Meadow

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ID	Typology	Name
A0421	Semi-natural Greenspace	Birches Green
A0422	Semi-natural Greenspace	Leacroft Staines
A0423	Semi-natural Greenspace	Priory Green
A0424	Semi-natural Greenspace	Shortwood Common South
A0428	Parks and Gardens	Staines Memorial Gardens
A0431	Amenity Green Space	The Cog, Wraysbury Rd
A0440	Amenity Green Space	Coal Tax Gardens

1.5 Recreational spaces within the Royal Borough of Windsor and Maidenhead.

1.5.1 The recreational spaces identified within the part of the Royal Borough of Windsor and Maidenhead that falls within the recreational spaces and routes study area are set out in Table 9.3.4 and shown on Figure 9.3.5.

Table 9.3.4 Recreational spaces within the Royal Borough of Windsor and Maidenhead.

ID	Typology	Name
A0046	Amenity Green Space	Crown Meadow
A0117	Semi-natural Green Space	Arthur Jacob Nature Reserve
A0228	Waterbody	Colne Brook (between Colnbrook and Wraysbury)
A0229	Waterbody	Colne Brook (between Wraysbury and Thames)
A0264	Waterbody	Horton Lakes (N of railway)
A0265	Waterbody	River Thames
A0266	Waterbody	Wraysbury Lake
A0267	Waterbody	Road Lake
A0268	Waterbody	Lakes between Colne Brook and Wraysbury Reservoir
A0299	Semi-natural Green Space	OAL at Ankerwycke Farm
A0322	Semi-natural Green Space	POS north of Douglas Lane, Wraysbury
A0396	Semi-natural Green Space	Poyle Poplars

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1.6 Recreational spaces within the Borough of Slough.

1.6.1 The recreational spaces identified within the part of the Borough of Slough that falls within the recreational spaces and routes study area are set out in Table 9.3.5 and shown on Figure 9.3.6.

Table 9.3.5 Recreational spaces within the Borough of Slough.

ID	Typology	Name
A0044	Amenity Green Space	Humber Way Open Space
A0045	Amenity Green Space	Stornaway Road Green Space
A0046	Amenity Green Space	Crown Meadow
A0062	Amenity Green Space	Pippins Park
A0063	Amenity Green Space	Albany Park
A0138	Play Area	Colnbrook Recreation Ground (XREF A0047)
A0139	Play Area	Colnbrook Recreation Ground (XREF A0047)
A0140	Play Area	Pippins Park (XREF A0062)
A0227	Waterbody	Colne Brook (between M4 and Colnbrook)
A0228	Waterbody	Colne Brook (between Colnbrook and Wraysbury)
A0396	Semi-natural Green Space	Poyle Poplars
A0450	Semi-natural Green Space	Old Wood

1.7 Recreational spaces within the South Bucks District.

1.7.1 The recreational spaces identified within the part of the South Bucks District that falls within the recreational spaces and routes study area are set out in Table 9.3.6 and shown on Figure 9.3.7.

Table 9.3.6 Recreational spaces within the South Bucks District.

ID	Typology	Name
A0113	Semi-natural Green Space	Thorney Country Park
A0124	Semi-natural Green Space	Frays Island and Mabey's Meadow Nature Reserve
A0131	Semi-natural Green Space	Maryfields Lake

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Heathrow Expansion
Resources identified within the recreational spaces and routes study area

ID	Typology	Name
A0226	Waterbody	Colne Brook (between GUC and M4)
A0232	Waterbody	Grand Union Canal (Slough Arm)
A0236	Waterbody	Lakes in Colne CP S of GUC (W)
A0318	Amenity Green Space	Iver Green (name TBC)
A0319	Semi-natural Green Space	Farlows Lake
A0321	Semi-natural Green Space	POS north of Iver Station
A0345	Semi-Natural Green Space	Little Britain
A0392	Play Area	Iver Recreation Ground - Play area

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2. RECREATIONAL ROUTES

2.1.1 The desk study undertaken to inform the baseline for the assessment of open spaces and routes used for informal recreation has identified over 300 recreational routes, including cycle routes, long distance footpaths and local Public Rights of Way (PRoWs), within the recreational spaces and routes study area. This is an initial list of resources to be included in the assessment and will be refined through field survey and consultation feedback.

2.2 Nationally, Regionally and Locally Promoted Walking Routes

2.2.1 Within the recreational spaces and routes study area, one National Trail, seven Regional Trails and six Locally Promoted Walks were identified. These routes are set out in Table 9.3.7 and shown in overview on Figure 9.3.8, and in detail on Figures 9.3.9 through 9.3.12.

2.2.2 In the case of the long distance footpaths, such as the Grand Union Canal, which crosses the study area from east to west, and has several branches within the study area, the route has been subdivided into sections, each with a unique ID number. The ID number refers to the section of path found on the ground.

2.2.3 In some instances, multiple named routes may follow the same section of path, hence the same ID number may apply to a section forming part of several routes. For example, R0042 refers to a section of towpath along the Grand Union Canal Slough Arm, which simultaneously hosts the Grand Union Canal Walk, Shakespeare's Way and Beeches Way long distance footpaths.

Table 9.3.7 Nationally, Regionally and Locally Promoted Walking Routes

ID	Typology	Name
R0052, R0053	National Trail	The Thames Path
R0042, R0045, R0046, R0058, R0060, R0330	Regional Trail	Beeches Way
R0045, R0047, R0057, R0060, R0332	Regional Trail	Colne Valley Trail
R0054 to R0056	Regional Trail	Colne Valley Way
R0036 to R0043	Regional Trail	Grand Union Canal Walk
R0036, R0038 and R0048	Regional Trail	Hillingdon Trail
R0038 to R0040, R0044, R0045, R0047 to R0050, R0333	Regional Trail	London Loop

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ID	Typology	Name
R0037 to R0040, R0042, R0045, R0058, R0060	Regional Trail	Shakespeare's Way
R0026	Locally Promoted Walk	Lammas Lakes to Staines Moor
R0029	Locally Promoted Walk	Ankerwycke to Runnymede
R0030	Locally Promoted Walk	Donkey Wood
R0031	Locally Promoted Walk	Cranford Park & Avenue Park
R0032	Locally Promoted Walk	Bedfont Lakes
R0033	Locally Promoted Walk	Hounslow Heath

2.3 Public Right of Way Network

2.3.1 Within the recreational spaces and routes study area, numerous local footpaths, bridleways and byways were identified. These routes are organised by their host Local Planning Authority, and are set out in Table 9.3.8 to Table 9.3.13, and shown in overview on Figure 9.3.13, and in detail on Figures 9.3.14 through 9.3.19.

Public Rights of Way within London Borough of Hillingdon

2.3.2 The Public Rights of Way identified within the part of the London Borough of Hillingdon that falls within the recreational spaces and routes study area are set out in Table 9.3.8 and shown on Figure 9.3.14.

Table 9.3.8 Public Rights of Way within London Borough of Hillingdon

ID	Typology	Name
R0219	Local Byway	Hillingdon PRoW Y23
R0220	Local Bridleway	Hillingdon PRoW Y13
R0221	Local Byway	Hillingdon PRoW Y12
R0222	Local Footpath	Hillingdon PRoW Y11
R0223	Local Footpath	Hillingdon PRoW Y10
R0224	Local Byway	Hillingdon PRoW Y9
R0225	Local Footpath	Hillingdon PRoW Y21
R0226	Local Footpath	Hillingdon PRoW Y20
R0227	Local Footpath	Hillingdon PRoW Y15
R0228	Local Footpath	Hillingdon PRoW Y19

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ID	Typology	Name
R0229	Local Footpath	Hillingdon PRoW Y8
R0230	Local Footpath	Hillingdon PRoW Y5
R0231	Local Footpath	Hillingdon PRoW Y4
R0232	Local Footpath	Hillingdon PRoW Y6
R0237	Local Footpath	Hillingdon PRoW Y22
R0238	Local Footpath	Hillingdon PRoW H68
R0239	Local Footpath	Hillingdon PRoW H81
R0240	Local Footpath	Hillingdon PRoW H80
R0241	Local Footpath	Hillingdon PRoW H75
R0242	Local Footpath	Hillingdon PRoW H63
R0243	Local Footpath	Hillingdon PRoW unnamed
R0244	Local Footpath	Hillingdon PRoW H78
R0245	Local Footpath	Hillingdon PRoW H60
R0246	Local Footpath	Hillingdon PRoW H79
R0247	Local Footpath	Hillingdon PRoW H57
R0248	Local Footpath	Hillingdon PRoW unnamed
R0249	Local Byway	Hillingdon PRoW H70
R0278	Local Footpath	Hillingdon PRoW unnamed
R0279	Local Bridleway	Hillingdon PRoW unnamed
R0304	Local Footpath	Hillingdon PRoW Y28

Public Rights of Way within London Borough of Hounslow

2.3.3 The Public Rights of Way identified within the part of the London Borough of Hounslow that falls within the recreational spaces and routes study area are set out in Table 9.3.9 and shown on Figure 9.3.15.

Table 9.3.9 Public Rights of Way within London Borough of Hounslow

ID	Typology	Name
R0211	Local Footpath	Hounslow PRoW
R0212	Local Footpath	Hounslow PRoW
R0213	Local Footpath	Hounslow PRoW
R0217	Local Footpath	Hounslow PRoW
R0218	Local Byway	Hounslow PRoW

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Public Rights of Way within the Borough of Spelthorne

2.3.4 The Public Rights of Way identified within the part of the Borough of Spelthorne that falls within the recreational spaces and routes study area are set out in Table 9.3.10 and shown on Figure 9.3.16.

Table 9.3.10 Public Rights of Way within the Borough of Spelthorne

ID	Typology	Name
R0153	Local Bridleway	Staines PRoW 51
R0154	Local Bridleway	Staines PRoW 51
R0155	Local Bridleway	Staines PRoW 51
R0156	Local Footpath	Staines PRoW 2
R0157	Local Bridleway	Staines PRoW 50
R0158	Local Footpath	Staines PRoW 9
R0159	Local Bridleway	Staines PRoW 3
R0160	Local Footpath	Staines PRoW 4
R0161	Local Footpath	Staines PRoW 7
R0162	Local Footpath	Staines PRoW 6
R0163	Local Footpath	Staines PRoW 7a
R0164	Local Footpath	Staines PRoW 8
R0165	Local Footpath	Staines PRoW 3
R0166	Local Footpath	Staines PRoW 10
R0167	Local Footpath	Staines PRoW 11
R0168	Local Footpath	Staines PRoW 12
R0169	Local Footpath	Staines PRoW 14
R0170	Local Footpath	Staines PRoW 19
R0171	Local Footpath	Staines PRoW 17
R0172	Local Footpath	Staines PRoW 18
R0173	Local Footpath	Staines PRoW 20
R0174	Local Footpath	Staines PRoW 20
R0175	Local Footpath	Staines PRoW 49
R0176	Local Footpath	Staines PRoW 22
R0177	Local Footpath	Staines PRoW 21
R0178	Local Footpath	Staines PRoW 45
R0179	Local Footpath	Staines PRoW 13

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ID	Typology	Name
R0180	Local Footpath	Staines PRoW 43
R0181	Local Footpath	Staines PRoW 43
R0206	Local Footpath	Staines PRoW 24
R0207	Local Footpath	Staines PRoW 25
R0208	Local Footpath	Staines PRoW 26
R0209	Local Byway	Staines PRoW 42
R0210	Local Footpath	Staines PRoW 69
R0290	Local Footpath	Staines PRoW 5
R0291	Local Footpath	Staines PRoW 23
R0309	Local Footpath	Staines NCP Prow 47
R0310	Local Footpath	Staines NCP Prow 44
R0312	Local Bridleway	Staines NCP Prow 51
R0313	Local Footpath	Staines NCP Prow 16

Public Rights of Way within Royal Borough of Windsor and Maidenhead

2.3.5 The Public Rights of Way identified within the part of the Royal Borough of Windsor and Maidenhead that falls within the recreational spaces and routes study area are set out in Table 9.3.11 and shown on Figure 9.3.17.

Table 9.3.11 Public Rights of Way within Royal Borough of Windsor and Maidenhead

ID	Typology	Name
R0137	Local Footpath	RBWM PRoW HORT/1/1
R0138	Local Bridleway	RBWM PRoW HORT/5/1
R0139	Local Bridleway	RBWM PRoW HORT/4/1
R0140	Local Footpath	RBWM PRoW HORT/3/1
R0141	Local Footpath	RBWM PRoW WRAY/6/1
R0142	Local Footpath	RBWM PRoW WRAY/1/1
R0143	Local Footpath	RBWM PRoW WRAY/11/1
R0144	Local Footpath	RBWM PRoW WRAY/8A/1
R0145	Local Footpath	RBWM PRoW WRAY/8B/1
R0146	Local Footpath	RBWM PRoW WRAY/9/1
R0147	Local Footpath	RBWM PRoW WRAY/9/2

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ID	Typology	Name
R0148	Local Footpath	RBWM PRoW WRAY/7/1
R0149	Local Footpath	RBWM PRoW WRAY/4/1
R0150	Local Footpath	RBWM PRoW WRAY/3/1
R0151	Local Footpath	RBWM PRoW WRAY/10/1
R0152	Local Footpath	RBWM PRoW WRAY/2/1
R0298	Local Footpath	RBWM PRoW DATC/7/2
R0299	Local Footpath	RBWM PRoW DATC/7/1
R0305	Local Footpath	RBWM PRoW WRAY/11/2
R0334	Local Footpath	RBWM PRoW DATC/6/1
R0335	Local Footpath	RBWM PRoW WRAY/11/3
R0336	Local Footpath	RBWM PRoW WRAY/13/1
R0337	Local Footpath	RBWM PRoW WRAY/12/1
R0338	Local Footpath	RBWM PRoW WRAY/8C/1
R0339	Local Footpath	RBWM PRoW WRAY/8C/2

Public Rights of Way within the Borough of Slough

2.3.6 The Public Rights of Way identified within the part of the Borough of Slough that falls within the recreational spaces and routes study area are set out in Table 9.3.12 and shown on Figure 9.3.18.

Table 9.3.12 Public Rights of Way within the Borough of Slough

ID	Typology	Name
R0061	Local Bridleway	Slough PRoW 5
R0062	Local Footpath	Slough PRoW 2b
R0063	Local Bridleway	Slough PRoW 2a
R0064	Local Bridleway	Slough PRoW 6
R0065	Local Footpath	Slough PRoW 6a
R0066	Local Footpath	Slough PRoW 2
R0067	Local Footpath	Slough PRoW 1
R0068	Local Footpath	Slough PRoW 8
R0069	Local Footpath	Slough PRoW 9
R0070	Local Footpath	Slough PRoW 43

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ID	Typology	Name
R0071	Local Footpath	Slough PRoW 42
R0080	Local Footpath	Slough PRoW 41
R0082	Local Footpath	Slough PRoW 74
R0286	Local Footpath	Slough PRoW 3
R0314	Local Footpath	Slough PRoW 5A
R0315	Local Footpath	Slough PRoW 7

Public Rights of Way within South Bucks District

2.3.7 The Public Rights of Way identified within the part of South Bucks District that falls within the recreational spaces and routes study area are set out in Table 9.3.13 and shown on Figure 9.3.19.

Table 9.3.13 Public Rights of Way within South Bucks District

ID	Typology	Name
R0083	Local Footpath	South Bucks PRoW WEX/18/3
R0098	Local Bridleway	South Bucks PRoW IVE/11/1
R0099	Local Footpath	South Bucks PRoW IVE/4A/1
R0100	Local Footpath	South Bucks PRoW IVE/4A/2
R0101	Local Footpath	South Bucks PRoW IVE/27/1
R0102	Local Footpath	South Bucks PRoW IVE/26/1
R0103	Local Footpath	South Bucks PRoW IVE/25/1
R0104	Local Footpath	South Bucks PRoW IVE/28/1
R0105	Local Footpath	South Bucks PRoW IVE/29/1
R0106	Local Footpath	South Bucks PRoW IVE/28/4
R0107	Local Footpath	South Bucks PRoW IVE/35/1
R0108	Local Footpath	South Bucks PRoW IVE/28/3
R0109	Local Footpath	South Bucks PRoW IVE/36/1
R0110	Local Footpath	South Bucks PRoW IVE/30/2
R0111	Local Footpath	South Bucks PRoW IVE/16/3
R0112	Local Footpath	South Bucks PRoW IVE/17/3
R0113	Local Footpath	South Bucks PRoW IVE/17/8
R0114	Local Footpath	South Bucks PRoW IVE/17/7
R0115	Local Footpath	South Bucks PRoW IVE/16/1

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Heathrow Expansion
Resources identified within the recreational spaces and routes study area

ID	Typology	Name
R0116	Local Bridleway	South Bucks PRoW IVE/P1(BW)/1
R0117	Local Bridleway	South Bucks PRoW IVE/P1(BW)/1
R0118	Local Footpath	South Bucks PRoW IVE/21/3
R0119	Local Footpath	South Bucks PRoW IVE/16/2
R0120	Local Footpath	South Bucks PRoW IVE/21/2
R0121	Local Bridleway	South Bucks PRoW IVE/31/2
R0122	Local Footpath	South Bucks PRoW IVE/34/1
R0123	Local Footpath	South Bucks PRoW IVE/20/1
R0124	Local Footpath	South Bucks PRoW IVE/24/1
R0125	Local Footpath	South Bucks PRoW IVE/15/1
R0126	Local Footpath	South Bucks PRoW IVE/18/1
R0127	Local Footpath	South Bucks PRoW IVE/15A/1
R0128	Local Footpath	South Bucks PRoW IVE/17/5
R0129	Local Footpath	South Bucks PRoW IVE/17/6
R0130	Local Footpath	South Bucks PRoW IVE/17/1
R0131	Local Footpath	South Bucks PRoW IVE/17/4
R0132	Local Footpath	South Bucks PRoW IVE/15/2
R0133	Local Footpath	South Bucks PRoW IVE/14/1
R0134	Local Footpath	South Bucks PRoW IVE/15/3
R0135	Local Footpath	South Bucks PRoW IVE/13/1
R0287	Local Footpath	South Bucks PRoW IVE/20/2
R0288	Local Footpath	South Bucks PRoW IVE/20/3
R0289	Local Footpath	South Bucks PRoW IVE/31/1
R0292	Local Footpath	South Bucks PRoW IVE/21/1
R0293	Local Footpath	South Bucks PRoW IVE/16/4
R0294	Local Footpath	South Bucks PRoW IVE/16/5
R0306	Local Footpath	South Bucks PRoW IVE/P2(FP)1
R0307	Local Footpath	South Bucks PRoW IVE/17/2

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2.4 Promoted recreational cycle routes

2.4.1 The desk study undertaken to inform the baseline for the assessment of open spaces and routes used for informal recreation has identified 11 promoted recreational cycle routes within the recreational spaces and routes study area. This is an initial list of resources to be included in the assessment and will be refined through field survey and consultation feedback.

2.4.2 It is noted that there are extensive networks of cycle routes in the area, which may be used recreationally, however this section of the study focuses only on routes which have been identified and promoted for recreational purposes.

Nationally and Locally Promoted Cycle Routes

2.4.3 Three Sustrans National Cycle Routes were found to enter the study area, and are generally limited to the northern and southern edges of the study area.

2.4.4 Eight Locally Promoted Cycle Routes were found within, or crossing into, the study area.

2.4.5 These are listed in Table 9.3.14, and are illustrated in Figures 9.3.20 and 9.3.21.

Table 9.3.14 Nationally and Locally Promoted Cycle Routes

ID	Typology	Name
R0001	Sustrans NCN	National Route 61
R0002	Sustrans NCN	National Route 4 Thames Valley
R0326	Sustrans NCN	National Route 6
R0321	Locally Promoted Cycle Route	Hounslow park ride
R0322	Locally Promoted Cycle Route	Cranford and Heston ride
R0327	Locally Promoted Cycle Route	Hounslow local cycle track
R0329	Locally Promoted Cycle Route	The Jubilee River & Slough Linear park route
R0340	Locally Promoted Cycle Route	Spelthorne Route 1 Ashford-Staines upon Thames
R0341	Locally Promoted Cycle Route	Spelthorne Route 4 Staines upon Thames to Shepperton
R0342	Locally Promoted Cycle Route	Spelthorne Route 5 Staines upon Thames to Thorpe
R0343	Locally Promoted Cycle Route	Spelthorne Route 6 Laleham to Chertsey

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ID	Typology	Name
R0344	Locally Promoted Cycle Route	Spelthorne Route 8 Stanwell Moor to Wraysbury to Staines upon Thames

2.5 Other identified cycling resources

2.5.1 A dense network of on- and off-road cycling routes which are promoted by local councils and other bodies has been noted within the study area, however due to the extensive nature of the cycle network, no attempt has been made to individually identify these routes at this stage.

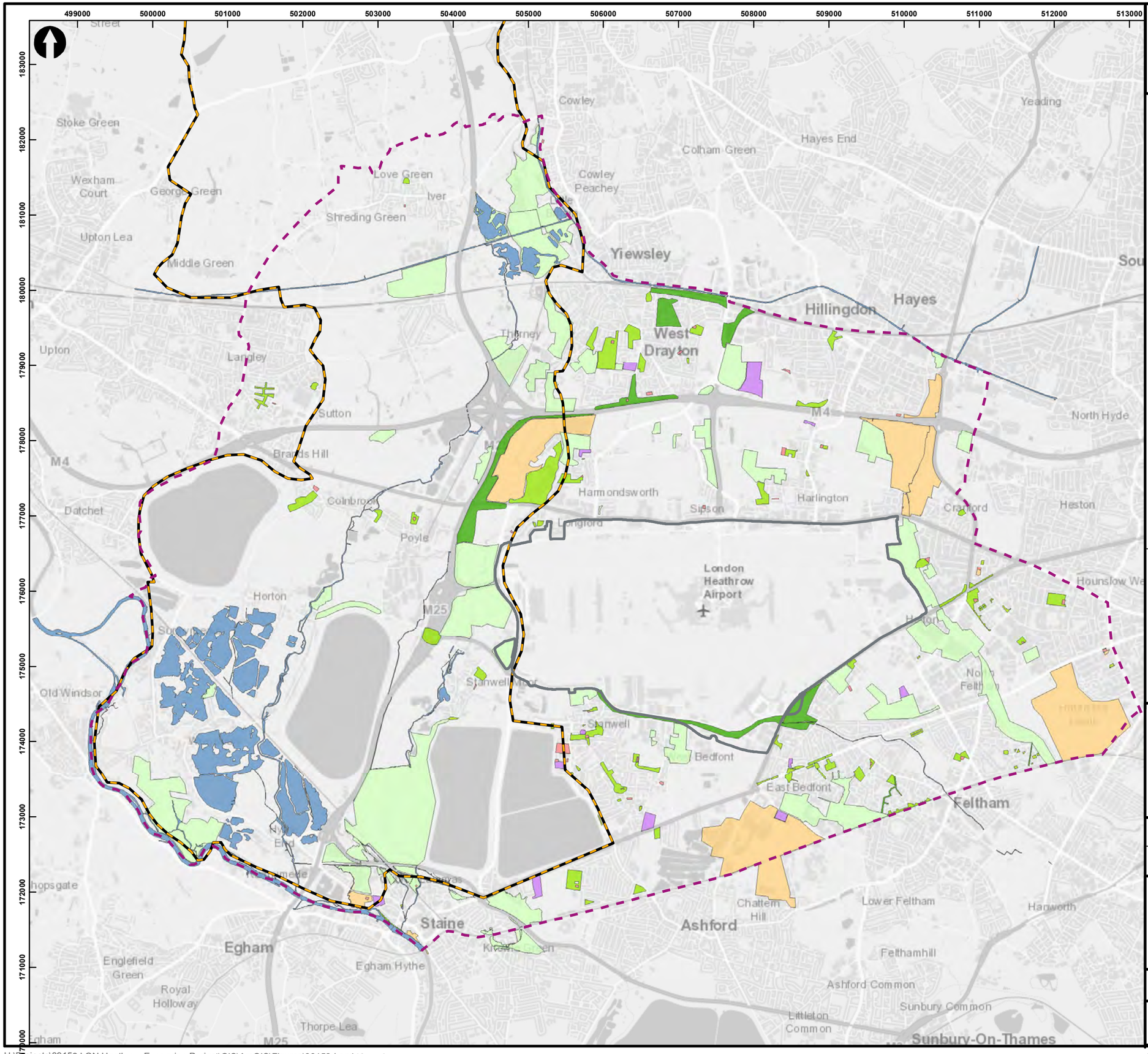
Regional Cycle Network

2.5.2 Transport for London (TfL) has identified a network of cycle routes which extends from central London to the M25. This network is shown on Figure 9.3.22.

Local Cycle Network

2.5.3 Within the study area, some Local Planning Authorities have published plans showing cycle routes within their boundaries. The Local Planning Authorities with available plans included in this study are Hillingdon, Windsor and Maidenhead, Slough and Spelthorne. This network is shown in Figure 9.3.23.

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- Heathrow Planning Boundary
- Recreational spaces and routes study area
- Colne Valley Regional Park

Areas of informal recreation

- Amenity Green Space
- Cemetries and Churchyards
- Green Corridor
- Parks and Gardens
- Play Area
- Semi-natural Green Space
- Waterbody

0 250 500 1,000 1,500 2,000 2,500 3,000 Metres

Scale 1:50,000

Heathrow

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Scale	Project Name	Heathrow Project No.
1:50,000	Heathrow Expansion Project	HEP53

Title

Figure 9.3.1: Areas of informal recreation identified within the recreational spaces and routes study area

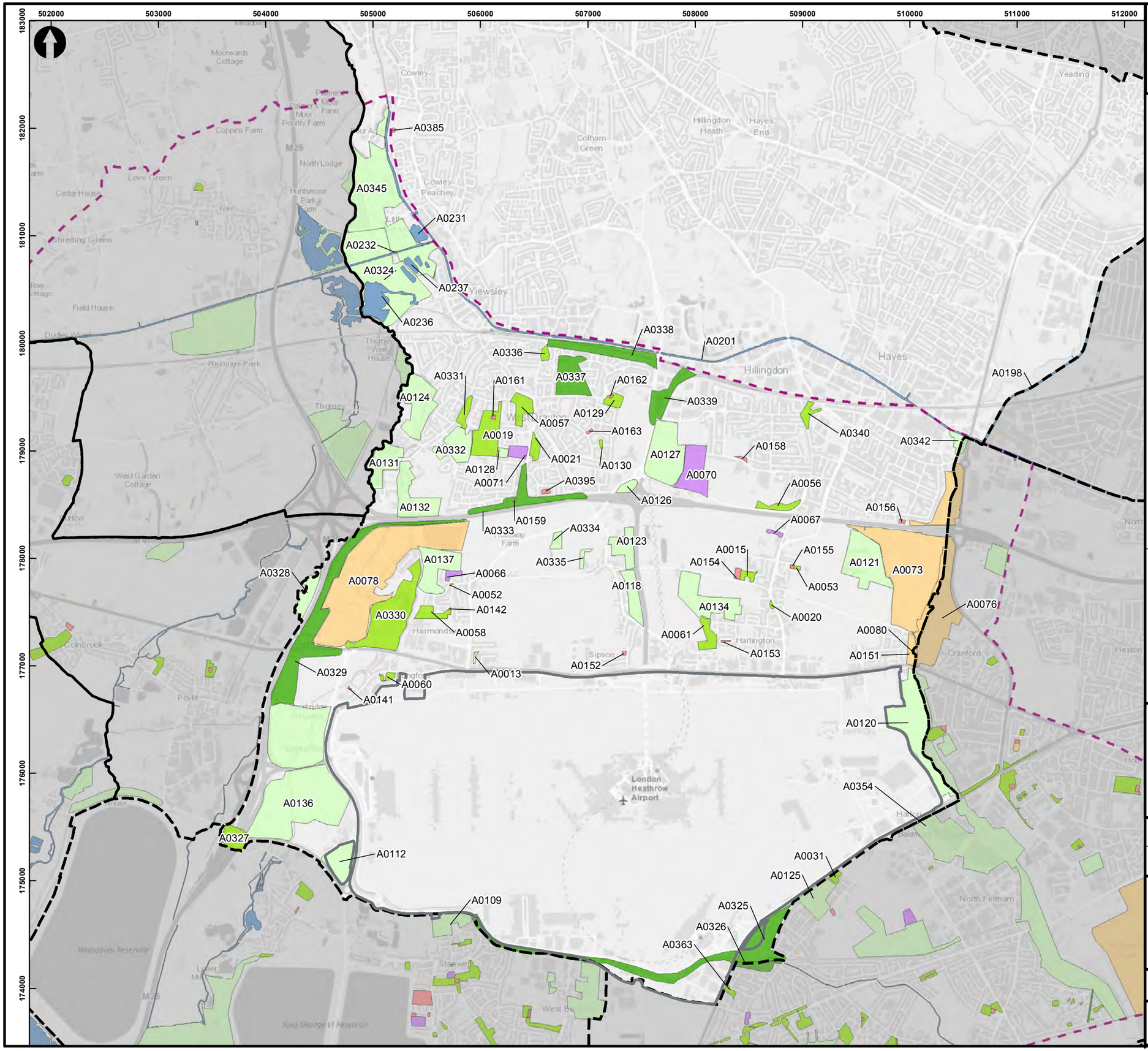
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- Heathrow Planning Boundary
- Recreational spaces and routes study area
- Local Planning Authority boundaries

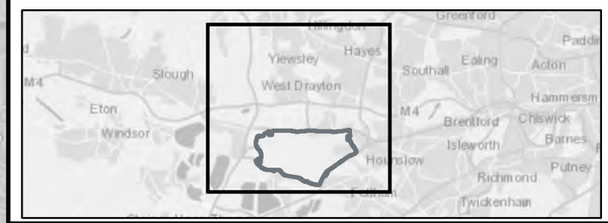
Areas of informal recreation

- Amenity Green Space
- Cemetries and Churchyards
- Green Corridor
- Parks and Gardens
- Play Area
- Semi-natural Green Space
- Waterbody

0 175 350 700 1,050 1,400 1,750 2,100 Metres

Scale 1:35,000

Key plan



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Scale	
1:35,000	
Project Name	Heathrow Project No.
Heathrow Expansion Project	HEP53

Title

Figure 9.3.2: Areas of informal recreation identified within the recreational spaces and routes study area within the London Borough of Hillingdon

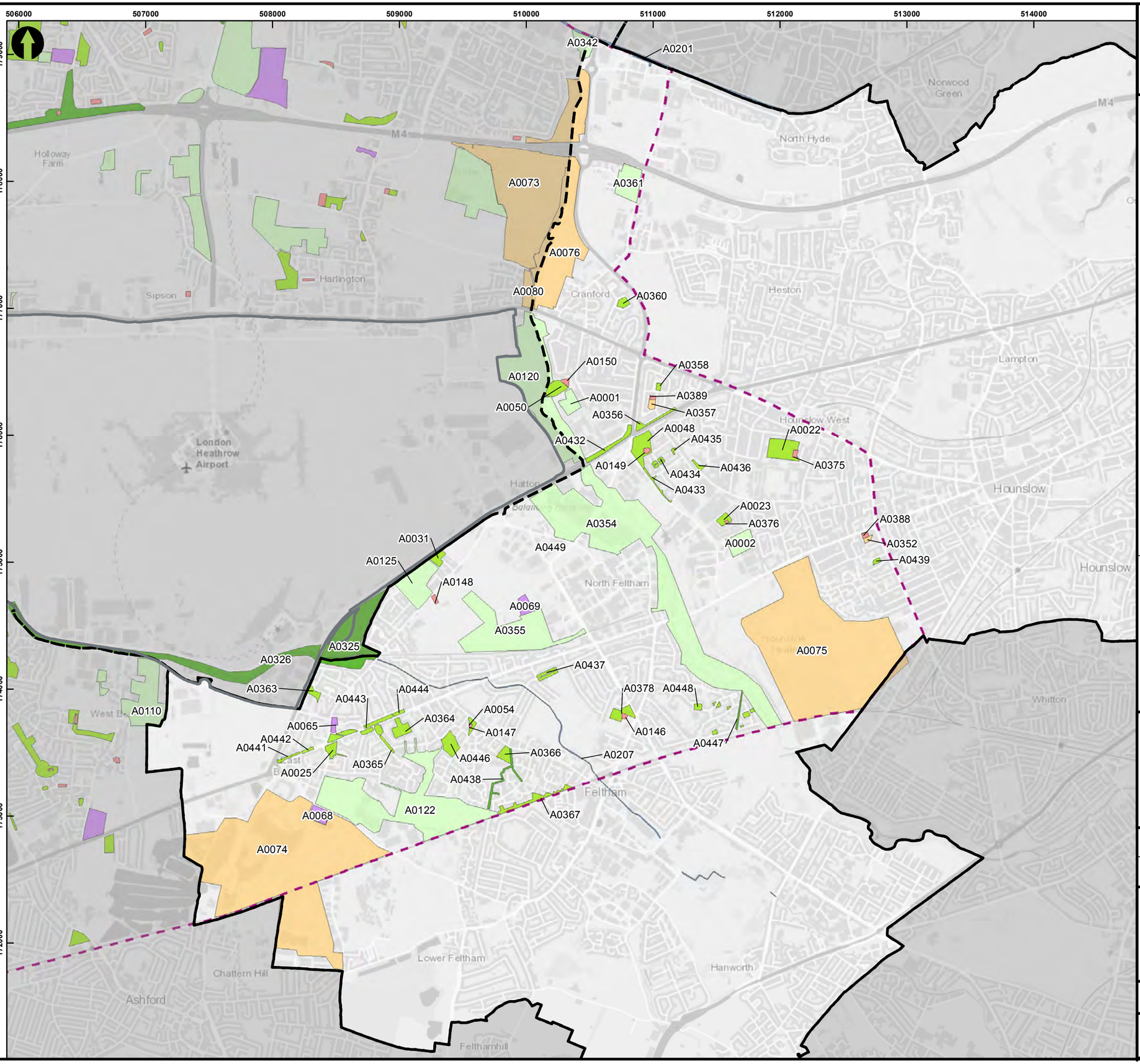
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- Heathrow Planning Boundary
- Recreational spaces and routes study area
- Local Planning Authority boundaries

Areas of informal recreation

- Amenity Green Space
- Cemetries and Churchyards
- Green Corridor
- Parks and Gardens
- Play Area
- Semi-natural Green Space
- Waterbody

0 150 300 600 900 1,200 1,500 1,800 Metres

Scale 1:30,000

Key plan



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Heathrow Expansion Project	HEP53

Title

Figure 9.3.3: Areas of informal recreation identified within the recreational spaces and routes study area within the London Borough of Hounslow

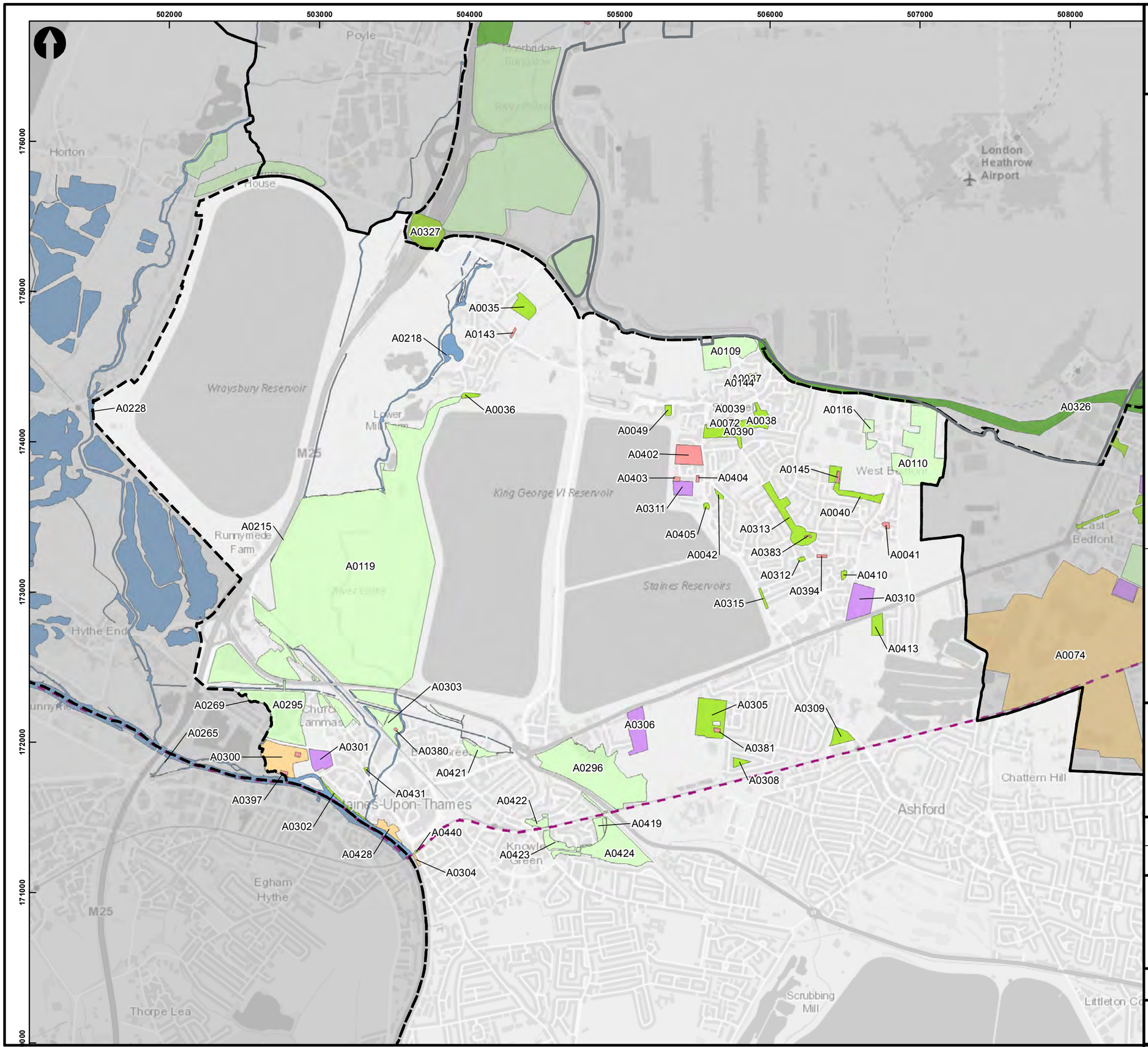
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Heathrow Planning Boundary

Recreational spaces and routes study area

Local Planning Authority boundaries

Areas of informal recreation

- Amenity Green Space
- Cemetries and Churchyards
- Green Corridor
- Parks and Gardens
- Play Area
- Semi-natural Green Space
- Waterbody

0 125 250 500 750 1,000 1,250 1,500 Metres

Scale 1:25,000

Key plan



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1:25,000	Heathrow Expansion Project	HEP53

Title

Figure 9.3.4: Areas of informal recreation identified within the recreational spaces and routes study area within the London Borough of Spelthorne

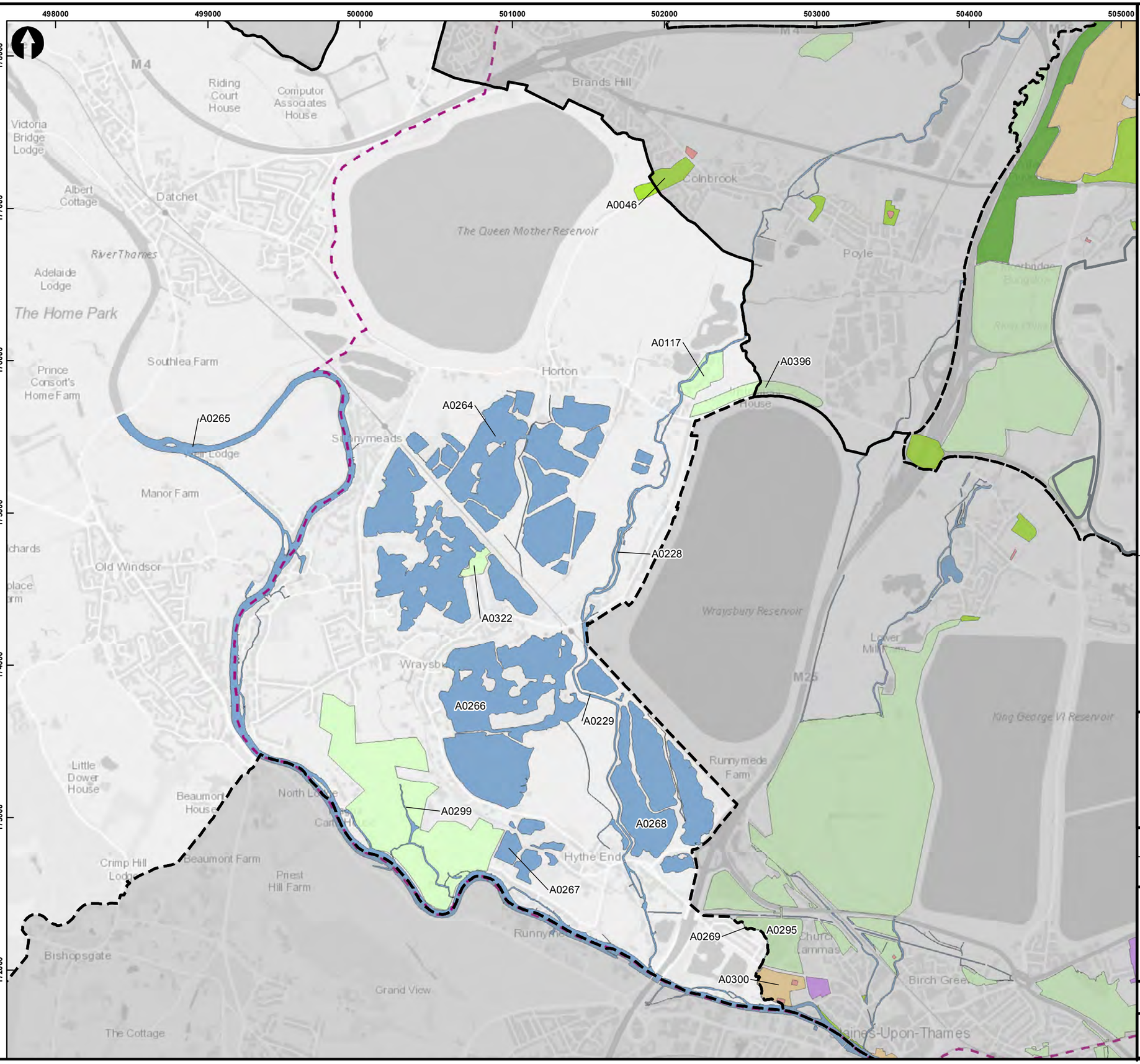
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Heathrow Planning Boundary

Recreational spaces and routes study area

Local Planning Authority boundaries

Areas of informal recreation

- Amenity Green Space
- Cemetries and Churchyards
- Green Corridor
- Parks and Gardens
- Play Area
- Semi-natural Green Space
- Waterbody

0 125 250 500 750 1,000 1,250 1,500 Metres

Scale 1:25,000

Key plan



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Project Name: Heathrow Expansion Project

Heathrow Project No.: HEP53

Title

Figure 9.3.5: Areas of informal recreation identified within the recreational spaces and routes study area within the London Borough of Windsor and Maidenhead

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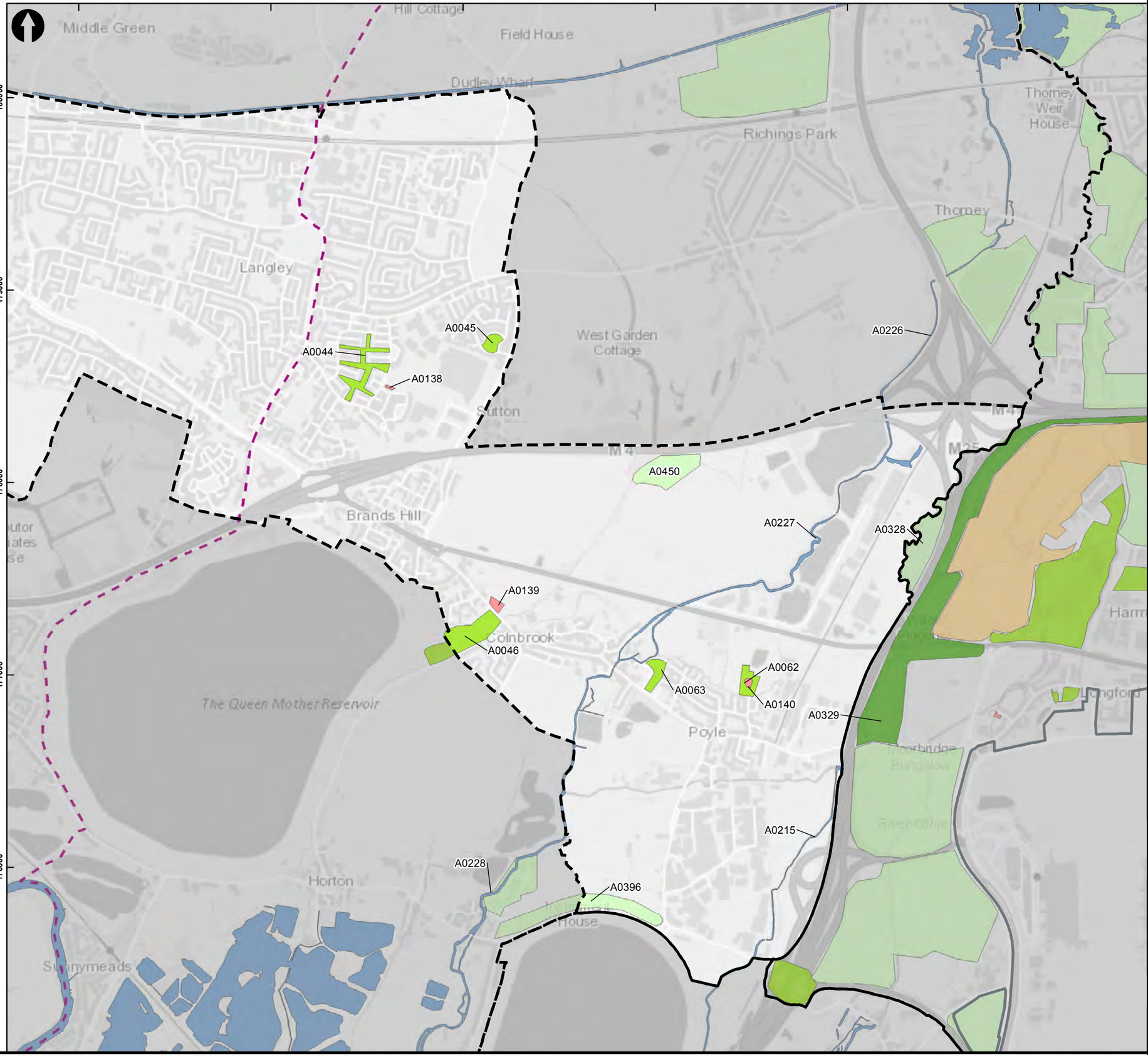
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Heathrow Planning Boundary

Recreational spaces and routes study area

Local Planning Authority boundaries

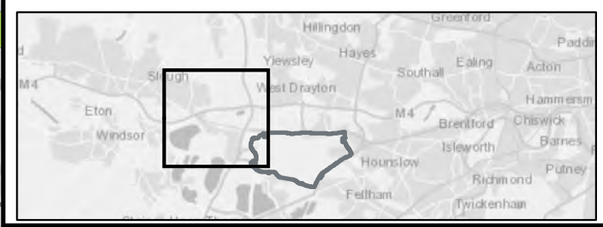
Areas of informal recreation

- Amenity Green Space
- Cemetries and Churchyards
- Green Corridor
- Parks and Gardens
- Play Area
- Semi-natural Green Space
- Waterbody

0 100 200 400 600 800 1,000 1,200 Metres

Scale 1:20,000

Key plan



Heathrow

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Scale	Project Name	Heathrow Project No.
1:20,000	Heathrow Expansion Project	HEP53

Title

Figure 9.3.6: Areas of informal recreation identified within the recreational spaces and routes study area within the Borough of Slough

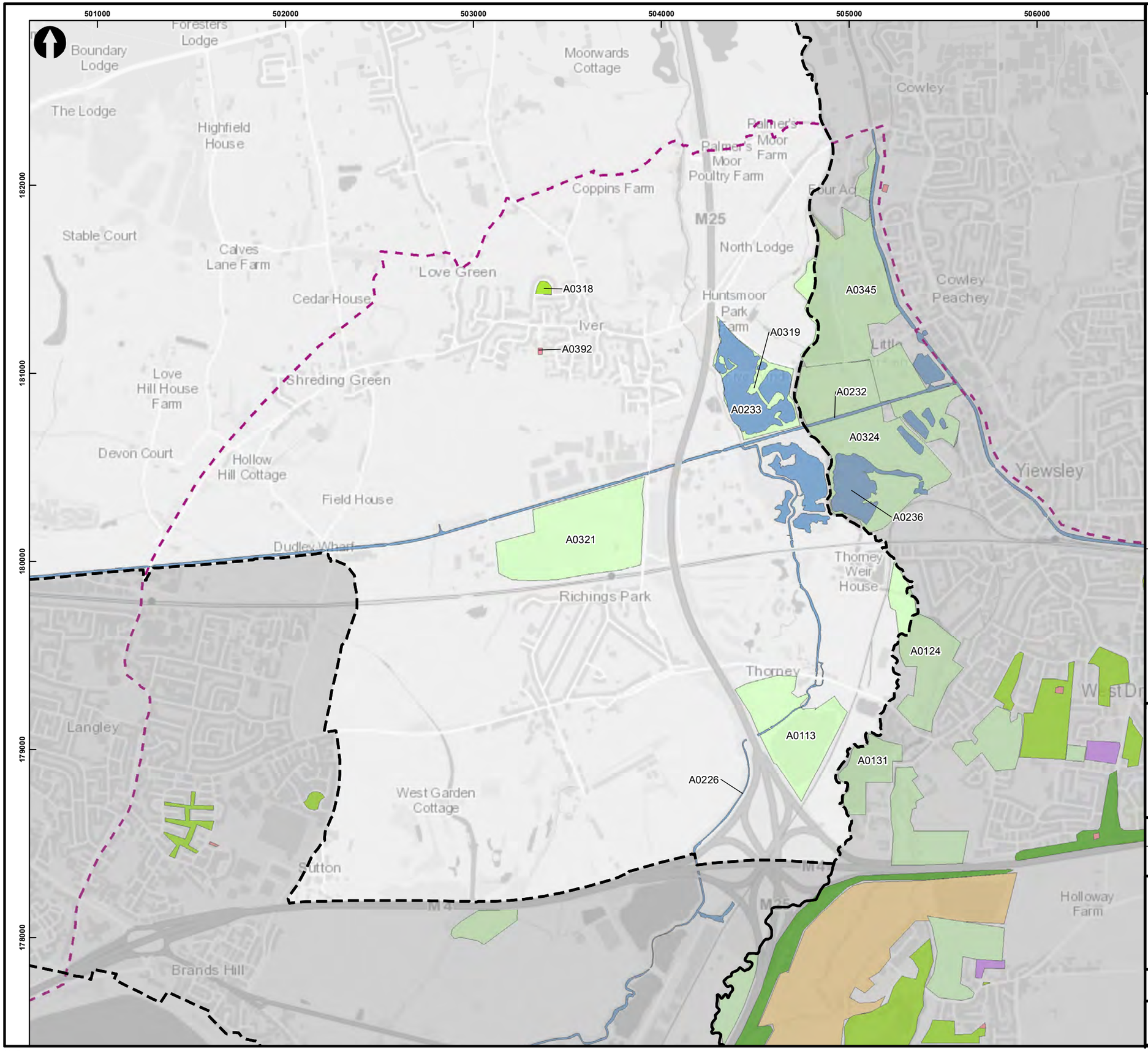
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Heathrow Planning Boundary

Recreational spaces and routes study area

Local Planning Authority boundaries

Areas of informal recreation

- Amenity Green Space
- Cemetries and Churchyards
- Green Corridor
- Parks and Gardens
- Play Area
- Semi-natural Green Space
- Waterbody

0 100 200 400 600 800 1,000 1,200 Metres

Scale 1:20,000

Key plan



Heathrow

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Project Name: Heathrow Expansion Project	Heathrow Project No.: HEP53

Title

Figure 9.3.7: Areas of informal recreation identified within the recreational spaces and routes study area within South Bucks District

Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	GREES	WRIGS	10/05/2018	FINAL

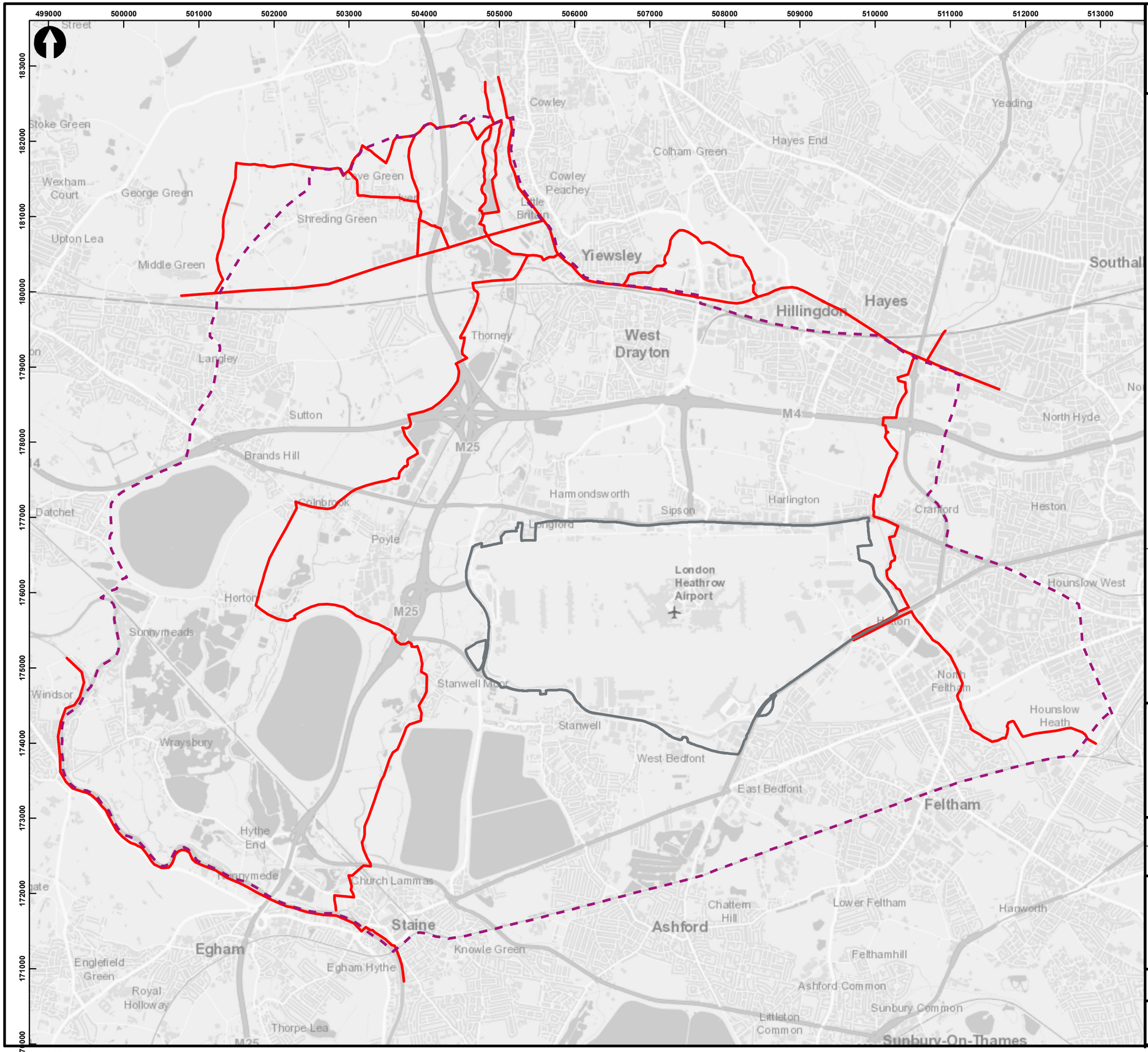
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Heathrow Planning Boundary

Recreational spaces and routes study area

Long Distance Routes

0 250 500 1,000 1,500 2,000 2,500 3,000 Metres

Scale 1:50,000

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1:50,000	
Project Name	Heathrow Project No.
Heathrow Expansion Project	HEP53

Title

Figure 9.3.8: All Long Distance Footpaths identified within the recreational spaces and routes study area

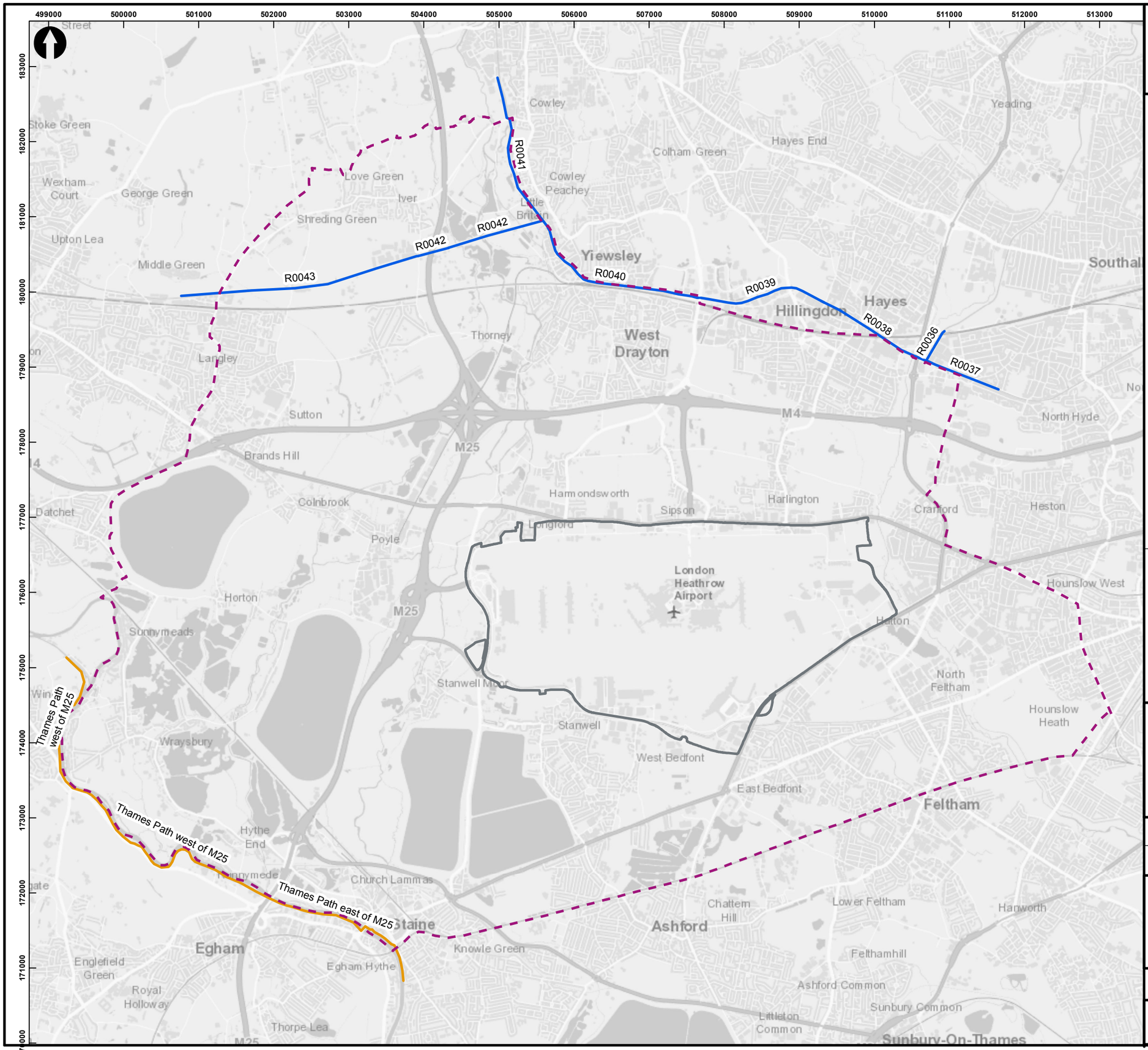
Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	BUTLS	MURRC	10/05/2018	FINAL

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HEP53-XX-GA-XXX-000139	1.0

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Heathrow Planning Boundary

Recreational spaces and routes study area

Grand Union Canal

Thames Path National Trail

0 250 500 1,000 1,500 2,000 2,500 3,000 Metres

Scale 1:50,000

Heathrow

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Scale	
1:50,000	
Project Name	Heathrow Project No.
Heathrow Expansion Project	HEP53

Title

Figure 9.3.9: Thames Path National Trail and Grand Union Canal Walk within the recreational spaces and routes study area

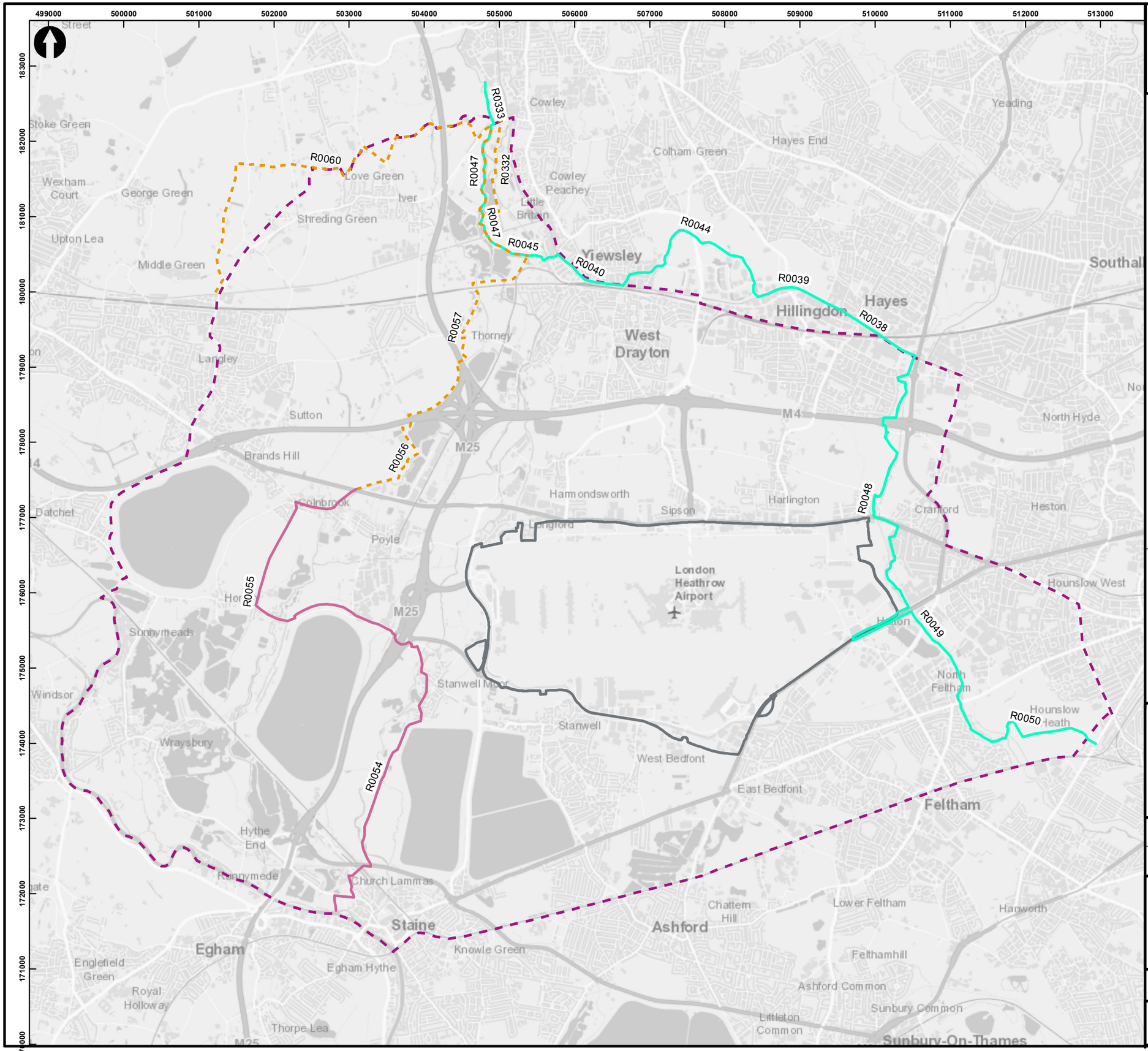
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Heathrow Planning Boundary

Recreational spaces and routes study area

Long Distance Routes

Colne Valley Way

Colne Valley Trail

London Loop

0 250 500 1,000 1,500 2,000 2,500 3,000 Metres

Scale 1:50,000

Heathrow

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Project Name: Heathrow Expansion Project	Heathrow Project No.: HEP53

Title

Figure 9.3.10: Colne Valley Way, Colne Valley Trail and London Loop within the recreational spaces and routes study area

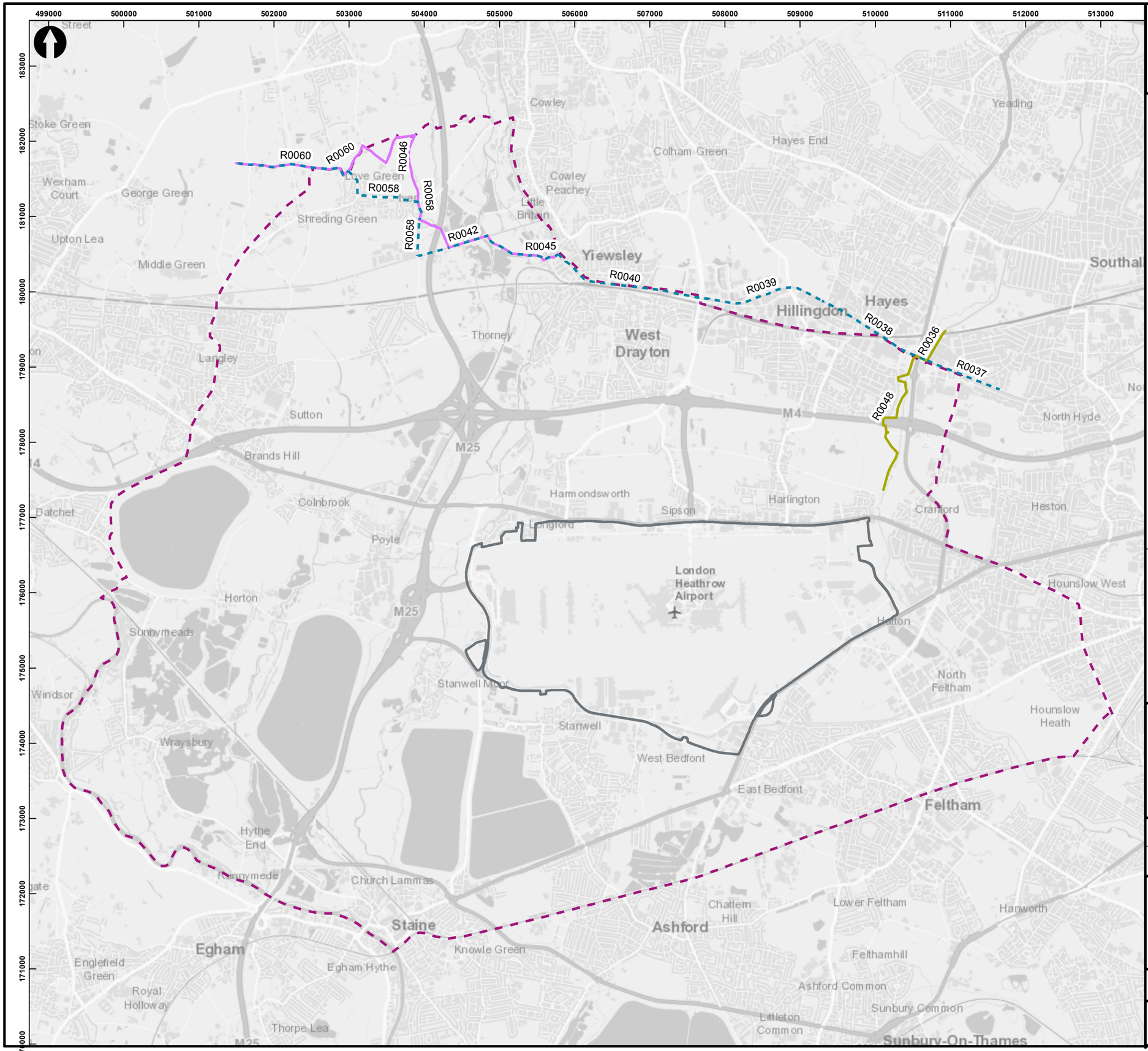
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- Heathrow Planning Boundary
- Recreational spaces and routes study area
- Beeches Way
- Hillingdon Trail
- Shakespeare's Way

0 250 500 1,000 1,500 2,000 2,500 3,000 Metres

Scale 1:50,000

Heathrow

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1:50,000	Heathrow Expansion Project	HEP53

Title

Figure 9.3.11: Beeches Way, Hillingdon Trail and Shakespeare's Way within the recreational spaces and routes study area

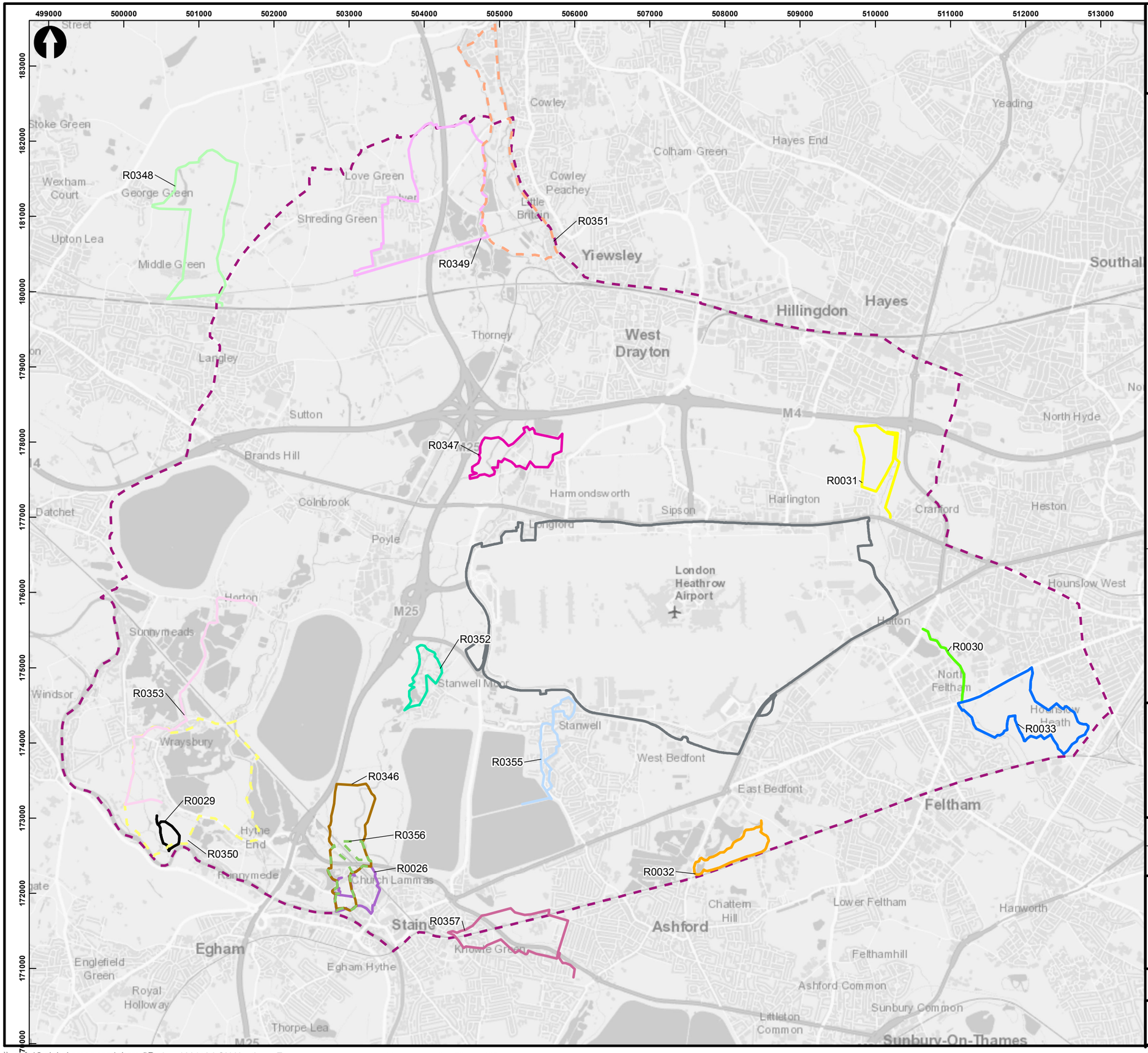
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- Heathrow Planning Boundary
- Recreational spaces and routes study area

Locally Promoted Walks

- Ankerwycke to Runnymede
- Bedfont Lakes
- CVRP Harmondsworth Moor
- CVRP Iver Walk
- CVRP Langley Walk
- CVRP River Colne Walk
- CVRP Staines Walk
- CVRP Wraysbury Walk
- Cranford Park & Avenue Park
- Donkey Wood
- Hounslow Heath
- Lammas Lakes to Staines Moor
- New Route of Section 3 of the Colne Valley Trail
- Spelthorne Church Lammas & Staines Moor
- Spelthorne Fordbridge Park via Bronzefield Walk
- Spelthorne Stanwell Moor & Hithermoor Stream
- Spelthorne Stanwell Village Walk

0 250 500 1,000 1,500 2,000 2,500 3,000 Metres

Scale 1:50,000

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1:50,000	Heathrow Expansion Project	HEP53

Title

Figure 9.3.12: Locally Promoted Walks within the recreational spaces and routes study area

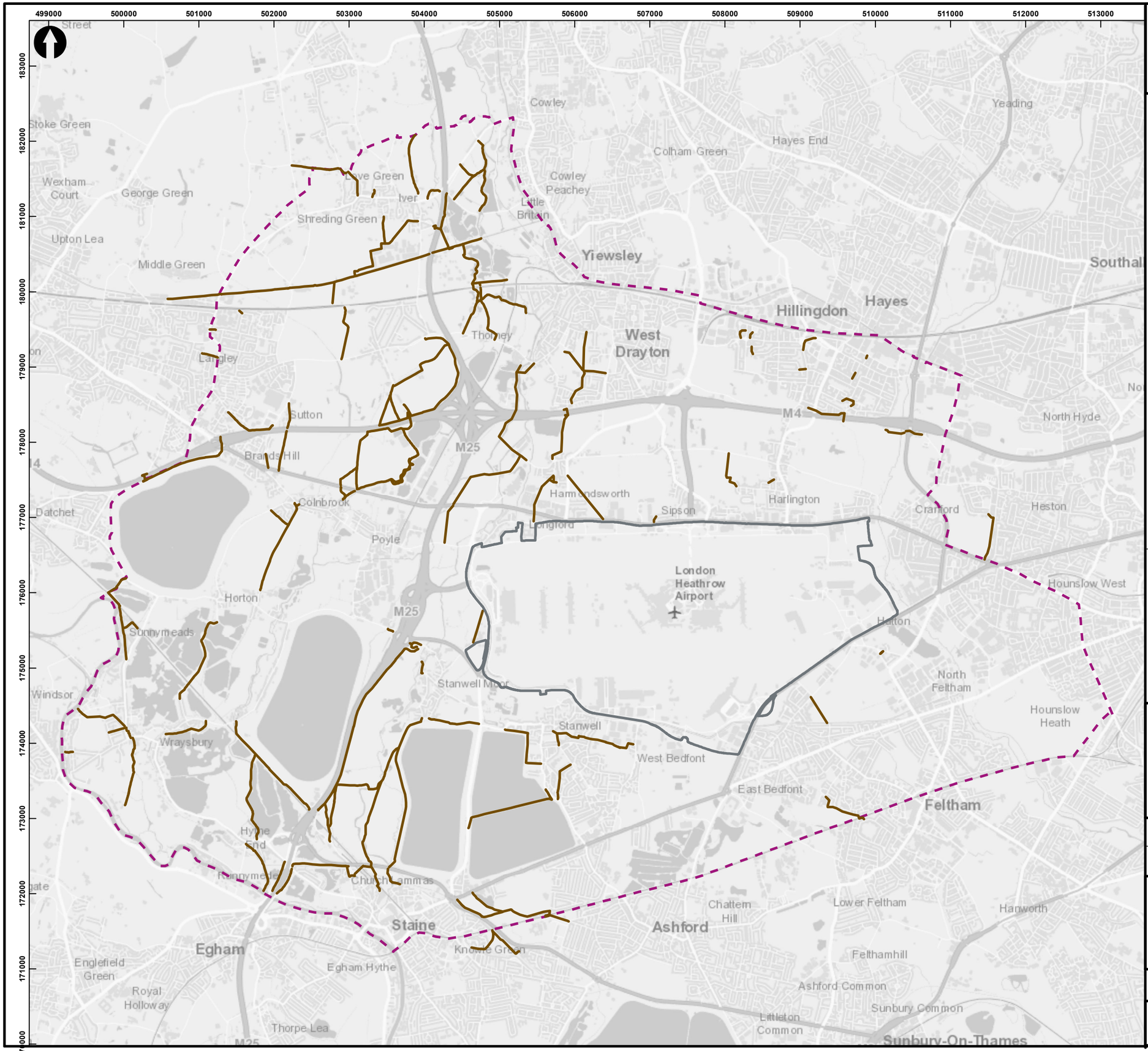
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Heathrow Planning Boundary

Recreational spaces and routes study area

Public Rights of Way

0 250 500 1,000 1,500 2,000 2,500 3,000 Metres

Scale 1:50,000

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1:50,000	
Project Name	Heathrow Project No.
Heathrow Expansion Project	HEP53

Title

Figure 9.3.13: All Local PRoWs identified within the recreational spaces and routes study area

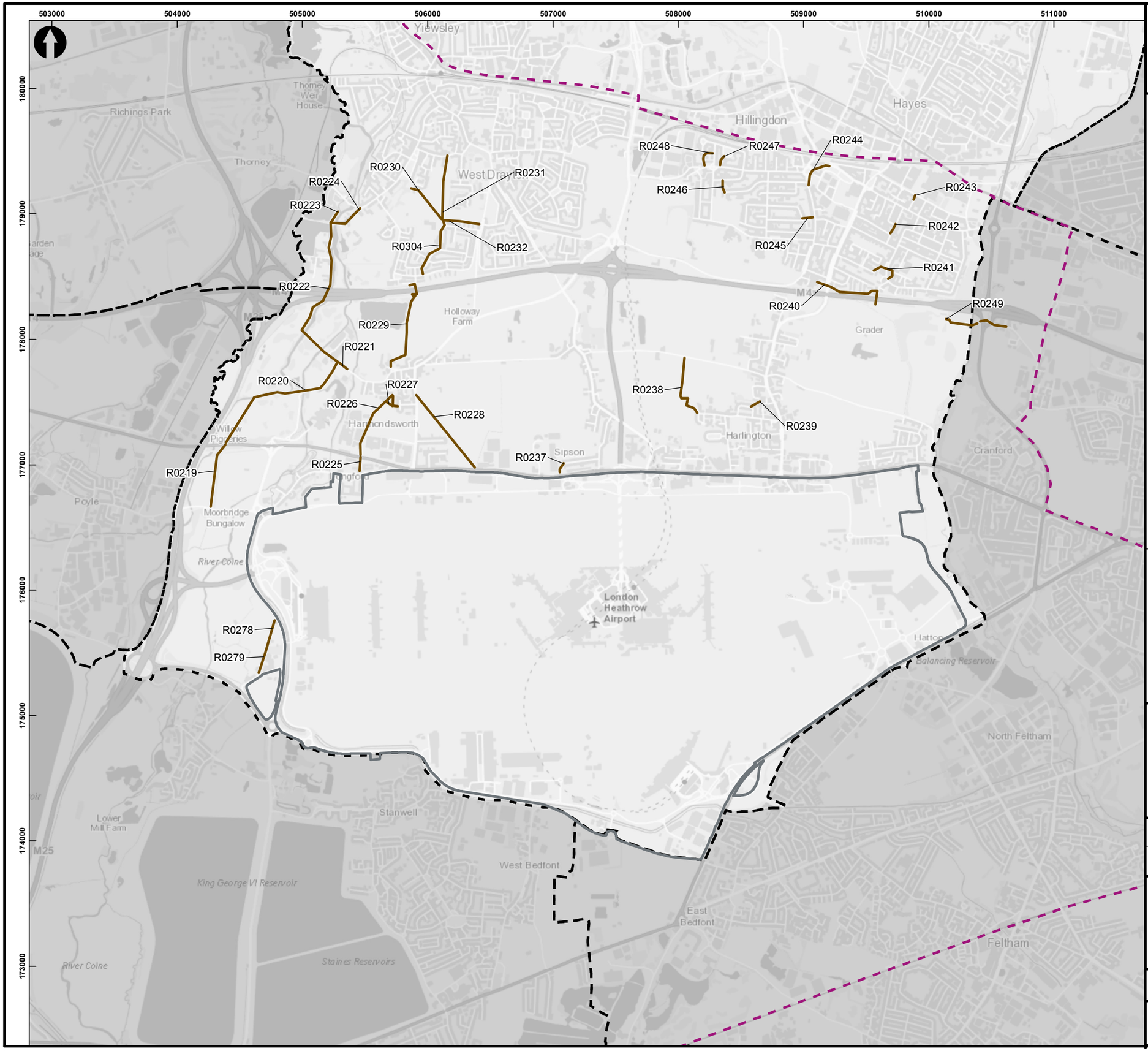
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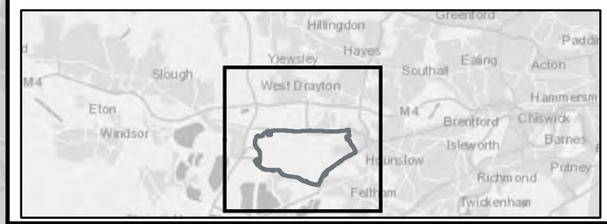
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- Heathrow Planning Boundary
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0 150 300 600 900 1,200 1,500 1,800 Metres

Scale 1:30,000

Key plan



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1:30,000	Heathrow Expansion Project	HEP53

Title

Figure 9.3.14: PRoWs identified within the recreational spaces and routes study area within the London Borough of Hillingdon

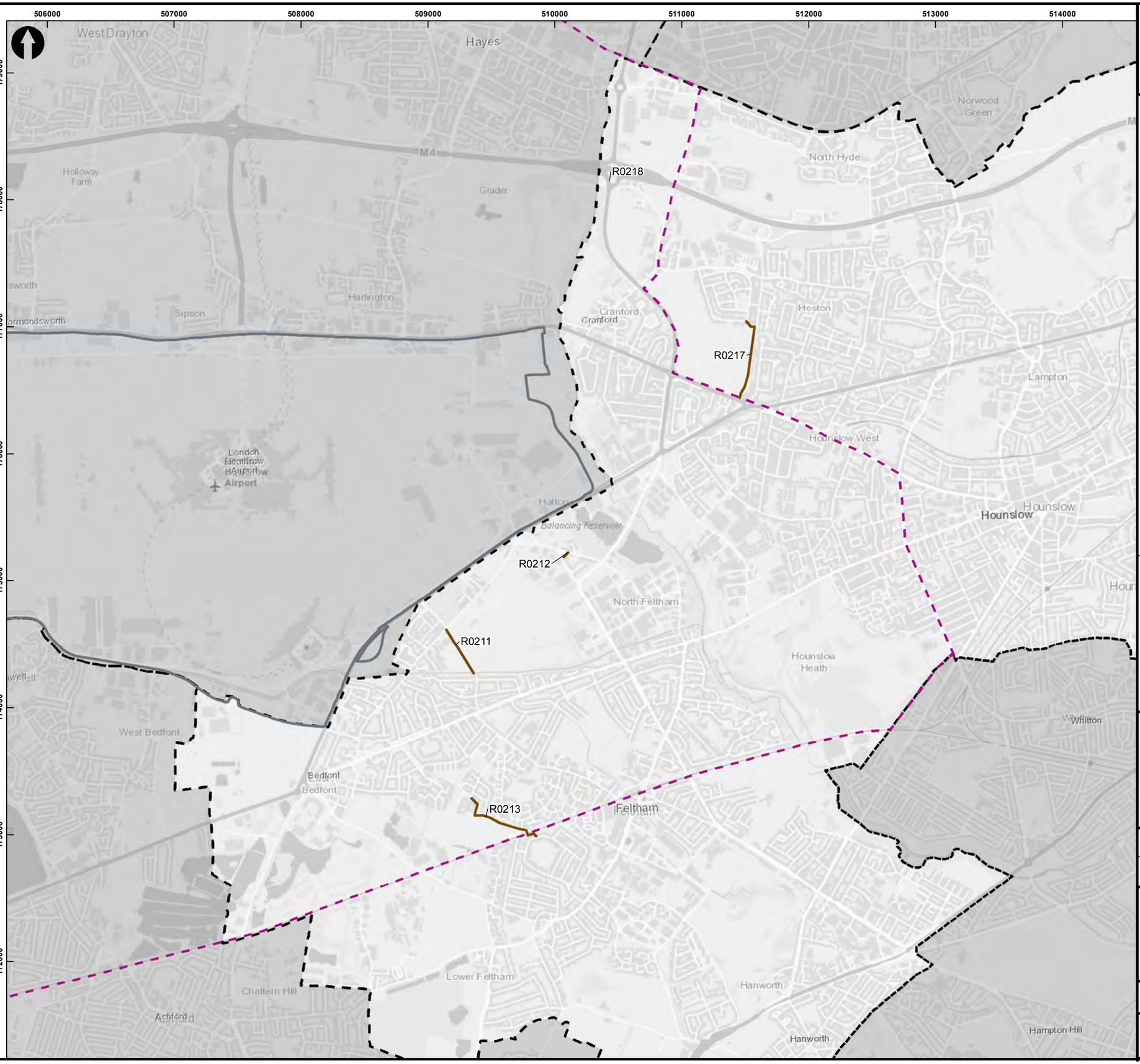
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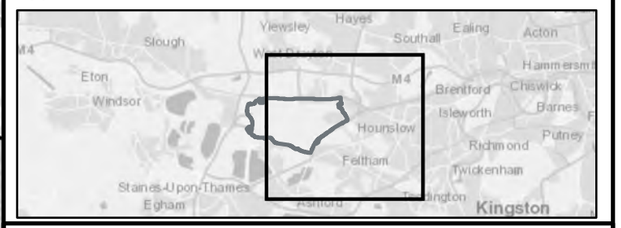
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0 150 300 600 900 1,200 1,500 1,800 Metres

Scale 1:30,000

Key plan



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Project Name: Heathrow Expansion Project	Heathrow Project No.: HEP53

Title

Figure 9.3.15: PRoWs identified within the recreational spaces and routes study area within the London Borough of Hounslow

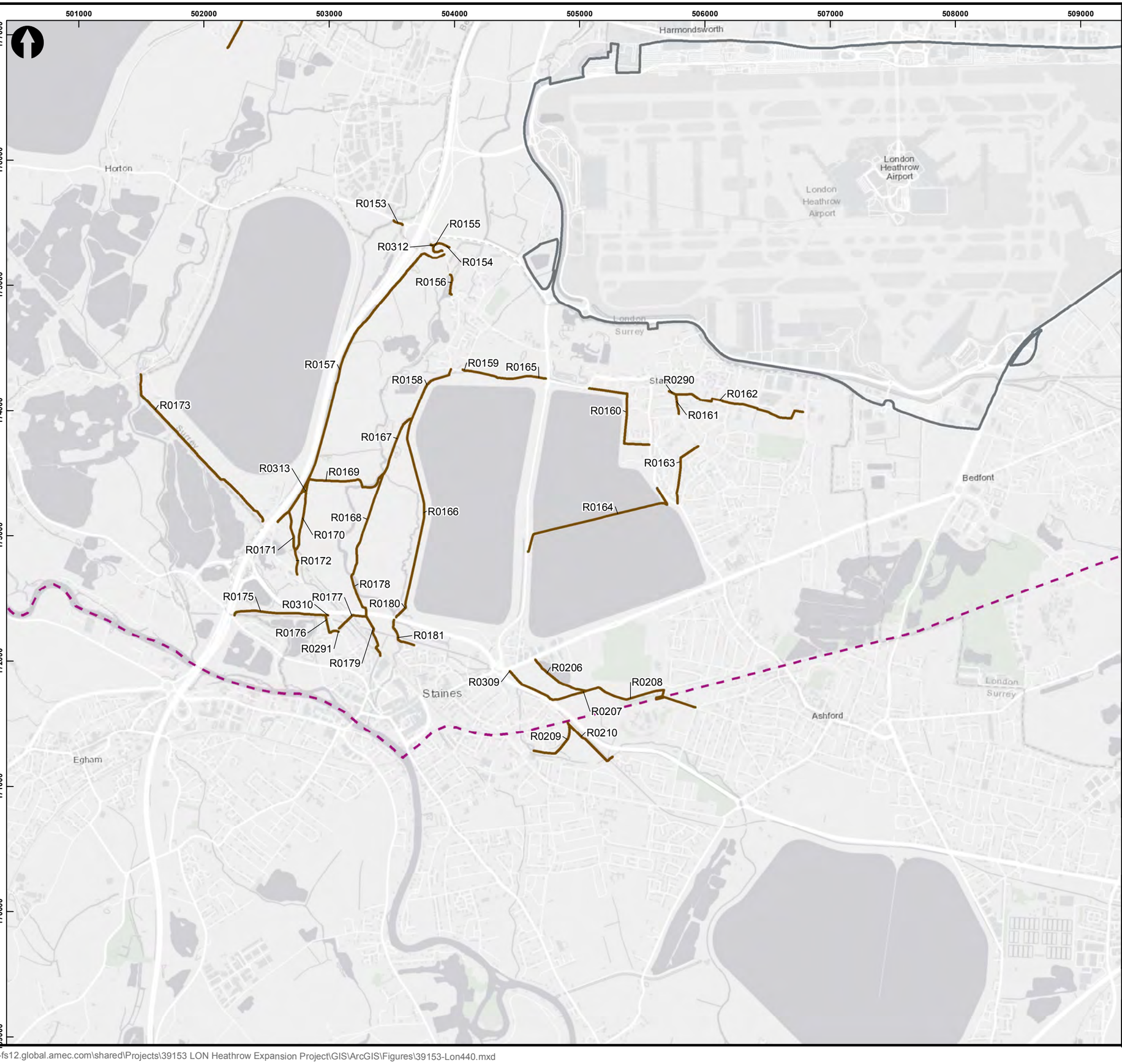
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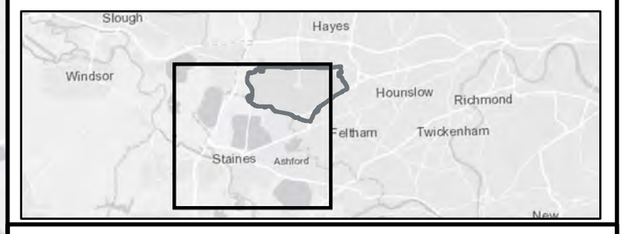
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0 150 300 600 900 1,200 1,500 1,800 Metres

Scale 1:30,000

Key plan



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Title

Figure 9.3.16: PRoWs identified within the recreational spaces and routes study area within the Borough of Spelthorne

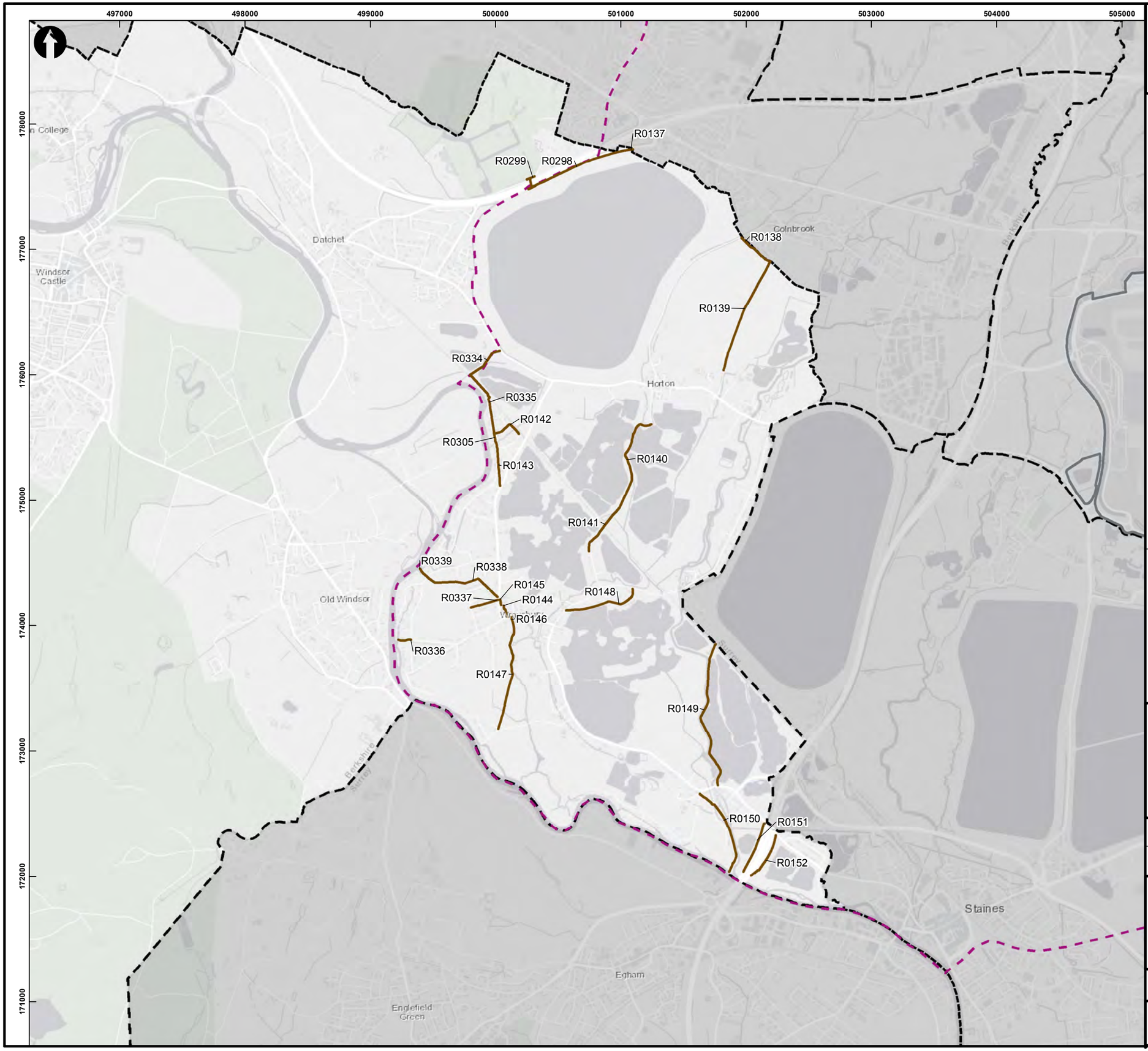
Company	Drawn By	Chk/Approved	Drawn Date	Status
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Location-Level-Sub Series/System-Identifier	Version
HEP53-XX-GA-XXX-000147	1.0

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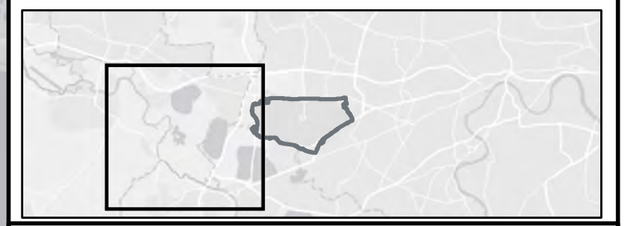
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0 150 300 600 900 1,200 1,500 1,800 Metres

Scale 1:30,000

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Project Name	Heathrow Project No.
Heathrow Expansion Project	HEP53

Title

Figure 9.3.17: PRoWs identified within the recreational spaces and routes study area within the Royal Borough of Windsor and Maidenhead

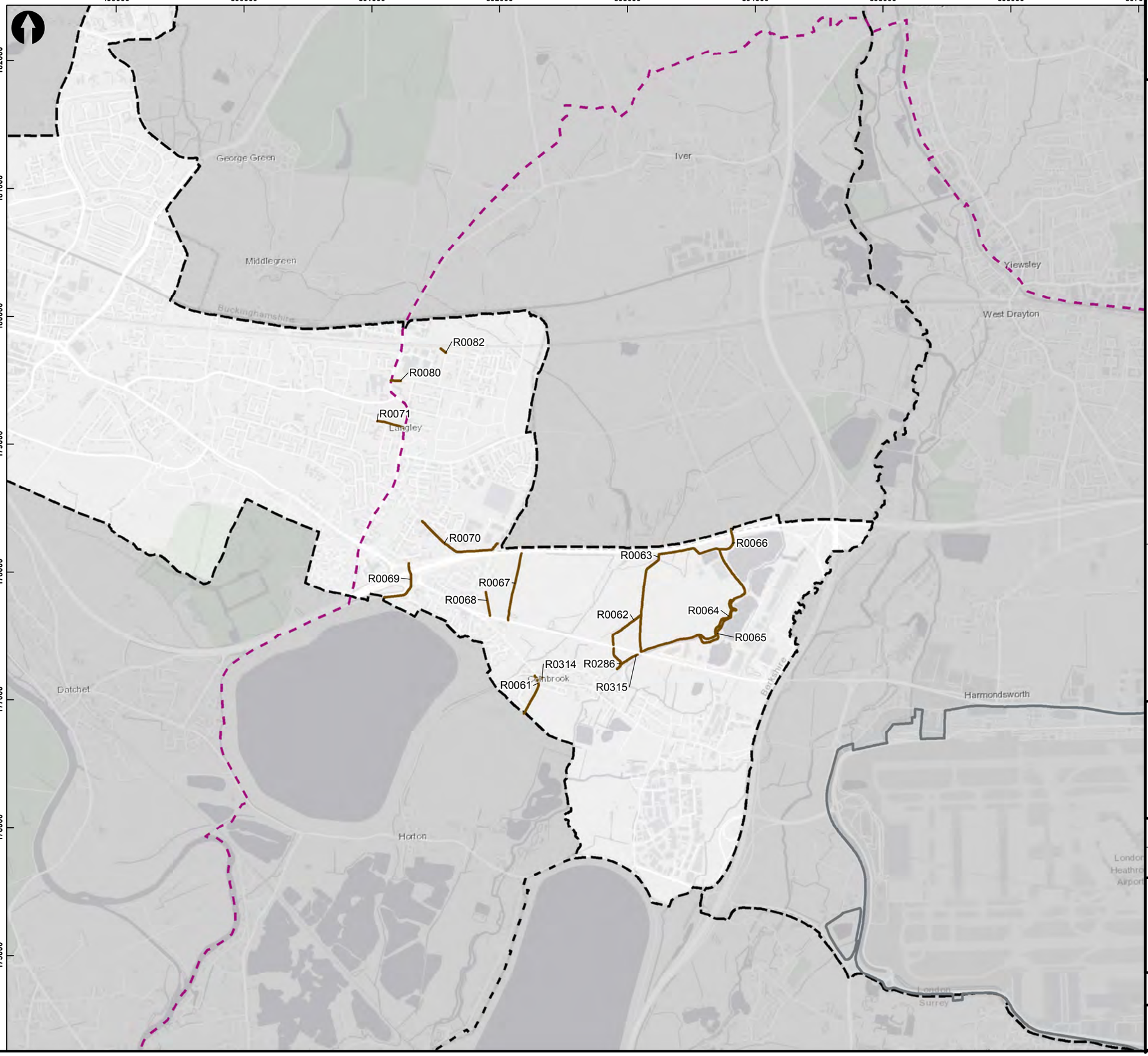
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Heathrow Planning Boundary

Recreational spaces and routes study area

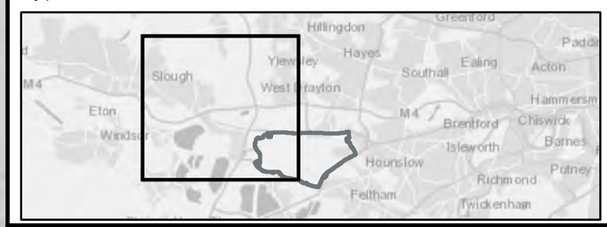
Local Planning Authority boundaries

Public Rights of Way

0 150 300 600 900 1,200 1,500 1,800
Metres

Scale 1:30,000

Key plan



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Project Name
Heathrow Expansion Project

Heathrow Project No.
HEP53

Title
Figure 9.3.18: PRoWs identified within the recreational spaces and routes study area within the Borough of Slough

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Wood	GREES	MURRC	10/05/2018	FINAL

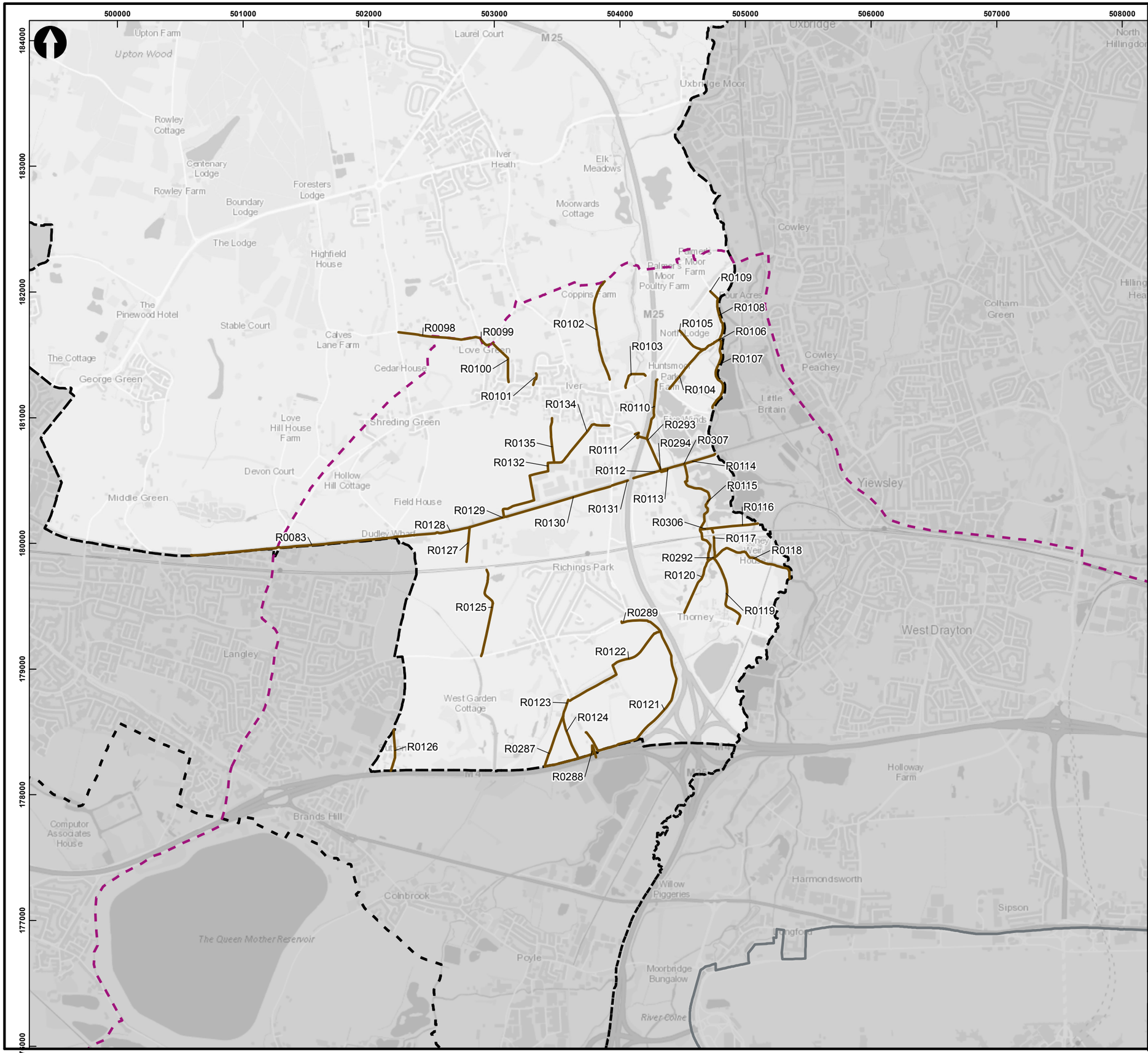
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Version
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Heathrow Planning Boundary

Recreational spaces and routes study area

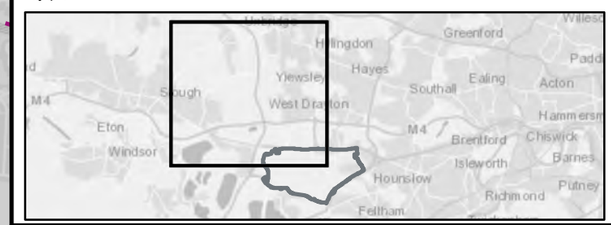
Local Planning Authority boundaries

Public Rights of Way

0 150 300 600 900 1,200 1,500 1,800
Metres

Scale 1:30,000

Key plan



Heathrow

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Title

Figure 9.3.19: PRoWs identified within the recreational spaces and routes study area within South Bucks District

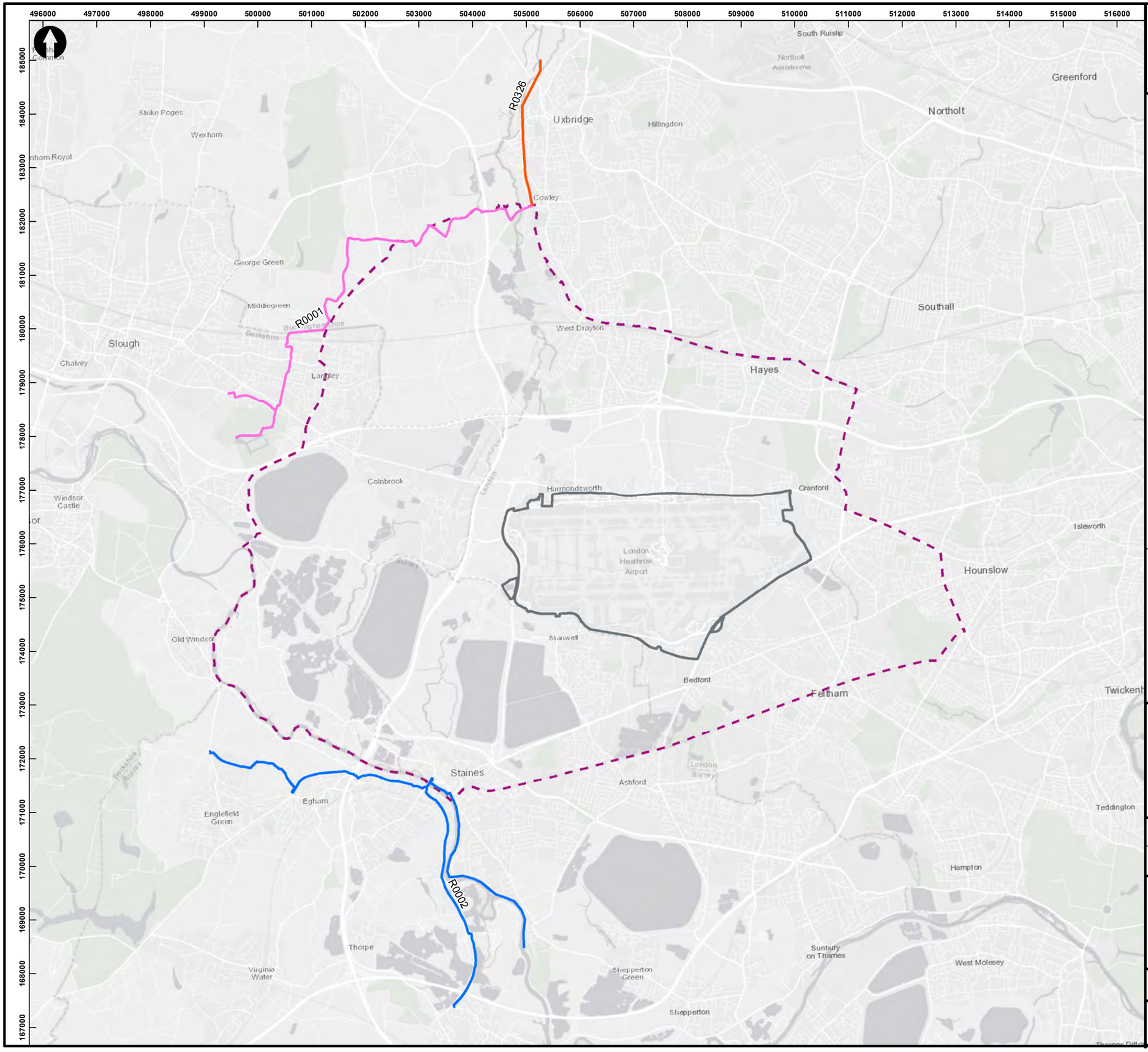
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Heathrow Planning Boundary

Recreational spaces and routes study area

Sustrans National Cycle Routes

National Route 4

National Route 6

National Route 61

0 350 700 1,400 2,100 2,800 3,500 4,200 Metres

Scale 1:70,000

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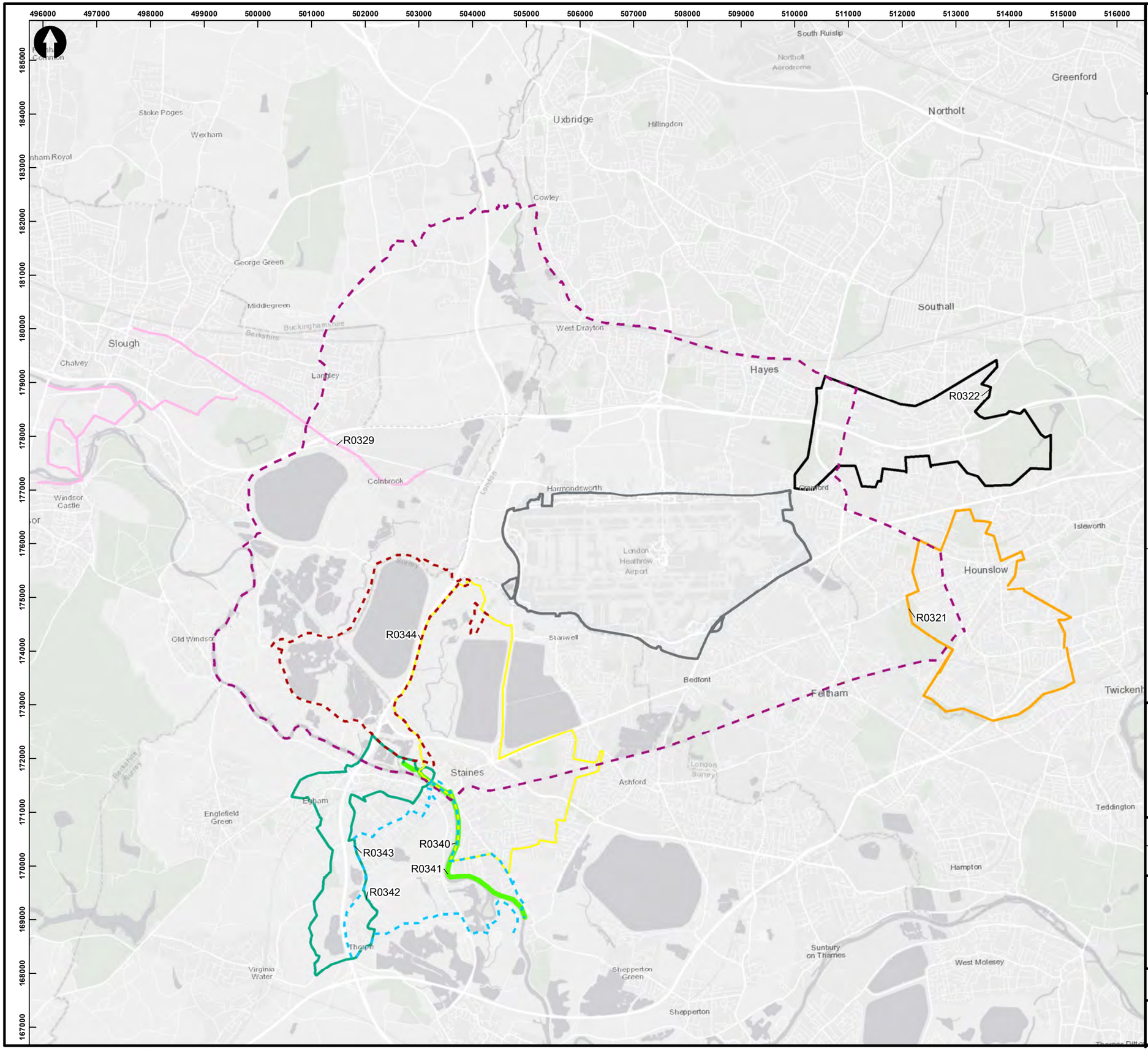
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Heathrow Expansion Project	HEP53

Title

Figure 9.3.20: Sustrans National Cycle Routes identified within the recreational spaces and routes study area

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Heathrow Planning Boundary

Recreational spaces and routes study area

Locally Promoted Routes

- Cranford and Heston ride
- Hounslow Park ride
- Spelthorne Route 1 Ashford to Staines upon Thames
- Spelthorne Route 4
- Spelthorne Route 5 Staines upon Thames to Thorpe
- Spelthorne Route 6 Laleham to Chertsey
- Spelthorne Route 8 Stanwell Moor to Wraysbury to Staines upon Thames
- The Jubilee River & Slough Linear park route

0 350 700 1,400 2,100 2,800 3,500 4,200 Metres

Scale 1:70,000

Heathrow

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Scale	Project Name	Heathrow Project No.
1:70,000	Heathrow Expansion Project	HEP53

Title

Figure 9.3.21: Locally Promoted Cycle Routes within the recreational spaces and routes study area

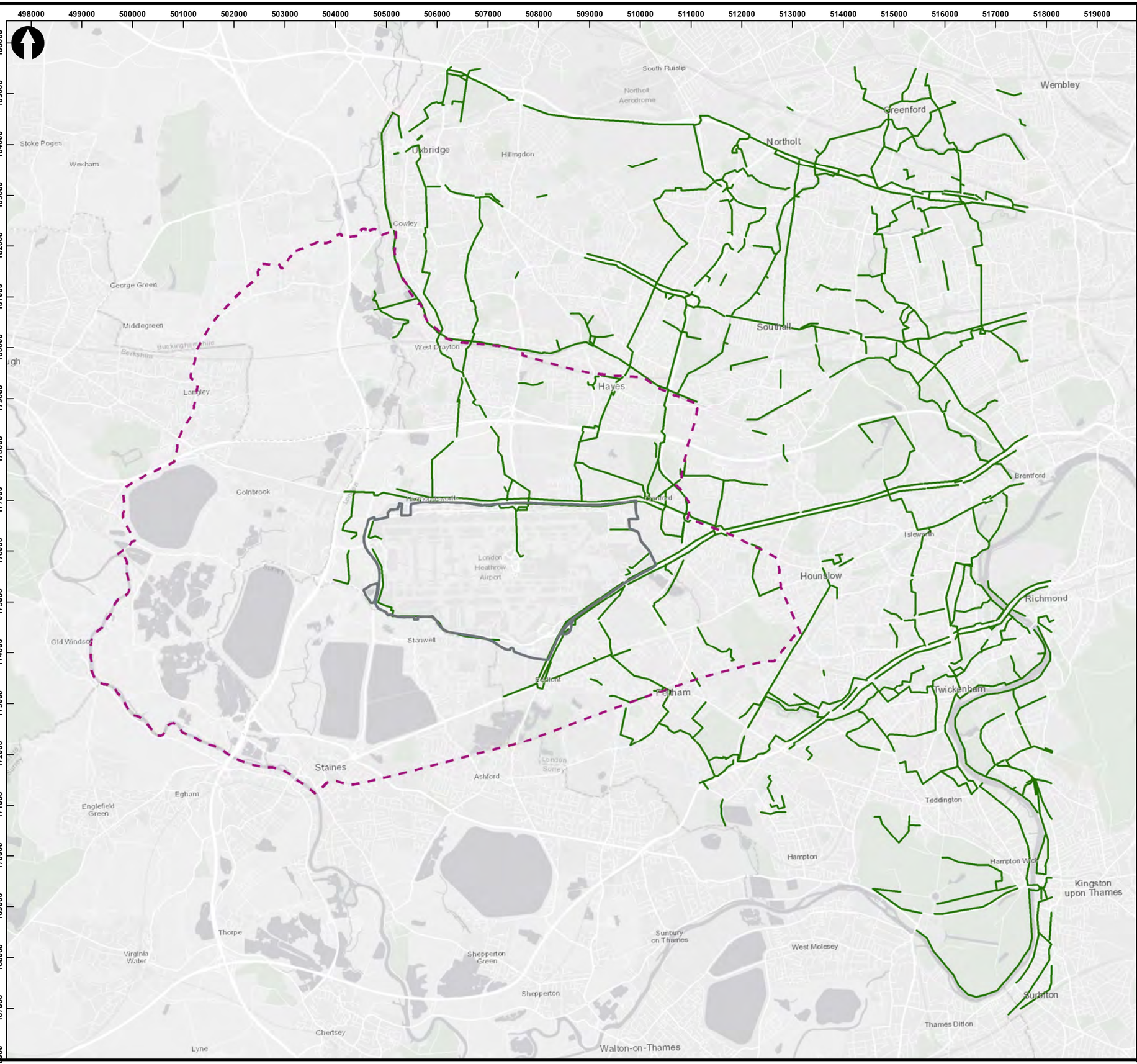
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Heathrow Planning Boundary

Recreational spaces and routes study area

Transport for London Promoted Cycle Network Routes

0 375 750 1,500 2,250 3,000 3,750 4,500
Metres

Scale 1:75,000

Heathrow

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1:75,000	
Project Name	Heathrow Project No.
Heathrow Expansion Project	HEP53

Title

Figure 9.3.22: Regionally Promoted Cycling Network within the recreational spaces and routes study area

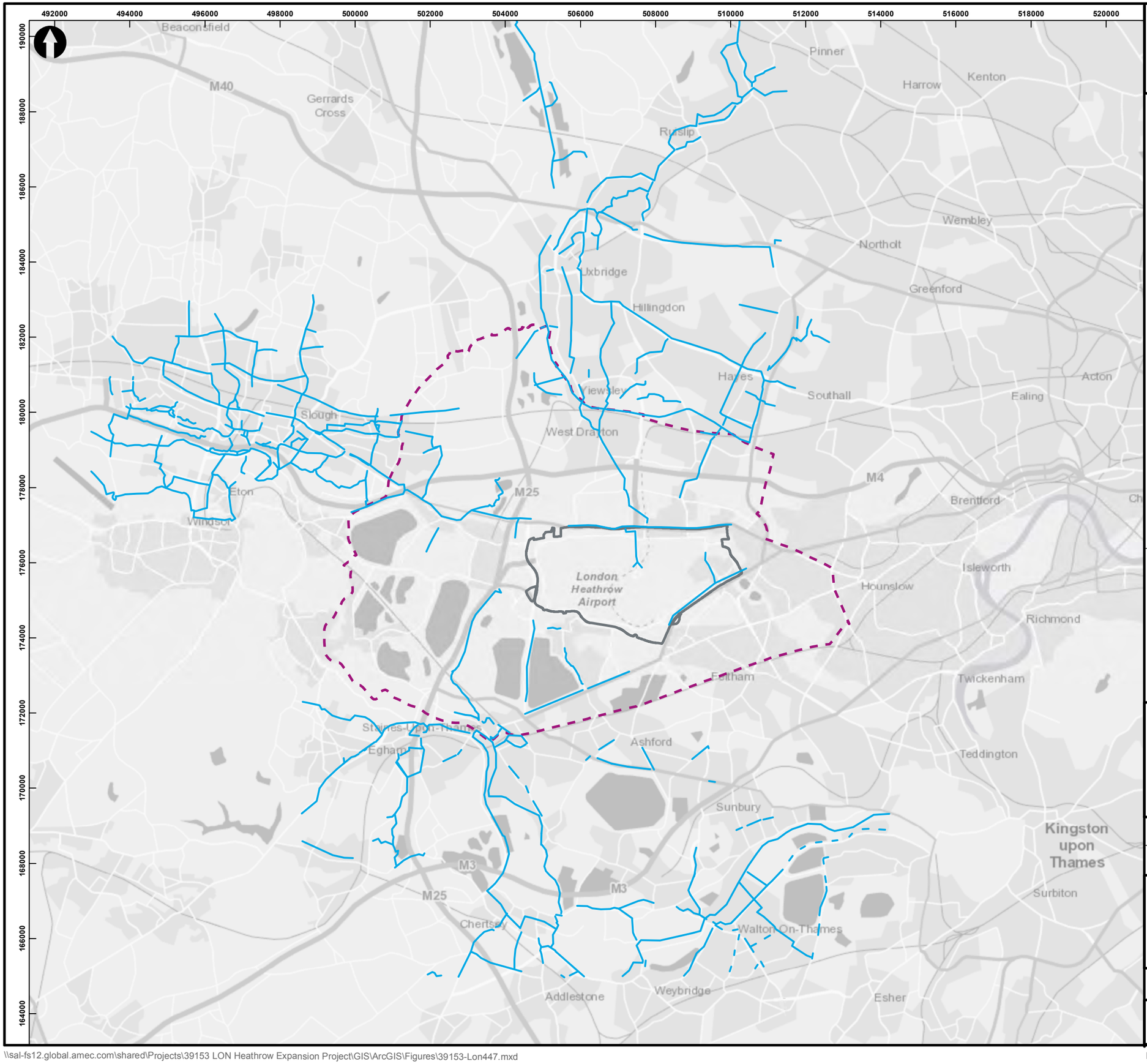
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Wood	GREES	MURRC	10/05/2018	FINAL

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Heathrow Planning Boundary

Recreational spaces and routes study area

Local Cycle Network

0 500 1,000 2,000 3,000 4,000 5,000 6,000 Metres

Scale 1:100,000

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Project Name
Heathrow Expansion Project

Heathrow Project No.
HEP53

Title
Figure 9.3.23: Local Cycle Network within the recreational spaces and routes study area

Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	GREES	MURRC	10/05/2018	FINAL

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Appendix 9.4
Recreational spaces and routes resource attribute table

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1. RECREATIONAL SPACES AND ROUTES RESOURCE ATTRIBUTE TABLE

1.1.1 The baseline conditions at each of the open spaces and routes identified within the recreational spaces and routes study area will be recorded using the following attribute table.

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Heathrow Expansion
Recreational spaces and routes resource attribute table

Proforma Attribute Table

Category	Attribute	Data	Guidance	Included in Desk Study Scope?
Housekeeping / QA	Resource ID		RAIA ID. Either taken from initial master list (e.g. A0001, R0001 etc.)or enter 'NEW' if resource is not on master list. If an area on the master list needs to be subdivided, enter its RAIA ID followed by 'SUBDIVISION'. Use this ID to name both the Excel file and the Worksheet.	Yes
	Resource Name		Enter the name of the resource	Yes
	Level 1 Typology		Pick from drop-down list	Yes
	Level 2 Typology		Enter Level 2 Typology if appropriate (e.g. 'Canal' or 'PRoW Footpath'). Try to be consistent so that collated data can be filtered	Yes
	Quantity		Amount of provision e.g. the area of recreational open space or length of route. State as hectares (ha) or metres (m)	Yes
	Ownership		May be just "Public" or "Private" at this stage	Yes
	Location		e.g. North of Accommodation Lane, west of Harmondsworth	Yes
	Desk Study Undertaken by		Name of researcher (use RESID not full name)	Yes
	Desk Study Date		Date of research	Yes
	Field Survey Undertaken by		Name of surveyor (use RESID not full name)	No
	Field Survey Date		Date of survey	No
	References		List of information sources referred to e.g. web address and access date, publication references etc.	Yes
Functionality	Primary Purpose		Identifying an open spaces' primary purpose in order to assess whether it is 'fit for purpose'.	Yes
	Multi-functionality		Ability to perform various environmental and social functions.	Yes
	Quality		Is the open space 'fit for purpose'? Depending on user needs and requirements and the design and management of the site.	No. Requires field survey and user survey
	Condition		Sate of repair, appropriateness of management regime	Initial opinion from on-line photography. Requires field survey to finalise
	Safety		Safety of infrastructure/facilities and 'furniture' particularly that which is ageing.	No. Requires field survey
Accessibility / Connectivity	Public Accessibility		How accessible is the open space? This should include sustainable access options such as footpaths and cycle paths but also accessibility to children's play space.	Yes
	Proximity to recreational routes		Consider proximity to any paths crossing an open space. List relevant AFW IDs	Yes
	Proximity to other R&A resources		Consider adjancencies, conectivity and wider context. List relevant AFW IDs	Yes
	Barrier /Traffic		Identify if any barriers to entry to an open space i.e. Control of dogs, dog fouling, anti-social behaviour, a perceived lack of information about parks and open spaces, toilet provision, lack of facilities for certain ages, security, no disabled provision/traffic levels can be an impediment to recreational value of open spaces.	No. Requires field survey and user survey
	Access to walking routes		Consider access for all i.e. disability needs etc/ signage/ entrances/ terrain.	No. Requires field survey
Physical Attributes	Grassed Areas		Grassed areas can add social and environmental value.	Yes
	Water Features		Water features can add social and environmental value.	Yes
	Trees		Broad description of available resource	Yes
	Amenities		Lighting, picnic table, toilets, drink fountains, informal sports equipment/outdoor gyms etc.	Only if published information is available
	Walking Infrastructure		Pathways / footbridges etc.	Initial opinion from on-line photography. Requires field survey to finalise
	Dog-related facilities		Waste bins etc.	No. Requires field survey
Biodiversity	Wildlife and Ecology		Wildlife and ecological attributes can deliver social and environmental benefits.	Only if published information is available
Perceptual Attributes	Aesthetics		Attractiveness including the contribution made by adjacent areas/features.	Initial opinion from on-line photography. Requires field survey to finalise
	Other perceptual attributes		Noise, odour, movement etc.	No. Requires field survey and user survey
	Perception of crime		How a space is designed can impact on the perception of crime.	No. Requires field survey and user survey
Miscellaneous	Additional Comments		Enter any other pertinent information or observations	Optional

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Appendix 10.1
Community and Employment/Economic EIA Technical Note (2) for HSPG (May 2018)

This report has already been issued to some stakeholders for their consideration. As such, the report, the description of the development and some of the terminology used reflects the point in time that the report was produced and may differ from that presented in Volume 1 of this Scoping Report

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Community and Employment/Economic EIA

Technical Note (2) for HSPG (May 2018)

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Version	Date	Summary of changes
0.1	05/04/2018	First Draft - submitted to [redacted] (EIAMT) for initial review
0.2	16/04/2018	Second Draft - [redacted] comments incorporated; Part 2 and appendices added for review by HAL [redacted]. Incorporates [redacted] comments.
1.0	19/04/18	Final version for issue

Stakeholders

Name	Role
	Stakeholders are the nominated persons the document is to be issued to

Approved: [redacted]

Role: Defined Role eg "Task Order Principal Designer"

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1. Background and recap

1. This Technical Note follows a meeting (held on 1st February 2018) and accompanying Technical Note (issued 25th January 2018) that provided members of the HSPG with an overview of the proposed approach to the Community and Economic & employment assessments. The previous meeting addressed:

    - Overall approach to socio-economic (Community and Economic & employment) EIA
        - Context of Airports Commission process, and Draft Airports NPS
        - Proposed scope of the community assessment
        - Proposed scope of the economic and employment assessment
        - An adaptive approach to impact assessment

    - Spatial assessment areas:
        - Community
        - Economics and employment

    - Approach to baseline and assessment years

    - Future engagement during 2018.

2. This Technical Note, and the previous one, are part of a series that will inform EIA scoping and the Preliminary Environmental Impact Report (PEIR) to be consulted on during pre-application formal consultation (Phase Two Consultation), and the Environmental Statement (ES) that will be submitted as part of the Development Consent Order (DCO).

2. Introduction and purpose

3. The purpose of this Technical Note and the meeting to be held on 1st May 2018 is to:
    a. Agree the overall approach to socio-economic assessment, including the spatial assessment areas as discussed previously (effectively agree the content of Technical Note 1, unless where amended by comment and response in this Technical Note 2;
    b. Agree:
        i) The types of effect to be assessed by these assessments;
        ii) The sensitive receptors; and
        iii) The approach to baseline.

4. As such, this Technical Note is split into two parts:

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Part 1 provides HSPG members with the Applicant's response to comments received on the previous Technical Note and an update on actions from the previous workshop.

Part 2 seeks to agree an approach to baseline data, sensitive receptors and potential effects within the study areas discussed previously (as amended by Part 1).

5. This Technical Note will be discussed at a meeting on 1st May 2018 that will provide a forum for explanation of details by the Applicant, and feedback from HSPG members. HSPG members will have four weeks to provide comments on this Technical Note.

6. Our intended outcome is to agree the content of Technical Notes 1 and 2 moving forward through and forming part of scoping and onto PIER (in order to limit areas of disagreement or misunderstanding in our Scoping Report in the first instance, and begin to agree the parameters of the assessment). HSPG members will therefore be asked to agree or state disagreement (or suggest additional content) to these Technical Notes.

PART 1

3. Applicant response to comments on Technical Note 1

7. The following table sets out the comments received on Technical Note 1 from HSPG members and provides an Applicant response on each.

Table 1: Summary of response from HSPG on Technical Note 1

Action / comment	Applicant's response
Overall approach to Community / Economics and Employment EIA scope of assessment	
Spelthorne • The scope should be at the appropriate geographical and temporal level for each receptor and resource. • In addition to the areas set out in Figure 1 (in Technical Note 1), the scope could also cover: - Connectivity (looking at how this impacts isolation and community cohesion) - Impacts of the expansion on quality of life - Consideration of the impacts on different groups and cultures - Areas in the north of Spelthorne are occupied by large mineral workings and these are subject to S106 agreements associated with their restoration, with an expectation from local communities to do so. It would be helpful if it was clarified how this will be considered in the EIA in terms of community impacts and amenity.	**Scope by receptor/resource** • The study area will be defined based on the spatial extent of the Project, and its subsequent effects on any receptor. We recognise that the different Community and Economic receptors have different sensitivities to change, and in some cases different catchments. • The inner study area is intended to capture effects on physical facilities; and the wider study area captures effects on wider populations including users of those community facilities and other public services. **Connectivity** • International connectivity provided by the Airport is addressed on a national scale by the revised draft ANPS. Changes to access to/from places, services and facilities around the Airport will be assessed in terms of journey time and route by the Transport Assessment. The Community assessment will undertake a qualitative assessment of the subsequent effects of that on people and the viability of community facilities. **Quality of Life**

	• When effects on amenity or 'quality of life' are qualitative, it is hard to assign significance, but these will be reported and quantified where possible. An in-combination assessment will be undertaken that will set out the qualitative in-combination effects on local communities. • "Quality of Life" is not a single measure – many things contribute to it and these will be assessed throughout the PEIR and ES, not just in this chapter. For example, the Revised Draft ANPS section on noise says that the decision maker will need to consider the effect of noise on quality of life. • HAL is developing a series of measures of Quality of Life under Heathrow 2.0 **Different groups/cultures (Equality)** • The assessment will have regard to the potential inequity of effects and their significance to groups with protected characteristics as identified by the Equality Act 2010. A full assessment of effects on groups with protected characteristics will be in the Equality Impact Assessment which is separate to the EIA. **Changes to land use (restoration)** • Existing planning requirements including restoration orders will need to be addressed by the planning application, and will be factored in to the future baseline (i.e. where there is an agreed expectation that an area would become a community-use in the future, and that community use is effectively lost, an assessment of the significance of that change will be undertaken and mitigation proposed).
Surrey CC • One of the concerns we have is the potential impacts on Stanwell and Stanwell Moor which is not just about the displacement of homes (and currently there seems to be some uncertainty as to this until the various transport options for the M25 and A3044 are decided) and displacement and severance of community facilities. • Potential outcomes, depending on which menu of options ends up in the preferred scheme, suggest that this area could experience much more traffic activity around and through these communities (including freight) which will certainly impact on air quality, or they could be isolated if all local access to the airport and anywhere northwards is prevented by the expanded campus westwards and by the severance of a motorway standard airport access link from the M25 and this could also impact residents in these communities who work at the airport. • We would be interested to learn how these issues will be addressed in the EIA.	**Effects on Stanwell and Stanwell Moor** • The Community assessment will identify any potential significant effects on displacement of or changes in access to/from communities, homes, community facilities and places of work (including the Airport). • Prior to EIA, an evaluation process is being undertaken to influence the design and phasing of the Project design in regard of potential community severance issues. • Other environmental effects will be assessed elsewhere in the ES. The in-combination assessment will set out the non-additive, in-combination effects from other environmental topics (such as air quality) on communities at a local scale (this will include Stanwell and Stanwell Moor). • The health EIA chapter will assess the effect of severance and changes in access between homes and community facilities/services on physical and mental health and wellbeing.
Spatial assessment areas	
Spelthorne • In terms of economic assessment, it is acknowledged that effects may be farther reaching than the area set out in Figure 3 (in Technical Note 1). It is therefore queried whether key transport nodes and corridors, business clusters and travel patterns will be considered and the impacts of the expansion on these. • It could also be useful to distinguish other construction projects taking place in the wider area. This could have knock on effects regarding an available workforce and when	**Economic assessment area** • It is understood that economic effects will be experienced wider than the area within Figure 3 (in Technical Note 1). • HAL and HSPG are working on a study called the 'Joint Evidence Base and Infrastructure Study (JEBIS), which is helping to set areas of Heathrow's economic influence (explained later in this note). • This will include a 'Sub-regional context area' covering a wider area informed by existing markets and functional economic areas and business communities, and policy designations. That area will cover the Berkshire and Buckinghamshire Thames Valley LEPs, the Enterprise M3 LEP and much of west London (the Elizabeth Line West

subsequent community and employment effects occur.	area as defined by the London Plan). The extent of the Core Study Area and Sub Regional Context Area are set out in Figures 1a and 1b appended to this Technical Note. • The effects on transport nodes, corridors and travel patterns will be assessed by the Transport Assessment but will be drawn upon in an economic sense in the economic and employment assessment where relevant. The impact on business clusters and key sectors will be included. **Effect of other construction projects** • There will be a cumulative assessment undertaken as part of the EIA which will identify other projects likely to overlap with the Project (including some NSIPs like the M4 Smart Motorway, and High Speed 2). We are working on an approach to labour supply at a regional and national scale to ensure that demand for people and skills is incorporated.
South Bucks • We were surprised that for South Bucks the area is drawn quite tightly for community effects i.e. just Iver and Richings Park. While these two locations are both within 2-3km of the airport and are likely to receive direct (certainly negative but hopefully positive as well) impacts from the expanded airport in terms of land use proposals – pressure on the Green Belt etc, negative construction impacts and impacts on the communities quality of life – it should be noted other parts of the District may benefit more in terms of improved public transport access to Heathrow and an increase in attractiveness as an employment location.	**Extent of Community study area in South Bucks** • We recognise that wider areas will benefit from the combined economic effects of employment generation and infrastructure improvements, and this is reflected in the scale of the study areas for economic and employment effects (the Core Area and Sub-Regional Context Area). • The Community study area reflects the area that has the potential to be affected by displacement or changes to homes and community facilities and their users, and as such includes Iver and Richings Park as a precautionary measure.
Approach to baseline and assessment years	
Spelthorne • There needs to be a consistent baseline across all of the Local Authorities assessed and where gaps are identified these should be addressed to enable a robust evidence base to be established and minimise disparities. • The EIA should also have regard for the Local Plan progress of each surrounding authority and how plans for growth areas interact with the effects of the airport expansion. • Work being undertaken by Spelthorne Borough Council that could inform the EIA baseline is as follows: - Strategic Housing Market Assessment (2015) - Draft Strategic Land Availability Assessment (2018) - Function Economic Area Analysis (2017) - Local Economic Assessment and Local Economic Strategy (2016/17) - Sustainability Appraisal Scoping Report (2017) - Employment Land Needs Assessment (under production- to be published in late Spring) • These reports are available online on the Spelthorne Borough Council website.	**Consistent baseline** • Our aim is to identify a consistent baseline in terms of demographic data, facilities and stakeholders – we will use published datasets and research where possible, but would welcome sense-checking and additional information where possible from HSPG members to ensure a common baseline. **Local Plans and growth** • The JEBIS workstream will create a joint evidence base for economic and population change (and implications for infrastructure demand) between Heathrow and HSPG members, capturing the differences between a 2R and 3R scenario(s). **Local Authority published research and analysis** • We are grateful to receive this information on local assessments and research that will help inform our EIA and will (along with JEBIS) refer to it where relevant to our assessment.
Runnymede • The main source of evidence for Runnymede Borough will be the evidence documents prepared for the Local Plan plus the Economic Development Strategy and Economic Assessment. All of these documents are available on the Council's website.	

Future engagement	
Spelthorne • Overall, the EIA should draw on the experience and good practice from similar infrastructure projects elsewhere. • It may also be beneficial to align the EIA with the Surface Transport Strategy when available. This will allow socio-economic impacts to be assessed alongside the transport changes, with particular consideration of the impacts on local communities, such as isolation, and also the impacts on the economy and employment. • It would also be helpful if the assessment could set out whether the EIA relates to the DCO alone or the whole airport expansion. There will be significant impacts beyond the 'red line' and it would be helpful if this was set out for clarity. • In terms of officers to interact with, the Strategic Planning team, Environmental Health team, Economic Development team and Leisure team at Spelthorne Borough Council should be able to provide information on specific technical issues and provide stakeholders to engage with.	**Other NSIPs and experience** • We intend to use experience from previous expansion of Heathrow (T2 and T5) as well as NSIPs that identify good practice in terms of socio-economic impact assessments and will include this in our EIA Scoping Report. **Alignment with Surface Access Strategy** • As outlined above, an understanding of community severance effects will be critical to help influence the Project's surface access strategy and is being factored in to the design. • The community and economic and employment assessments will draw on the findings of the Transport Assessment to assess effects on communities and the local economy. **DCO / Airport Expansion** • The EIA relates to the Project – anything included within the DCO. This will be the new runway and on-airport expansion and may include Associated Development and infrastructure. • The core topic assessments in the EIA will assess the DCO development; The Cumulative Effects Assessment will consider development related to airport expansion but outside of the DCO. **Engagement / interaction** • The primary source of engagement will be through members of this EIA sub-group on Socio-economics, but from time-to-time we will require bi-lateral engagement with individual Local Authorities and departments / technical officers within them – this information on key contacts is helpful to aid that.
Runnymede • The Planning Policy department have a comprehensive list of stakeholders in the Borough, and the Runnymede Business Partnership also has a database of over 1,000 companies and holds regular events and sends out a regular bulletin to businesses based in the Borough.	**Stakeholders** • We would welcome access to this database of stakeholders to help inform our assessment and will make contact directly to obtain access. • HAL has an existing list of business and community stakeholders for consultation purposes and engagement and will use OS AddressBase and on-going land referencing to identify commercial property affected but would welcome any information on additional stakeholders – for example where it would aid understanding of local construction or operational supply chain opportunities.

4. Updates to issues raised at previous meeting

8. The following table provides updated information on questions asked of the Applicant at the previous meeting, on which progress has been made since 1st February 2018.

Table 2: Updates – response to questions raised at previous meeting (1st February 2018)

Questions raised by HSPG members at our last meeting (February 1st 2018) and Applicant update (where possible)
What is the status of the Heathrow Community Engagement Board? What other engagement is happening (in addition to statutory consultation)?
Heathrow Community Engagement Board • The Heathrow Community Engagement Board (HCEB) is an independently chaired body constituted to provide the functions of an airport consultative committee for Heathrow Airport (in accordance with Section 35 of the Civil Aviation Act 1982) and the functions of the Heathrow Airport community engagement board (as set out in the draft Airports National Policy Statement). • The HCEB was established following a recommendation by the Airports Commission to ensure airport stakeholders, local authorities, communities, passengers and interest groups can contribute effectively to the planning process for the proposed expansion of the airport • On 4/4/18, HCEB announced Rachel Cerfontyne as its new Chair. A selection panel made up of representatives from the new HCEB, Heathrow, the Department for Transport and a local resident group unanimously agreed that Rachel Cerfontyne would provide the necessary open and independent leadership to evolve the work of the new Board and represent the interests of all communities associated with Heathrow Airport. • The first meeting of the HCEB, which is open to the public and media, occurred at 2pm on Wednesday 18th April 2018 at the Heathrow Academy **Listening Events** • Heathrow has set up a series of 'listening events' with communities around the Airport. These are intended to gain insight into the key factors that local residents consider most important about their communities (such as community facilities), and to identify concerns and perceptions about the airport that will help us to ensure we have identified (and given sufficient weight to) sensitive community receptors. • To date, events have taken place in a number of communities around the airport including Stanwell/Stanwell Moor, Colnbrook/Poyle and Harmondsworth. • Feedback from these sessions will inform Heathrow's masterplan and assessment of environmental effects on sensitive receptors. It will enable HAL to fully understand local sensitivities and therefore help direct mitigation or enhancement/implementation strategies where effects can't be avoided through embedded mitigation or design changes. • Through the sessions we want to: o understand what is important to the communities who live in the neighbouring villages, and will be impacted by our expansion proposals o hear from them about their aspirations, fears and concerns o understand what they feel is good/not good about where they live and its proximity to the Airport o understand what if any opportunities they feel an expanded Heathrow could bring to the area o ensure they feel heard and are given a voice in shaping the changes that will affect them. **On-going liaison with key stakeholders** • Alongside the formal consultation process, Heathrow Airport Limited continues to engage with local community facilities - such as schools and other education, skills and training providers, businesses and business groups, key vulnerable facilities like Heathrow Special Needs Centre and nurseries to understand the issues currently being faced by these key facilities.
What progress has been made on the Joint Evidence Base and Infrastructure Study (JEBIS)? And how does it influence the EIA assessment of Community and Economic & Employment effects?
• HAL (and Quod and Arup) have been meeting regularly with HSPG to set the scope of JEBIS. As of the date of issue of this TN, three workshops have occurred along with regular conference calls. • To date, the following have been discussed and agreed:

- **Stage 1a – Study areas** – a Technical Note has been circulated, reviewed and agreed that sets the spatial study areas for the project. These wider study areas will be used as the basis for EIA data collection and assessment of effects on employment, skills and the labour market generally.
- **Stage 1b and 1c - Growth Scenarios –** A review has been undertaken of published economic needs assessments and employment land reviews from HSPG members. The main data sources and assumptions for the study have been subsequently agreed. Several assessments and forecasts of employment effects have been undertaken through the AC process – including by HAL and by DfT – these have been collated and reviewed.

- Next steps (**Stage 2**):
  - Confirm employment scenarios and data points
  - Disaggregate employment impacts by Type, Broad SIC and Location
  - Test 'additionality' against base trend OE data
  - Input 'additional' jobs by SIC, Location and Timing to OE model
  - 'Combined Forecast'
- Stage 3: Implications for Economic Development and the Labour Market
- Stage 4: Housing Growth and Implications for SHMAs

Stage 5: Infrastructure Requirements

How will the 'future baseline' be accounted for?

- As far as possible the assessment will aim to reflect the dynamic nature of the socio-economic environment by using future population and economic projections, identifying planned interventions or new developments and/or identifying sensitivities to change, in order to consider the effects of the Project on local communities, public services, community facilities, labour markets and the economy in the future compared to today.
- These population and economic projections will be primarily drawn from the JEBIS workstream (which has reviewed all existing published information at Local Authority scale, and jointly commissioned projections and scenarios from Oxford Economics).
- We are also working with Transport and Noise teams, which have their own guidance/standards for the use of future baseline information, to ensure that assumptions are consistent across the EIA.

What changes have been made to the study areas based on comments received from HSPG and progress of JEBIS?

Community (See Figure 2appended)

- Following feedback from our last session, the 'Hounslow' community area in the inner study area presented previously has been split into smaller areas to reflect the different and finer-grained socio-economic and housing characteristics within it.
- This figure also shows the area for assessment of effects on recreational spaces and routes, which has been set in principle via a parallel HSPG workstream.

Economic & Employment

- Following feedback from our last session, and on-going work on the JEBIS project, the wider study area has been split into two areas (see Figure 1a and 1b appended):
  - A **core study area** - defined as a specific Heathrow 'catchment', reflecting the immediate area where the greatest employment and property effects are likely to be felt. This is effectively considered the overall Functional Economic Market Area (FEMA)[1]. It is based on local planning authorities with membership of HSPG, but has been validated by comparison to ONS Travel to Work areas and FEMAs established by each individual local planning authority, which cover broadly the same area
  - A **sub-regional context area** - to be used as a basis for analysis of the labour market and wider property needs/impacts. The main function of this sub-regional area will be to provide an economic baseline and to consider its capacity to meet the 'wider' Heathrow generated growth. It is comprised of the 'Elizabeth Line West' area identified by the draft New London Plan, three LEP areas (Thames Valley Berkshire, Enterprise M3 and Buckinghamshire Thames Valley).
- A Heathrow 'commuting area' for consideration of where directly employed labour and labour around the site will be drawn – this will be based on modelling of accessibility to Heathrow by the potential construction and operational workforce.

What is the scope of the 'In-combination' assessment of environmental effects on communities?

- Community effects may arise where there is an accumulation of effects from other environmental topics. These effects may occur both simultaneously and sequentially. The key requirement is to identify whether combined effects on particular locations, resources or receptors may give rise to any new or more significant effects. There is no established method for comparing non-additive, in-combination effects from a range of environmental topics and so professional judgement will be used. This assessment will be drawn upon and informed by the

[1] MHCLG Planning Practice Guidance recommends assessment via 'Functional Economic Market Areas' (FEMAs). These are areas within which there is a relatively self-contained labour market, business market or local economy and may be in part determined by administrative areas and travel-to-work patterns. They are often comprised of Local Enterprise Partnerships (LEP) (groups of public bodies and business representatives in a spatial area), administrative boundaries like local planning authorities, travel to work areas (Office for National Statistics (ONS) defined areas with a relatively self-contained workforce), catchments of facilities, and flows of goods, services and information

Community assessment (but will be reported separately in the Preliminary Environmental Information Report / Environmental Statement).

PART 2

5. Baseline, sensitive receptors and type of effects

9. As set out in Technical Note 1, initial desk-based research is being carried out to collect statistical information about the demographic, economic, and housing characteristics, and community facilities within the study areas. This will be presented within the forthcoming Scoping Report for each scale of study area and will form the source of current baseline information on which the community and economic and employment assessments will be based.

5.1. Baseline

10. The assessment will draw on public datasets at all available spatial scales to set the baseline - this will include National Statistics (ONS), and local published assessments as directed by Local Authorities (including those identified through our previous meeting and responses received). The following table summarises the key sources of data that will be used:

Table 3: Socio-economic data sources

Source	Data
Community	
Office of National Statistics www.nomisweb.co.uk	Including (but not limited) to National Statistics and datasets such as Census (2011) and the Annual Population Survey (2017)
Ordnance Survey (OS) data www.ordnancesurvey.co.uk/business-and-government/products/vectormap-local.html	Including VectorMap and other OS open products to identify land use, property and community facilities
Online maps and aerial photograph resources http://maps.live.com www.magic.gov.uk	Resources include GIS datasets for planning constraints and definitions of public open space
Sports England dataplatform.activeplacespower.com	Including Active Places database of sports facilities
Studies from Local Authorities, Local / Regional Government and other Public Bodies including www.hillingdon.gov.uk www.spelthorne.gov.uk www.hounslow.gov.uk www.southbucks.gov.uk www.slough.gov.uk www.buckscc.gov.ukwww.buckscc.gov.ukwww.buckscc.gov.ukwww.buckscc.gov.uk www.surreycc.gov.uk www.colnevalleypark.org.uk	Strategies, assessments and other published evidence relating to community life and social cohesion, local provision of community facilities including sport and leisure, public services, and housing Published open space strategies and assessments including relevant open space standards Land use surveys Publicly available user surveys capturing usage data for any recreational spaces and routes Public Rights of Way definitive maps

Www3.rbwm.gov.uk www.london.gov.uk	
Local Plans and the London Plan	Standards for provision, and designations of land uses and community facilities such as play areas and allotments
Economic & Employment	
Office of National Statistics (Accessed via: www.nomisweb.co.uk)	Census data (2011) Department for Work and Pensions (DWP) data Annual Population Survey (2017) Business Register and Employment Survey (BRES) Inter-Departmental Business Register (IDBR)
Valuation Office Agency (https://www.gov.uk/government/organisations/valuation-office-agency)	Business rates data
Land Registry (https://eservices.landregistry.gov.uk)	Community-facing businesses
HAL Property data and commissioned studies r.e. employment estimates	HAL Property Business Unit database Studies used in JEBIS Study (Joint Evidence Base and Infrastructure Study) inc. Optimal Economics (2011), Frontier Economics (2014)
Airports Commission Documents and DfT Analysis	Airports Commission Interim and Final Reports DfT Final Report
Local planning authorities	Published research and sector-specific data on skills, business, inward investment
Local Enterprise Partnerships	Published research and sector-specific data on skills, business, inward investment
Heathrow Airport Limited (www.heathrow.com)	Data held on employment, skills and training and business support Employee Survey (latest 2012/13) Feedback from ongoing activities including skills interventions and business support
Information generated by other environmental topics within the ES	Transport Historic Environment Land Quality

11. As outlined in Part 1, a future baseline will also be defined that incorporates economic and population forecasts, and confirmed planned land uses relevant to communities and the economy (e.g. restoration orders on land currently used for extraction, where there is an expectation of community benefit).

5.2. Socio-economic receptors and potential effects (Inner Study Area)

See Figures 2, 2a, 2b, 2c, 2d, and 2e

12. The inner study area (Figure 2) includes 'community' areas within 5 local authorities (LB Hillingdon, LB Hounslow, Spelthorne, Slough, South Bucks). Figures 2a-e and Appendix 1 set out the demographic and economic baseline and community facilities within communities in the inner study area areas, by Local Authority.

13. Table 4 sets out the receptors of community, economic and employment effects at the inner study area scale, and the type of effects they may experience.

Table 4: Socio-economic receptors and potential effects at the local scale (Inner Impact Area)

Receptor	Potential effects
Community	

• **Homes, Occupiers and Tenants**
  • Landlords
  • Owner-occupiers
  • Renters
  • Social renters
  • Supported accommodation
	• Loss and displacement due to CPZ
	• Sustainability and viability of remaining communities

• **Community Facilities**
  • Schools
  • Childcare (e.g. nurseries)
  • Sports & Leisure facilities including allotments, equipped play areas and indoor and outdoor sport (cross-over with RAIA)
  • Healthcare – GP surgeries, pharmacies, opticians, dentists
  • Libraries
  • Community centres, Village halls etc.
  • Community-facing businesses (e.g. pubs)
  • Places of worship
  • Special Needs provision
	• Loss / displacement due to land use change
	• Changes to access / severance
	• Effects on users, user groups / catchments
	• In-combination or other environmental effects on viability (drawing on other ES assessments)

• People (residents and visitors)	• In-combination or other environmental effects on people and their amenity
Economic & Employment	
• Business premises, commercial activities and land and their employees and customers / users • Local economy as influenced by resources and receptors as identified by other environmental topics including minerals (Land Quality) and heritage assets (Historic Environment).	• Potential temporary or permanent displacement of businesses or commercial activity including property, land and minerals • Potential effects on sustainability or viability of businesses resulting from the Project (such as temporary or permanent loss of catchment population, change in environment, or severance as a result of changes to access) • Potential effects on the local and wider economy as a result of significant residual significant environmental effects which have the potential for economic consequences
• People (employees and customers)	• Effects related to access to users of community-facing businesses • Changes in access (e.g. severance and journey time) from communities to employment locations

5.3. Socio-economic receptors and potential effects (Wider Study Areas)

See Figure 1a and Figure 1b

14. Table 5 sets out the receptors of community, economic and employment effects at the wider scales, and the type of effects they may experience.

Table 5: Socio-economic receptors and potential effects (at wider scales)

Receptor	Potential effects
Community	

• Public & Regulatory Services
  • Social care, adult and children's services
  • Housing
	• Demand for services
	• Effects on vulnerable populations
	• Effects on changing tenure and HMOs

• Planning	
• Homes and communities	• Effects related to uptake of WPO e.g. changes to tenure, demography, demand for community facilities and community cohesion
Economic & Employment	
• Local and regional economy / Supply chain / Business community	• Indirect, Induced employment including sectors such as freight/cargo, accommodation etc. • Procurement opportunities in construction and operational phases • Inward investment and raising competency • Connectivity benefits
• Public sector	• Retention of business rates
• Labour market and skills base	• Effects of the construction workforce • Employment creation (direct, indirect, induced) • Skills gains
• Business	• Supply chain effects • Inward investment and catalytic effects
• Housing market / Local Planning Authorities	• Potential demand for housing as a result of above-trend housing growth

6. Next steps

15. This Technical Note has been issued in advance of the programmes Community/Economic and Employment HSPG meeting on **1st May 2018**. Our intention is to discuss the content of this note and its appendices at that session, and gain any feedback on the potential effects, receptors and study areas in order to help us design our formal EIA scope through verbal and post-meeting written responses from HSPG.



APPENDICES

Appendix 1
Socio-economic baseline (Inner Study Area)

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1. INNER STUDY AREA

1.1.1 The inner study area consists of 19 community study areas. The community study areas are comprised of wards and output areas as set out in Table 9.2.1, using the lowest possible boundaries for which National Statistics (such as Census data) are available.

1.1.2 The inner study area has been drawn to encompass areas that may be directly affected and adjacent areas to which they have physical or functional connection. The individual community areas have been chosen based on an understanding of existing communities around Heathrow (in some cases using a best-fit to output area boundaries).

1.1.3 Where appropriate, the study area utilises physical break-lines such as the railway corridors. Elsewhere the boundary reflects existing networks of connectivity or potential opportunities for new linkages.

Table 9.2.1 Community (inner) study areas

Community Area	Local Authority	Output Areas & Wards within area
Stanwell Moor	Spelthorne	Output areas: E00156776, E00156777, E00156778, E00156779, E00156780, E00156781, E00156782, E00156783, E00156784, E00156785, E00156786, E00156787, E00156788, E00156789, E00156790, E00156791, E00156792, E00156794, E00156798, E00156799, E00156800, E00156801
Hounslow (West and Heath)	Hounslow	Hounslow West ward, Hounslow Heath ward, and the following output areas: E00012859, E00012861, E00012863, E00012865, E00012866, E00012867, E00012868, E00012869, E00012870, E00012871, E00012872, E00012873, E00012874, E00012875, E00012876, E00012877, E00012878
Hounslow (Central and South)	Hounslow	Hounslow Central ward, Hounslow South ward
Heston	Hounslow	Heston Central ward, Heston East ward and the following output areas: E00013085, E00013086, E00013087, E00013088, E00013090, E00013092, E00013093, E00013094, E00013095, E00013096, E00013097, E00013098, E00013099, E00013100, E00013101, E00013102, E00013103, E00013104, E00013105, E00013106, E00013107, E00013108, E00013109, E00013110, E00013111, E00013113, E00013114, E00013115
Iver and Richings Park	South Bucks	Output Areas: E00089950, E00089956, E00089958, E00089959, E00089960, E00089961
Feltham North	Hounslow	Feltham North ward
Sipson	Hillingdon	Output Areas: E00012175, E00012183, E00012191

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Community Area	Local Authority	Output Areas & Wards within area
Colnbrook	Slough	Output Areas: E00083215, E00083216, E00083221, E00083223, E00083224, E00083226
Harlington	Hillingdon	Output Areas: E00012176, E00012177, E00012178, E00012180, E00012182, E00012186, E00012187, E00012189, E00012190, E00012192, E00012194, E00012195, E00012197, E00012199
Cranford	Hounslow	Output Areas: E00012858, E00012860, E00012862, E00012864, E00012879, E00012880, E00012881, E00012882, E00012883, E00012884, E00012885, E00012886, E00012887, E00012888, E00013089, E00013091, E00013112
Stanwell	Spelthorne	Output Areas: E00156776, E00156777, E00156778, E00156779, E00156780, E00156781, E00156782, E00156783, E00156784, E00156785, E00156786, E00156787, E00156788, E00156789, E00156790, E00156791, E00156792, E00156794, E00156798, E00156799, E00156800, E00156801,
Bedfont	Hounslow	Bedfont ward
Hayes	Hillingdon	Pinkwell ward
Poyle	Slough	Output Areas: E00083225, E00083227, E00083228, E00083229, E00083230
Cranford Cross	Hillingdon	Output Areas: E00012193, E00012196, E00012200, E00012201
Harmondsworth	Hillingdon	Output Areas: E00012181, E00012184, E00012185, E00012188, E00012198
Brands Hill	Slough	Output Areas: E00083214, E00083217, E00083218, E00083219, E00083220, E00083222, E00083231
West Drayton	LB Hillingdon	West Drayton ward and the following output areas: E00012174, E00012203, E00012204, E00012205, E00012206, E00012207, E00012208
Longford	LB Hillingdon	Output Areas: E00012179, E00012202

1.1.4 Demographic, housing and economic baseline data for each community study area is set out in turn within each community study area section (Sections 1.1-1.19), and presented alongside the data averages for the inner study area, and London and the South East for comparison purposes. The metrics and source presented for the demographic, housing and economic baseline are set out respectively in Table 9.2.2, Table 9.2.3 and Table 9.2.4.

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Table 9.2.2 Demographic baseline data sources

Measure	Source	Year	Spatial Level
Total Population	Census	2011	Community Area, inner study area, and London and the South East
Population Growth (2001-2011)		2001 and 2011	
Age Profile		2011	
Gender			
Self-Identified Ethnicity			
Main Language			
Religion			
Self-Reported Health			
Disability and Long-Term Health Problems			

Table 9.2.3 Housing baseline data sources

Measure	Source	Year	Spatial Level
Total Number of Households	Census	2011	Community Area, inner study area, and London and the South East
Accommodation Type			
Accommodation Tenure			
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
Household Composition			

Table 9.2.4 Economic baseline data sources

Measure	Source	Year	Spatial Level
Total Number of Working Age Residents	Census	2011	Community Area, inner study area, and London and the South East
Economic Activity			
Highest Level of Qualification			
Occupation			
Car or Van Availability			

1.1.5 As community facilities are geographically specific, these are listed within each community section based on the area they fall within.

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1.2 Harmondsworth

Table 9.2.5 Harmondsworth demographic baseline data

Measure	Harmondsworth	Inner study area	London and the South East
Population			
Total Population	1,850	193,000	16,800,000
Population Growth (2001-2011)	50 (2%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	350 (19%)	41,000 (21%)	3,270,000 (19%)
16-74	1,400 (75%)	143,000 (74%)	12,400,000 (74%)
75+	100 (6%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	950 (51%)	98,200 (51%)	8,270,000 (49%)
Female	900 (49%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	1,110 (60%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	100 (5%)	6,800 (4%)	573,000 (3%)
Asian/Asian British	490 (27%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	90 (5%)	13,000 (7%)	1,220,000 (7%)
Other	60 (3%)	7,000 (4%)	332,000 (2%)
Main Language			
English	1,430 (80%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	980 (53%)	74,100 (38%)	9,120,000 (54%)
No Religion	310 (17%)	22,900 (12%)	4,080,000 (24%)
Sikh	200 (11%)	26,000 (13%)	181,000 (1%)
Muslim	150 (8%)	30,500 (16%)	1,210,000 (7%)
Self-Reported Health			
Good Health	1,550 (84%)	161,000 (83%)	14,100,000 (84%)
Fair Health	220 (12%)	23,200 (12%)	1,950,000 (12%)
Bad Health	80 (4%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	260 (14%)	27,600 (14%)	2,510,000 (15%)

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Table 9.2.6 Harmondsworth housing baseline data

Measure	Harmondsworth	Inner study area	London and the South East
Households			
Total Number of Households	650	67,300	6,820,000
Accommodation Type			
House	590 (84%)	46,300 (67%)	4,510,000 (64%)
Flats	110 (16%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	370 (57%)	35,300 (52%)	3,980,000 (58%)
Social Rented	110 (16%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	160 (25%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	5 (2%)	1,560 (2%)	81,400 (1%)
Living Rent Free	10 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	80 (12%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	20 (6%)	3,260 (9%)	126,000 (3%)
Privately Rented	40 (22%)	4,340 (26%)	197,000 (13%)
Social Rented	20 (15%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	160 (25%)	15,800 (23%)	2,050,000 (30%)
One Family	370 (56%)	39,500 (59%)	4,020,000 (59%)
Other	120 (19%)	12,000 (18%)	750,000 (11%)

Table 9.2.7 Harmondsworth economic baseline data

Measure	Harmondsworth	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	1,400	143,000	12,400,000
Economic Activity			
Economically Active	1,040 (75%)	103,000 (72%)	8,910,000 (72%)
Unemployed	60 (5%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			

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Measure	Harmondsworth	Inner study area	London and the South East
No Formal Qualifications	310 (21%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	650 (43%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	320 (21%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	230 (15%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	250 (25%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	310 (32%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	420 (43%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	520 (80%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	130 (20%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.8 Harmondsworth community facilities data

Map ref.	Name	Description of facility
PS1	Harmondsworth Primary School	Mixed 1FE primary school with approximately 189 students on roll
PW1	St Mary's Church, Harmondsworth	Medieval Church of England parish church with churchyard (OS3) and church hall (C6)
PW2	Harmondsworth Baptist Church	Small Baptist chapel on Harmondsworth High Street
N1	Wonderland Day Nursery	Nursery located In Harmondsworth Community Hall (C1)
N2	Heathrow Day Nursery	Nursery located on Harmondsworth High Street
C1	Harmondsworth Community Hall	Small community hall located next to Harmondsworth Primary School, for hire and used by Wonderland Day Nursery (N1)
C6	St Mary's Church Hall	Hall connected to St Mary's Church and used by church groups
C30	Harmondsworth Scout Hut	Scout hall used by 1st Harmondsworth Scout Group
OS1	Harmondsworth Recreation Ground	Local park with tennis courts, playground and grass areas used for football and informal recreation
OS2	Harmondsworth Village Green	Small village green triangle
OS4	Pinglestone Close Allotments	Public, council-owned allotments

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Map ref.	Name	Description of facility
OS8	Moor Lane Allotments	Public, council-owned allotments in Harmondsworth Moor
OS9	Colne Valley Regional Park – Harmondsworth Moor	Section of Colne Valley Regional Park comprising Harmondsworth Moor
LB1	Ansell Garden Centre	Local community-facing business on Holloway Lane, includes community café and garden centre
LB2	Harmondsworth Village Stores	Local newsagent and shop
LB3	Gable Stores/Post Office	Post office branch and newsagent
LB5	Shell	Service station on Holloway Lane
P1	The Crown	Pub on Harmondsworth High Street
P2	The Five Bells	Pub on Harmondsworth High Street

1.3 Sipson

Table 9.2.9 Sipson demographic baseline data

Measure	Sipson	Inner study area	London and the South East
Population			
Total Population	970	193,000	16,800,000
Population Growth (2001-2011)	90 (11%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	220 (23%)	41,000 (21%)	3,270,000 (19%)
16-74	700 (72%)	143,000 (74%)	12,400,000 (74%)
75+	50 (6%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	520 (54%)	98,200 (51%)	8,270,000 (49%)
Female	450 (46%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	600 (62%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	40 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	240 (25%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	60 (6%)	13,000 (7%)	1,220,000 (7%)
Other	30 (3%)	7,010 (4%)	332,000 (2%)
Main Language			

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Measure	Sipson	Inner study area	London and the South East
English	710 (78%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	490 (50%)	74,100 (38%)	9,120,000 (54%)
No Religion	170 (17%)	22,900 (12%)	4,080,000 (24%)
Muslim	150 (15%)	30,500 (16%)	1,210,000 (7%)
Sikh	50 (5%)	26,000 (13%)	181,000 (1%)
Self-Reported Health			
Good Health	820 (84%)	161,000 (83%)	14,100,000 (84%)
Fair Health	120 (13%)	23,200 (12%)	1,950,000 (12%)
Bad Health	40 (4%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	110 (11%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.10 Sipson housing baseline data

Measure	Sipson	Inner study area	London and the South East
Households			
Total Number of Households	360	67,300	6,820,000
Accommodation Type			
House	340 (88%)	46,300 (67%)	4,510,000 (64%)
Flats	40 (11%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	170 (47%)	35,300 (52%)	3,980,000 (58%)
Social Rented	40 (12%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	140 (39%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	2 (1%)	1,560 (2%)	81,400 (1%)
Living Rent Free	5 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	40 (12%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	7 (4%)	3,260 (9%)	126,000 (3%)
Privately Rented	30 (18%)	4,340 (26%)	197,000 (13%)
Social Rented	8 (19%)	2,490 (18%)	175,000 (14%)

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Measure	Sipson	Inner study area	London and the South East
Household Composition			
One Person	90 (26%)	15,800 (23%)	2,050,000 (30%)
One Family	220 (60%)	39,500 (59%)	4,020,000 (59%)
Other	50 (14%)	12,000 (18%)	750,000 (11%)

Table 9.2.11 Sipson economic baseline data

Measure	Sipson	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	700	143,000	12,400,000
Economic Activity			
Economically Active	550 (78%)	103,000 (72%)	8,910,000 (72%)
Unemployed	40 (8%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	140 (18%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	330 (45%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	190 (26%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	90 (11%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	140 (29%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	150 (31%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	200 (41%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	280 (78%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	80 (22%)	18,900 (28%)	2,020,000 (30%)

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Table 9.2.12 Sipson community facilities data

Map ref.	Name	Description of facility
PS2	Heathrow Primary School	Mixed 2FE primary school with 399 pupils currently on roll. Includes school pitch and tennis court.
N4	The Co-Operative Childcare Heathrow	Nursery in Sipson Village
PW6	Sipson Christian Fellowship	Small Baptist/evangelical Christian chapel, mostly used as housing
C2	Sipson Community Centre	Community centre run by Sipson Community Association, at Sipson Recreation Ground
OS5	Sipson Recreation Ground	Open space with tennis courts, playing fields, playground
OS7	Grow Heathrow	Site formerly squatted and used as community garden by protest group, now vacant
LB4	Sipson Post Office	Post office branch
P3	The King William IV	Pub on Sipson Road
P4	The Plough	Pub on Sipson Road

1.4 Longford

1.4.1 The Longford Community Area covers two output areas (E00012179, E00012202). Output Area E00012179 contains the Colnbrook/Harmondsworth Immigration Removal Centre; to avoid this facility skewing demographic, housing and economic for normal residents, only Census data from Output Area E00012202 has been reported for the Longford tables only. Data for the inner study area as a whole is not affected.

Table 9.2.13 Longford demographic baseline data

Measure	Longford	Inner study area	London and the South East
Population			
Total Population	250	193,000	16,800,000
Population Growth (2001-2011)	20 (6%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	30 (10%)	41,000 (21%)	3,270,000 (19%)
16-74	210 (86%)	143,000 (74%)	12,400,000 (74%)
75+	9 (4%)	9,440 (5%)	1,150,000 (7%)

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Measure	Longford	Inner study area	London and the South East
Gender			
Male	140 (57%)	98,200 (51%)	8,270,000 (49%)
Female	110 (43%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	180 (72%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	7 (3%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	40 (16%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	10 (5%)	13,000 (7%)	1,220,000 (7%)
Other	10 (4%)	7,010 (4%)	332,000 (2%)
Main Language			
English	190 (81%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	160 (63%)	74,100 (38%)	9,120,000 (54%)
No Religion	30 (13%)	22,900 (12%)	4,080,000 (24%)
Muslim	10 (6%)	30,500 (16%)	1,210,000 (7%)
Hindu	10 (5%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	220 (90%)	161,000 (83%)	14,100,000 (84%)
Fair Health	20 (9%)	23,200 (12%)	1,950,000 (12%)
Bad Health	3 (1%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	20 (8%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.14 Longford housing baseline data

Measure	Longford	Inner study area	London and the South East
Households			
Total Number of Households	130	67,300	6,820,000
Accommodation Type			
House	80 (53%)	46,300 (67%)	4,510,000 (64%)
Flats	70 (47%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			

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Measure	Longford	Inner study area	London and the South East
Owner-Occupied	60 (47%)	35,300 (52%)	3,980,000 (58%)
Social Rented	4 (3%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	60 (48%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	0 (0%)	1,560 (2%)	81,400 (1%)
Living Rent Free	3 (2%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	10 (9%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	2 (3%)	3,260 (9%)	126,000 (3%)
Privately Rented	10 (15%)	4,340 (26%)	197,000 (13%)
Social Rented	0 (0%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	60 (45%)	15,800 (23%)	2,050,000 (30%)
One Family	60 (42%)	39,500 (59%)	4,020,000 (59%)
Other	20 (12%)	12,000 (18%)	750,000 (11%)

Table 9.2.15 Longford economic baseline data

Measure	Longford	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	210	143,000	12,400,000
Economic Activity			
Economically Active	180 (82%)	103,000 (72%)	8,910,000 (72%)
Unemployed	9 (5%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	30 (15%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	80 (38%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	80 (35%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	30 (13%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	60 (36%)	31,000 (33%)	3,920,000 (47%)

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Measure	Longford	Inner study area	London and the South East
Admin / Skilled Trades / Services	40 (24%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	70 (39%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	100 (78%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	30 (22%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.16 Longford community facilities data

Map Ref.	Name	Description of Facility
N3	Littlebrook Nursery	Nursery on Bath Road, Longford
EC6	Heathrow Special Needs Centre	Special needs centre and urban farm, providing animal husbandry lessons for special needs children
OS6	Heathrow Biodiversity Site – Peggy Bedford	Publicly accessible biodiversity site
P5	The White Horse	Pub in Longford village
P6	The King's Arms	Pub in Longford village

1.5 Harlington

Table 9.2.17 Harlington demographic baseline data

Measure	Harlington	Inner study area	London and the South East
Population			
Total Population	4,670	193,000	16,800,000
Population Growth (2001-2011)	90 (11%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	870 (19%)	41,000 (21%)	3,270,000 (19%)
16-74	3,620 (78%)	143,000 (74%)	12,400,000 (74%)
75+	180 (4%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	2,430 (52%)	98,200 (51%)	8,270,000 (49%)

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Measure	Harlington	Inner study area	London and the South East
Female	2,240 (48%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	2,140 (46%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	220 (5%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	1,730 (37%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	380 (8%)	13,000 (7%)	1,220,000 (7%)
Other	190 (4%)	7,010 (4%)	332,000 (2%)
Main Language			
English	2,810 (64%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	2,080 (44%)	74,100 (38%)	9,120,000 (54%)
Muslim	700 (15%)	30,500 (16%)	1,210,000 (7%)
No Religion	520 (11%)	22,900 (12%)	4,080,000 (24%)
Hindu	470 (10%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	4,020 (86%)	161,000 (83%)	14,100,000 (84%)
Fair Health	460 (10%)	23,200 (12%)	1,950,000 (12%)
Bad Health	190 (4%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	540 (12%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.18 Harlington housing baseline data

Measure	Harlington	Inner study area	London and the South East
Households			
Total Number of Households	1,860	67,300	6,820,000
Accommodation Type			
House	920 (47%)	46,300 (67%)	4,510,000 (64%)
Flats	1,020 (52%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	870 (47%)	35,300 (52%)	3,980,000 (58%)
Social Rented	200 (11%)	13,800 (20%)	1,270,000 (19%)

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Measure	Harlington	Inner study area	London and the South East
Privately Rented	750 (40%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	10 (1%)	1,560 (2%)	81,400 (1%)
Living Rent Free	20 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	290 (16%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	80 (9%)	3,260 (9%)	126,000 (3%)
Privately Rented	180 (23%)	4,340 (26%)	197,000 (13%)
Social Rented	30 (15%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	560 (30%)	15,800 (23%)	2,050,000 (30%)
One Family	960 (52%)	39,500 (59%)	4,020,000 (59%)
Other	340 (18%)	12,000 (18%)	750,000 (11%)

Table 9.2.19 Harlington economic baseline data

Measure	Harlington	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	3,620	143,000	12,400,000
Economic Activity			
Economically Active	2,780 (77%)	103,000 (72%)	8,910,000 (72%)
Unemployed	180 (6%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	670 (18%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	1,420 (37%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	990 (26%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	720 (19%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	680 (27%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	770 (30%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	1,120 (43%)	33,500 (36%)	1,860,000 (23%)

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Measure	Harlington	Inner study area	London and the South East
Car or Van Availability			
1+ Car/Van Available	1,230 (66%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	630 (34%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.20 Harlington community facilities data

Map ref.	Name	Description of facility
PS4	William Byrd Primary School	Mixed 3FE junior school with 591 pupils on roll; includes some nursery provision
N5	Littlebrook Nursery, Sipson	Nursery on Sipson Road
SC2	Harlington Hospice	Hospice in Harlington providing range of care and end of life services including outreach service
GP1	Glendale Medical Centre	GP surgery, Harlington High Street
GP2	Heathrow Medical Centre	GP surgery, Harlington High Street
D2	The Village Dental Care	Dentist surgery, Harlington High Street
PW4	Harlington Baptist Church	Baptist church with church hall (C10), Harlington High Street
PW5	St Peter and St Paul Church	Medieval Church of England parish church with churchyard and church hall
PW7	Sant Nirankari Mandal - International Nirankari Bhaven	Building on Sipson Lane owned by branch of spiritual movement based in India
C12	St Peter and St Paul Church Hall	Church hall owned by St Peter and St Paul church
C13	Harlington Scouts Hall	Hall owned by Harlington Scouts
LB9	Harlington Locomotive Society Miniature Railway	Local community business
LB12	Harlington Post Office	Post office branch
LB20	Harlington Hospice Charity Shop	Community business supporting Harlington Hospice
S5	William Byrd Pool	Public swimming pool used by schools, clubs and general public
S6/OS13	Little Harlington Playing Fields	Grass football and cricket pitches/playing fields with changing rooms and café
S8/OS14	Imperial College Sports Grounds	Sports fields owned by Imperial College London including grass pitches, artificial pitches and sports centre with changing rooms

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Map ref.	Name	Description of facility
PH3	The Village Pharmacy	Pharmacy on Harlington High Street
P11	The Pheasant Inn	Pub in Harlington village
P12	The Three Magpies	Pub on Bath Road
P13	The Wheatsheaf	Pub in Harlington village
P14	The White Hart	Pub in Harlington village
OS10	Harlington open space	Open space with public right of way
OS11	Browngraves Green	Public green with playground
OS12	Harlington School Grounds	Playing fields owned by Harlington school (no longer in use)
OS15	Sipson Meadow	Open space with playground
OS16	William Byrd Grounds	School grounds with playing field
OS17	Victoria Lane Burial Ground	Public cemetery
OS18	St Peter and St Paul's Churchyard	Churchyard connected to St Peter and St Paul's Church
OS19	Brickfield Lane Playground	Playground
OS20	Imperial College Sports Ground	Sports pitches owned by Imperial College London

1.6 West Drayton

Table 9.2.21 West Drayton demographic baseline data

Measure	West Drayton	Inner study area	London and the South East
Population			
Total Population	16,700	193,000	16,800,000
Population Growth (2001-2011)	3,030 (22%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	3,970 (24%)	41,000 (21%)	3,270,000 (19%)
16-74	11,800 (70%)	143,000 (74%)	12,400,000 (74%)
75+	980 (6%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	8,180 (49%)	98,200 (51%)	8,270,000 (49%)
Female	8,560 (51%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			

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Measure	West Drayton	Inner study area	London and the South East
White	10,980 (66%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	450 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	3,170 (19%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	1,390 (8%)	13,000 (7%)	1,220,000 (7%)
Other	450 (3%)	7,010 (4%)	332,000 (2%)
Main Language			
English	13,100 (83%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	8,640 (52%)	74,100 (38%)	9,120,000 (54%)
No Religion	3,560 (21%)	22,900 (12%)	4,080,000 (24%)
Muslim	1,740 (10%)	30,500 (16%)	1,210,000 (7%)
Hindu	760 (5%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	13,850 (83%)	161,000 (83%)	14,100,000 (84%)
Fair Health	2,040 (12%)	23,200 (12%)	1,950,000 (12%)
Bad Health	850 (5%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	2,610 (16%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.22 West Drayton housing baseline data

Measure	West Drayton	Inner study area	London and the South East
Households			
Total Number of Households	6,190	67,300	6,820,000
Accommodation Type			
House	4,350 (67%)	46,300 (67%)	4,510,000 (64%)
Flats	2,030 (32%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	3,160 (51%)	35,300 (52%)	3,980,000 (58%)
Social Rented	1,700 (27%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	1,110 (18%)	15,900 (24%)	1,400,000 (20%)

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Measure	West Drayton	Inner study area	London and the South East
Shared Ownership	160 (3%)	1,560 (2%)	81,400 (1%)
Living Rent Free	60 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	710 (12%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	190 (6%)	3,260 (9%)	126,000 (3%)
Privately Rented	210 (13%)	4,340 (26%)	197,000 (13%)
Social Rented	320 (14%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	1,520 (25%)	15,800 (23%)	2,050,000 (30%)
One Family	3,890 (63%)	39,500 (59%)	4,020,000 (59%)
Other	780 (13%)	12,000 (18%)	750,000 (11%)

Table 9.2.23 West Drayton economic baseline data

Measure	West Drayton	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	11,800	143,000	12,400,000
Economic Activity			
Economically Active	8,400 (71%)	103,000 (72%)	8,910,000 (72%)
Unemployed	620 (7%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	3,150 (25%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	5,420 (42%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	2,970 (23%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	1,230 (10%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	2,570 (34%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	2,720 (36%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	2,370 (31%)	33,500 (36%)	1,860,000 (23%)

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Measure	West Drayton	Inner study area	London and the South East
Car or Van Availability			
1+ Car/Van Available	4,510 (73%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	1,680 (27%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.24 West Drayton community facilities data

Map ref.	Name	Description of facility
PS3	West Drayton Primary School	State-funded primary school
PS5	St Catherine Catholic Primary School	State-funded primary school
PS6	Cherry Lane Primary School	State-funded primary school
PS8	Laurel Lane Primary School	State-funded primary school
PS9	St Martin's Church of England Primary School	State-funded primary school
EC1	Cherry Lane Children's Centre	Children's centre, with play, outreach and general children's services
EC2	West Drayton Library	Library
EC7	Abacus Childrens Centre	Children's centre
EC8	West Drayton Youth Centre	Youth Centre
EC24	Southlands Arts Centre	Public arts centre with exhibition space and classes
N20	Happy Tree Nursery	Nursery
SC7	Drayton Village Care Centre	Residential care centre for the elderly
SC8	Franklin House Care Home	Residential care centre for the elderly
SC9	The Burroughs Care Home	Residential care centre for the elderly
C35	West Drayton Scout Hall	Small scout hall
C3	The Meadows Community Centre	Community centre with hall for hire
C4	Yiewsley & West Drayton Community Centre	Community centre with hall for hire
C5	Drayton Garden Village Hall	Village hall for hire
LB6	Laurel Lane Post Office	Post office

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Map ref.	Name	Description of facility
LB7	West Drayton Post Office	Post office
PW54	St Catherine RC Church	Catholic church
PW55	West Drayton Baptist Church	Baptist church
PW48	Bell Farm Church	Evangelical Protestant church
PW50	St Martins Church West Drayton	Church of England church
GP4	The Medical Centre	GP practice
D1	Mydentist	Dental surgery
PH4	Orchard Pharmacy	Pharmacy
PH5	Carewell Chemists	Pharmacy
PH6	Winchester Pharmacy	Pharmacy
PH7	Boots (West Drayton)	Pharmacy
S1	Spirit Health And Fitness	Indoor gym
S2	Heathpark Golf Club	Small golf course adjacent to A408
OS112	The Closes	Open, green space
OS119	West Drayton Primary School playing fields	School playing fields
OS9	Colne Valley Regional Park	Harmondsworth Moor (north of M4)
OS123	West Drayton Depot Allotments	Council-owned allotments
OS197	Stockley Recreation Ground	Open, green space
OS198	Bell Farm Green	Open, green space
OS199	Beech Close Green	Open, green space
SO200	Autumn Green	Open, green space
OS127	Townmead Recreation Ground	Open, green space
OS201	Evergreen Drive Playground	Children's playground
OS202	Spring Green	Open, green space
OS203	Parklodge Avenue courtyards	Council-owned allotments
OS129	Cherry Lane Primary School playing fields	School playing fields
OS204	Holly Gardens	Open, green space

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Map ref.	Name	Description of facility
OS130	Heath Park Golf Club	Golf course
OS205	Spring Promenade Playground	Children's playground
OS132	Longmead/St. Martin's Primary School playing fields	School playing fields
OS206	West Drayton Cemetery	Public cemetery
OS207	West Drayton Cemetery Allotments	Council-owned allotments
OS134	MUGA west of Milton Way	Paved mixed-use games area
OS208	Southland Arts Centre Gardens	Grounds and gardens at Southland Arts Centre
OS209	The Green	Open, green space
OS210	St Martin's Church	Churchyard
OS211	Fray's Island Nature Reserve	Lake, river and nature reserve, part of Colne Valley Regional Park

1.7 Hayes

Table 9.2.25 Hayes demographic baseline data

Measure	Hayes	Inner study area	London and the South East
Population			
Total Population	14,800	193,000	16,800,000
Population Growth (2001-2011)	2,420 (20%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	3,890 (26%)	41,000 (21%)	3,270,000 (19%)
16-74	10,300 (70%)	143,000 (74%)	12,400,000 (74%)
75+	550 (4%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	7,420 (50%)	98,200 (51%)	8,270,000 (49%)
Female	7,350 (50%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	4,700 (32%)	82,900 (43%)	12,700,000 (76%)

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Measure	Hayes	Inner study area	London and the South East
Mixed/Multiple	560 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	7,030 (48%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	1,810 (12%)	13,000 (7%)	1,220,000 (7%)
Other	680 (5%)	7,010 (4%)	332,000 (2%)
Main Language			
English	9,290 (67%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	4,560 (31%)	74,100 (38%)	9,120,000 (54%)
Sikh	3,170 (21%)	26,000 (13%)	181,000 (1%)
Muslim	3,030 (20%)	30,500 (16%)	1,210,000 (7%)
Hindu	1,600 (11%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	12,400 (84%)	161,000 (83%)	14,100,000 (84%)
Fair Health	1,710 (12%)	23,200 (12%)	1,950,000 (12%)
Bad Health	660 (4%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	1,940 (13%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.26 Hayes housing baseline data

Measure	Hayes	Inner study area	London and the South East
Households			
Total Number of Households	4,650	67,300	6,820,000
Accommodation Type			
House	3,830 (81%)	46,300 (67%)	4,510,000 (64%)
Flats	910 (19%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	2,680 (58%)	35,300 (52%)	3,980,000 (58%)
Social Rented	950 (20%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	920 (20%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	20 (1%)	1,560 (2%)	81,400 (1%)

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Measure	Hayes	Inner study area	London and the South East
Living Rent Free	40 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	820 (18%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	310 (11%)	3,260 (9%)	126,000 (3%)
Privately Rented	290 (30%)	4,340 (26%)	197,000 (13%)
Social Rented	230 (24%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	840 (18%)	15,800 (23%)	2,050,000 (30%)
One Family	2,940 (63%)	39,500 (59%)	4,020,000 (59%)
Other	870 (19%)	12,000 (18%)	750,000 (11%)

Table 9.2.27 Hayes economic baseline data

Measure	Hayes	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	10,300	143,000	12,400,000
Economic Activity			
Economically Active	7,210 (70%)	103,000 (72%)	8,910,000 (72%)
Unemployed	550 (8%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	2,390 (22%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	4,420 (41%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	2,480 (23%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	1,590 (15%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	1,780 (27%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	2,050 (31%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	2,700 (41%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			

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Measure	Hayes	Inner study area	London and the South East
1+ Car/Van Available	3,490 (75%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	1,150 (25%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.28 Hayes community facilities data

Map ref.	Name	Description of facility
SS1	Harlington School	State-funded secondary school
PS7	Cranford Park Academy	State-funded primary school
PS10	Pinkwell Primary School	State-funded primary school
EC3	Harlington Library	Library
EC4	Harlington Adult Learning Centre	Adult education centre
EC5	Pinkwell Children's Centre	Children's centre
C11	Harlington and Hayes Community Centre	Community centre with rooms for hire
C34	Wentworth Crescent Scout's Hall	Small hall used by local Scouts groups
PW52	Christ Church Hayes	Church of England church
PW53	Life Oasis Centre	Evangelical Protestant church and centre
GP3	Shakespeare Medical Centre	GP surgery
GP31	Hayes Medical Centre	GP surgery
GP32	North Hyde Road Surgery	GP surgery
S3	Goals Soccer Centre (Heathrow)	Indoor and outdoor private football centre with pitches to hire
S4	Harlington Sports Centre	Sports centre owned by Harlington School, open to the public when not in school use
OS122	Bourne Farm Allotment	Council-owned allotments
OS21	Cranford Park	Part of Cranford Park north of M4
OS189	Cherry Lane Cemetery	Public cemetery
OS190	Goals Football Ground	Football pitches owned by Goals Soccer Centre
OS191	Station Road Allotments	Council-owned allotments
OS192	Lundy Drive MUGA	Mixed-use games area

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Map ref.	Name	Description of facility
OS110	Bourne Farm Recreation Ground	Open, green space
OS193	Lundy Drive Playground	Children's playground
OS111	Pinkwell Park	Open, green space
OS194	Hoskins Close Playground	Children's playground
OS195	Croyde Avenue Playground	Children's playground
OS196	Snowdon Crescent Green	Open, green space
OS131	Playing Fields W Pinkwell Primary, E Harlington Community School	School playing fields
OS117	Sam Philp Recreation Ground - The Moats	Open, green space
OS133	Cranford Park Primary School Playing Field	School playing fields

1.8 Cranford Cross

Table 9.2.29 Cranford Cross demographic baseline data

Measure	Cranford Cross	Inner study area	London and the South East
Population			
Total Population	1,630	193,000	16,800,000
Population Growth (2001-2011)	300 (22%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	360 (22%)	41,000 (21%)	3,270,000 (19%)
16-74	1,210 (74%)	143,000 (74%)	12,400,000 (74%)
75+	60 (4%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	830 (51%)	98,200 (51%)	8,270,000 (49%)
Female	800 (49%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	490 (30%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	60 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	890 (54%)	83,700 (43%)	1,960,000 (12%)

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Measure	Cranford Cross	Inner study area	London and the South East
Black/Black British	90 (5%)	13,000 (7%)	1,220,000 (7%)
Other	100 (6%)	7,010 (4%)	332,000 (2%)
Main Language			
English	890 (59%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	540 (33%)	74,100 (38%)	9,120,000 (54%)
Muslim	320 (20%)	30,500 (16%)	1,210,000 (7%)
Sikh	310 (19%)	26,000 (13%)	181,000 (1%)
Hindu	230 (14%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	1,390 (85%)	161,000 (83%)	14,100,000 (84%)
Fair Health	180 (11%)	23,200 (12%)	1,950,000 (12%)
Bad Health	60 (3%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	160 (10%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.30 Cranford Cross housing baseline data

Measure	Cranford Cross	Inner study area	London and the South East
Households			
Total Number of Households	550	67,300	6,820,000
Accommodation Type			
House	420 (76%)	46,300 (67%)	4,510,000 (64%)
Flats	130 (24%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	310 (57%)	35,300 (52%)	3,980,000 (58%)
Social Rented	20 (3%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	210 (38%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	2 (0%)	1,560 (2%)	81,400 (1%)
Living Rent Free	6 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			

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Measure	Cranford Cross	Inner study area	London and the South East
All Tenures	110 (19%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	30 (10%)	3,260 (9%)	126,000 (3%)
Privately Rented	70 (32%)	4,340 (26%)	197,000 (13%)
Social Rented	5 (26%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	110 (20%)	15,800 (23%)	2,050,000 (30%)
One Family	330 (61%)	39,500 (59%)	4,020,000 (59%)
Other	110 (19%)	12,000 (18%)	750,000 (11%)

Table 9.2.31 Cranford Cross economic baseline data

Measure	Cranford Cross	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	1,210	143,000	12,400,000
Economic Activity			
Economically Active	930 (77%)	103,000 (72%)	8,910,000 (72%)
Unemployed	60 (7%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	160 (13%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	450 (35%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	380 (30%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	280 (22%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	240 (28%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	260 (31%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	350 (41%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	410 (76%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	130 (24%)	18,900 (28%)	2,020,000 (30%)

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Table 9.2.32 Cranford Cross community facilities data

Map Ref.	Name	Description of Facility
PW11	St. Dunstan's Church	Medieval parish church and churchyard in Cranford park
OS21	Cranford Park	Parkland and woodland
OS22	Crane Meadows	Parkland and woodland
OS23	Berkeley Meadows	Open space with playground
OS27	Crane Meadows	Open space in river valley with public right of way

1.9 Cranford

Table 9.2.33 Cranford demographic baseline data

Measure	Cranford	Inner study area	London and the South East
Population			
Total Population	6,760	193,000	16,800,000
Population Growth (2001-2011)	630 (10%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	1,370 (20%)	41,000 (21%)	3,270,000 (19%)
16-74	5,100 (75%)	143,000 (74%)	12,400,000 (74%)
75+	290 (4%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	3,490 (52%)	98,200 (51%)	8,270,000 (49%)
Female	3,270 (48%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	1,470 (22%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	190 (3%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	4,390 (65%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	410 (6%)	13,000 (7%)	1,220,000 (7%)
Other	310 (5%)	7,010 (4%)	332,000 (2%)
Main Language			
English	3,610 (56%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Sikh	1,990 (29%)	26,000 (13%)	181,000 (1%)

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Measure	Cranford	Inner study area	London and the South East
Christian	1,590 (24%)	74,100 (38%)	9,120,000 (54%)
Muslim	1,560 (23%)	30,500 (16%)	1,210,000 (7%)
Hindu	910 (13%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	5,530 (82%)	161,000 (83%)	14,100,000 (84%)
Fair Health	900 (13%)	23,200 (12%)	1,950,000 (12%)
Bad Health	340 (5%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	1,020 (15%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.34 Cranford housing baseline data

Measure	Cranford	Inner study area	London and the South East
Households			
Total Number of Households	2,080	67,300	6,820,000
Accommodation Type			
House	1,550 (73%)	46,300 (67%)	4,510,000 (64%)
Flats	560 (26%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	1,130 (54%)	35,300 (52%)	3,980,000 (58%)
Social Rented	350 (17%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	560 (27%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	10 (0%)	1,560 (2%)	81,400 (1%)
Living Rent Free	30 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	400 (19%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	140 (12%)	3,260 (9%)	126,000 (3%)
Privately Rented	190 (32%)	4,340 (26%)	197,000 (13%)
Social Rented	80 (22%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	380 (18%)	15,800 (23%)	2,050,000 (30%)

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Measure	Cranford	Inner study area	London and the South East
One Family	1,170 (56%)	39,500 (59%)	4,020,000 (59%)
Other	530 (25%)	12,000 (18%)	750,000 (11%)

Table 9.2.35 Cranford economic baseline data

Measure	Cranford	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	5,100	143,000	12,400,000
Economic Activity			
Economically Active	3,540 (69%)	103,000 (72%)	8,910,000 (72%)
Unemployed	260 (7%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	950 (18%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	1,900 (35%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	1,470 (27%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	1,080 (20%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	880 (27%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	870 (27%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	1,440 (45%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	1,520 (73%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	560 (27%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.36 Cranford community facilities data

Map ref.	Name	Description of facility
SS2	Cranford Community College	Mixed 7FE Secondary School with 1,017 pupils on roll
SN2	The Cedars Primary School	Special school with 62 pupils currently on roll

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Map ref.	Name	Description of facility
PS23	Cranford Primary School	Mixed 3FE primary school with 605 pupils on roll
PW12	Holy Angels Church	Church of England church, Cranford High Street
PW13	Church of Our Lady and St. Christopher	Catholic church, Cranford High street
PW14	Heathrow Jamia Masjid Mosque	Mosque and Islamic cultural centre, Bath Road
PW15	Masjid Us Sunnah	Small Salafi mosque and prayer room in Bath Road house
PW16	Cranford Baptist Church	Baptist/evangelical Christian church
EC10	Meadowbank Adult Learning Centre	Adult education centre providing vocational and recreational daytime classes for adults
EC11	Cranford Children's Centre	SureStart children's centre based at Cranford Primary School
EC12	Cranford Library	Public library including meeting rooms and study areas
GP6	Dr Sandhu, PS & Partner	GP practice
GP7	Cranford Medical Centre	GP practice
N6	The Old Rectory Nursery School	Nursery on Church Road/ High Street Cranford
D3	Claradent Dental Care	Dentist surgery
D4	Berkeley Dental Practice	Dentist surgery
C7	Cranford Memorial Hall	Community hall with kitchen
PH9	Dunn Chemist	Pharmacy, Bath Road, Cranford
S9/OS26	Imperial College Sports Grounds Heston	Sports facilities owned by Imperial College London, including grass pitches and playing fields, tennis courts, artificial pitches and sports centre with changing facilities
S10	Cranford Community College Sports Facilities	Sports hall and grounds owned by school, open to public outside of school hours
S20	David Lloyd Sports Centre	Sports centre with gym, swimming pool, tennis court
OS24	Avenue Park	Public open space including tennis/basketball courts and children's playground
OS25	Cranford Community College Grounds	School grounds with grass playing fields, tennis courts and artificial pitches
OS27	Crane Meadows	River valley open space with public right of way
OS28	Waye Avenue Green	Green with playground
OS29	Cranford School grounds	School playing field and courtyard
OS30/ OS31	Firs Drive Green	Roadside greens
OS32	Avenue Gardens	Roadside greens

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Map ref.	Name	Description of facility
OS120	Waye Avenue Allotments	Public allotments

1.10 Heston

Table 9.2.37 Heston demographic baseline data

Measure	Heston	Inner study area	London and the South East
Population			
Total Population	36,200	193,000	16,800,000
Population Growth (2001-2011)	3,930 (12%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	7,700 (21%)	41,000 (21%)	3,270,000 (19%)
16-74	26,800 (74%)	143,000 (74%)	12,400,000 (74%)
75+	1,670 (5%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	18,400 (51%)	98,200 (51%)	8,270,000 (49%)
Female	17,800 (49%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	8,260 (23%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	1,090 (3%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	22,300 (62%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	2,550 (7%)	13,000 (7%)	1,220,000 (7%)
Other	1,980 (5%)	7,010 (4%)	332,000 (2%)
Main Language			
English	20,800 (60%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Sikh	9,340 (26%)	26,000 (13%)	181,000 (1%)
Christian	8,810 (24%)	74,100 (38%)	9,120,000 (54%)
Muslim	7,780 (22%)	30,500 (16%)	1,210,000 (7%)
Hindu	5,640 (16%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	29,700 (82%)	161,000 (83%)	14,100,000 (84%)

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Measure	Heston	Inner study area	London and the South East
Fair Health	4,520 (12%)	23,200 (12%)	1,950,000 (12%)
Bad Health	1,940 (5%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	5,410 (15%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.38 Heston housing baseline data

Measure	Heston	Inner study area	London and the South East
Households			
Total Number of Households	11,600	67,300	6,820,000
Accommodation Type			
House	7,800 (67%)	46,300 (67%)	4,510,000 (64%)
Flats	3,900 (33%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	6,190 (54%)	35,300 (52%)	3,980,000 (58%)
Social Rented	2,510 (22%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	2,580 (22%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	120 (1%)	1,560 (2%)	81,400 (1%)
Living Rent Free	160 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	2,080 (18%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	700 (11%)	3,260 (9%)	126,000 (3%)
Privately Rented	780 (28%)	4,340 (26%)	197,000 (13%)
Social Rented	600 (24%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	2,330 (20%)	15,800 (23%)	2,050,000 (30%)
One Family	6,720 (58%)	39,500 (59%)	4,020,000 (59%)
Other	2,500 (22%)	12,000 (18%)	750,000 (11%)

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Table 9.2.39 Heston economic baseline data

Measure	Heston	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	26,800	143,000	12,400,000
Economic Activity			
Economically Active	18,300 (68%)	103,000 (72%)	8,910,000 (72%)
Unemployed	1,440 (8%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	5,170 (18%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	9,880 (35%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	8,610 (30%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	4,790 (17%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	5,610 (34%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	4,940 (30%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	5,940 (36%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	8,350 (72%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	3,200 (28%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.40 Heston community facilities data

Map ref.	Name	Description of facility
PS21	Berkeley Primary School	State-funded primary school
PS36	The Rosary Catholic Primary School	State-funded primary school
PS40	Norwood Green Junior School	State-funded primary school
PS26	Westbrook Primary School	State-funded primary school
PS39	Heston Primary School	State-funded primary school
SS8	Lampton Academy	State-funded secondary school
PS41	Edison Primary School	State-funded primary school

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Map ref.	Name	Description of facility
PS31	Norwood Green Infant and Nursery School	State-funded primary school
PS16	Springwell Junior School	State-funded primary school
PS17	Springwell Infant and Nursery School	State-funded primary school
PS18	Wellington Primary School	State-funded primary school
SS9	Heston Community School	State-funded secondary school
EC22	Hounslow Library	Public library
EC14	Heston Library	Public library
N19	Nursery on the Green	Nursery
N14	Little Cherubs Day Nursery	Nursery
N15	Kinderoos Nursery	Nursery
SC6	Vicarage Farm Care Home	Care centre for the elderly
C21	Heston Village Hall	Community hall
C22	Heston Royal British Legion Hall	Community hall owned by local Royal British Legion
C29	Heston Community Centre	Community centre
C31	Hounslow Conservative Club/Hounslow Sports and Social Club	Community and sports centre with venue for hire
C32	Sutton Lane Community Centre	Community centre
LB18	Brabazon Road Post Office	Post Office
LB22	Heston Post Office	Post Office
PW42	St Paul's Church	Church of England church
PW44	Lakshmi Narayan Temple	Hindu Temple
PW45	St Leonard's Church	Church of England church
PW46	Heston Methodist Church	Methodist church
PW30	Darussalam Mosque	Mosque and Islamic cultural centre
PW31	Heston United Reformed Church	Evangelical Protestant church
PW32	All Saints Church	Evangelical Protestant church
GP19	Skyways Medical Centre	GP surgery
GP20	Dr. K M Singh	GP surgery
GP21	Heston Health Centre	GP surgery

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Map ref.	Name	Description of facility
GP25	The Crosslands Surgery	GP surgery
D19	Heston Health Clinic Dentists	Dental surgery
D20	Smile 32 Dentist	Dental surgery
D11	CareDental Smile Studios	Dental surgery
D12	Toothsome Dentists	Dental surgery
D13	Ghauri Dental Surgery	Dental surgery
D14	Badenhorst & Associates Dental Surgery	Dental surgery
PH18	Jade Pharmacy	Pharmacy
PH19	Medico Pharmacy	Pharmacy
S20	David Lloyd Sports Centre	Sports centre with gym, swimming pool, tennis courts etc
S21	Airlinks Golf Club	Private golf course
S22	Hounslow Sports and Social Club	Sports and community centre
S23	Heston Community School Sports Hall	School sports hall
S24	The Hounslow Dome	Badminton facility owned by Hounslow Badminton Association
S30	Hounslow Indoor Bowls Club	Indoor bowls club facilities
S31	Heston Pools and Fitness	Indoor swimming pools and fitness centre
OS184	Westbrook Road Allotments	Public allotments
OS185	Clunberry Avenue Green	Open, green space
OS186	Barnes Farm Allotments	Public allotments
OS187	Norwood Green School Grounds	School grounds and sports facilities
OS188	King's Arbour Park	Open, green space
OS156	Hounslow Bowls Club	Sports club grounds and facilities
OS158	New Brentford Cemetery	Public cemetery
OS159	Sutton Lane Allotments	Public allotments
OS160	Lampton Park	Open, green space
OS161	Hounslow Sports and Social Club	Sports club grounds and facilities
OS177	Claypole Drive MUGA	Public mixed-use games area
OS106	Brabazon Road Green	Open, green space

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Map ref.	Name	Description of facility
OS178	Sutton Lane Community Centre MUGA	Public mixed-use games area
OS107	Berkeley School Grounds	School grounds and sports facilities
OS179	Sutton Playing Field	Pubic open space/sports pitch and playground
OS108	Convent Way Green	Open, green space
OS180	Springwell School Grounds	School grounds and sports facilities
OS109	Airlinks Golf Course	Private golf course, now closed
OS181	Heston Park/Heston Sports and Leisure	Public park and sports facilities
OS182	St Leonard's Churchyard	Churchyard and cemetery
OS183	Heston Primary School/Community Sports Hall Grounds	School grounds and sports facilities
OS219	Lampton School Grounds	School grounds and sports facilities

1.11 Hounslow (Central and South)

Table 9.2.41 Hounslow (Central and South) demographic baseline data

Measure	Hounslow (Central and South)	Inner study area	London and the South East
Population			
Total Population	26,600	193,000	16,800,000
Population Growth (2001-2011)	4,990 (23%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	5,010 (19%)	41,000 (21%)	3,270,000 (19%)
16-74	20,200 (76%)	143,000 (74%)	12,400,000 (74%)
75+	1,360 (5%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	13,700 (52%)	98,200 (51%)	8,270,000 (49%)
Female	12,900 (48%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	10,700 (40%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	950 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	12,800 (48%)	83,700 (43%)	1,960,000 (12%)

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Measure	Hounslow (Central and South)	Inner study area	London and the South East
Black/Black British	1,220 (5%)	13,000 (7%)	1,220,000 (7%)
Other	910 (3%)	7,010 (4%)	332,000 (2%)
Main Language			
English	16,200 (64%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	9,980 (38%)	74,100 (38%)	9,120,000 (54%)
Hindu	5,310 (20%)	24,600 (13%)	504,000 (3%)
Muslim	3,850 (14%)	30,500 (16%)	1,210,000 (7%)
No Religion	2,730 (10%)	22,900 (12%)	4,080,000 (24%)
Self-Reported Health			
Good Health	22,700 (85%)	161,000 (83%)	14,100,000 (84%)
Fair Health	2,890 (11%)	23,200 (12%)	1,950,000 (12%)
Bad Health	1,000 (4%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	3,290 (12%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.42 Hounslow (Central and South) housing baseline data

Measure	Hounslow (Central and South)	Inner study area	London and the South East
Households			
Total Number of Households	9,330	67,300	6,820,000
Accommodation Type			
House	6,080 (64%)	46,300 (67%)	4,510,000 (64%)
Flats	3,440 (36%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	4,980 (53%)	35,300 (52%)	3,980,000 (58%)
Social Rented	1,110 (12%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	2,840 (30%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	310 (3%)	1,560 (2%)	81,400 (1%)
Living Rent Free	90 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			

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Measure	Hounslow (Central and South)	Inner study area	London and the South East
All Tenures	1,490 (16%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	410 (8%)	3,260 (9%)	126,000 (3%)
Privately Rented	880 (30%)	4,340 (26%)	197,000 (13%)
Social Rented	200 (18%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	2,140 (23%)	15,800 (23%)	2,050,000 (30%)
One Family	5,320 (57%)	39,500 (59%)	4,020,000 (59%)
Other	1,870 (20%)	12,000 (18%)	750,000 (11%)

Table 9.2.43 Hounslow (Central and South) economic baseline data

Measure	Hounslow (Central and South)	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	20,200	143,000	12,400,000
Economic Activity			
Economically Active	15,000 (74%)	103,000 (72%)	8,910,000 (72%)
Unemployed	910 (6%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	3,030 (14%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	6,900 (32%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	8,320 (39%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	3,320 (15%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	5,680 (41%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	4,080 (30%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	4,050 (29%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	6,070 (65%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	3,260 (35%)	18,900 (28%)	2,020,000 (30%)

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Table 9.2.44 Hounslow (Central and South) community facilities data

Map ref.	Name	Description of facility
IS3	Oak Heights Independent School	Independent school
PS30	Hounslow Town Primary School	State-funded primary school
PS32	Spring Grove Primary School	State-funded primary school
PS38	Chatsworth Primary School	State-funded primary school
PS42	Alexandra Primary School	State-funded primary school
SN3	Oaklands School	State-funded special school
SS10	Kingsley Academy	State-funded secondary school
OS169	Hounslow Avenue Allotments	Public allotments
OS170	Gainsborough Gardens Allotments	Public allotments
OS171	Gainsborough Gardens Green	Public park
OS172	Whitton Dene Open Space	Green, open space
OS173	Chatsworth Primary School Grounds	School grounds and sports facilities
OS174	Kinglesey Avenue Park	Public park
OS175	Colwyn Crescent Green	Green, open space
OS176	The Highlands Open Space	Green, open space
OS162	WERFA Park	Public park, maintained by community organisation
OS163	Thornbury Playing Fields	Open space and sports facility
OS164	Farnell Road Green	Green, open space
OS165	Depot Road Allotments	Public allotments
OS166	Inwood Park	Public park
OS167	Stanley Road Allotments	Public allotments
OS168	Inwood Road Allotments	Public allotments
OS220	Kingsley Academy Grounds	School grounds and sports facilities
EC23	Hounslow Youth Centre	Council-owned youth centre
SC5	Voyage Care 177-179 Spring Grove Road	Care for young people with range of disabilities
S26	The Gym (London Hounslow)	Privately-run gym/fitness centre

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Map ref.	Name	Description of facility
S27	Gold's Gym	Privately-run gym/fitness centre
S29	Anytime Fitness	Privately-run gym/fitness centre
GP24	Hounslow Family Practice	GP practice
GP27	Spring Grove Medical Practice	GP practice
GP28	Cecil Road Surgery	GP practice
GP29	Firstcare Practice	GP practice
GP30	Redwood Practice, Maswell Park Health Centre	GP practice

1.12 Hounslow (West and Heath)

Table 9.2.45 Hounslow (West and Heath) demographic baseline data

Measure	Hounslow (West and Heath)	Inner study area	London and the South East
Population			
Total Population	33,800	193,000	16,800,000
Population Growth (2001-2011)	6,680 (25%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	7,100 (21%)	41,000 (21%)	3,270,000 (19%)
16-74	25,300 (75%)	143,000 (74%)	12,400,000 (74%)
75+	1,390 (4%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	17,300 (51%)	98,200 (51%)	8,270,000 (49%)
Female	16,500 (49%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	9,200 (27%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	1,150 (3%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	19,700 (58%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	2,470 (7%)	13,000 (7%)	1,220,000 (7%)
Other	1,300 (4%)	7,010 (4%)	332,000 (2%)
Main Language			
English	18,400 (57%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			

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Measure	Hounslow (West and Heath)	Inner study area	London and the South East
Christian	10,000 (30%)	74,100 (38%)	9,120,000 (54%)
Muslim	7,140 (21%)	30,500 (16%)	1,210,000 (7%)
Hindu	6,850 (20%)	24,600 (13%)	504,000 (3%)
Sikh	4,410 (13%)	26,000 (13%)	181,000 (1%)
Self-Reported Health			
Good Health	28,100 (83%)	161,000 (83%)	14,100,000 (84%)
Fair Health	3,950 (12%)	23,200 (12%)	1,950,000 (12%)
Bad Health	1,810 (5%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	4,930 (15%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.46 Hounslow (West and Heath) housing baseline data

Measure	Hounslow (West and Heath)	Inner study area	London and the South East
Households			
Total Number of Households	11,100	67,300	6,820,000
Accommodation Type			
House	6,810 (60%)	46,300 (67%)	4,510,000 (64%)
Flats	4,470 (40%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	4,720 (43%)	35,300 (52%)	3,980,000 (58%)
Social Rented	2,760 (25%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	3,200 (29%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	220 (2%)	1,560 (2%)	81,400 (1%)
Living Rent Free	160 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	2,310 (21%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	690 (14%)	3,260 (9%)	126,000 (3%)
Privately Rented	1,090 (32%)	4,340 (26%)	197,000 (13%)
Social Rented	520 (19%)	2,490 (18%)	175,000 (14%)
Household Composition			

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Measure	Hounslow (West and Heath)	Inner study area	London and the South East
One Person	2,420 (22%)	15,800 (23%)	2,050,000 (30%)
One Family	6,100 (55%)	39,500 (59%)	4,020,000 (59%)
Other	2,550 (23%)	12,000 (18%)	750,000 (11%)

Table 9.2.47 Hounslow (West and Heath) economic baseline data

Measure	Hounslow (West and Heath)	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	25,300	143,000	12,400,000
Economic Activity			
Economically Active	17,800 (70%)	103,000 (72%)	8,910,000 (72%)
Unemployed	1,290 (7%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	4,680 (17%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	8,670 (32%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	8,620 (32%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	4,780 (18%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	5,290 (33%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	4,550 (28%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	6,300 (39%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	7,000 (63%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	4,070 (37%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.48 Hounslow (West and Heath) community facilities data

Map ref.	Name	Description of facility
PS33	Grove Road Primary School	State-funded primary school

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Map ref.	Name	Description of facility
PS20	Beavers Community Primary School	State-funded primary school
PS22	St Michael and St Martin RC Primary School	State-funded primary school
PS37	Orchard Primary School	State-funded primary school
SS7	The Heathland School	State-funded secondary school
IS2	Lady Nafisa Independent Secondary School for Girls	Independent school
PS13	Hounslow Heath Junior School	State-funded primary school
PS14	Hounslow Heath Infant and Nursery School	State-funded primary school
SS5	St Mark's Catholic School	State-funded secondary school
IS4	Suffah Primary School	Independent school
EC21	Midsummer Park Children's Centre	Council-run children's Sure Start centre
EC17	The Hub Library and Children's Centre	Community Hub
N7	The Co-Operative Childcare Hounslow	Nursery
N16	Midsummer Park Pre-School	Public pre-school
N17	Bambinos Montesori Nursery	Nursery
N18	Parkside Playgroup	Nursery in church hall
C24	The Hub Community Centre	Community centre
C33	Islamic Integration Community Centre	Islamic cultural and community centre
PW35	Jalaram Jupadi Virpur Dham Hounslow	Hindu Temple
PW36	Hounslow Central Mosque	Main mosque for Hounslow area
PW37	Emmanuel Baptist Church	Baptist church
PW38	Gurdwara Sri Guru Singh Sabha	Sikh temple for Hounslow area
PW39	Kingdon Hall Jehovah Witnesses	Jehovah Witnesses church
PW56	St Stephen's Church	Church of England church

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Map ref.	Name	Description of facility
PW57	St John's Mar Thoma Church	Church building, part of the Mar Thoma Church (originally based in India)
PW40	Unified Body of Christ Church International	Evangelical Protestant chapel
PW41	Ss Michael and Martin Catholic Church	Catholic church
PW43	Hounslow Gospel Hall	Evangelical Protestant chapel
PW47	Islamic Integration Community Centre	Islamic cultural and community centre with prayer rooms
PW17	Church of the Good Shepherd	Church of England church
PW34	Hounslow Methodist Church	Methodist church
GP18	Clifford Road Surgery	GP surgery
GP22	Heart of Hounslow Medical Centre	GP surgery
GP23	Hounslow Centre for Health	GP surgery
GP16	The Great West Surgery	GP surgery
GP17	The MWH Practice	GP surgery
D18	T J L Want Dentists	Dental surgery
D10	Hounslow West Dentists	Dental surgery
D15	Orthosmile Hounslow	Dental surgery
D16	Ealing and Hounslow PCT Community Dental Service	Dental surgery
D17	Mydentist Staines Road	Dental surgery
PH13	Boots Hounslow West	Pharmacy
PH17	Hobb's Pharmacy	Pharmacy
S19	Heathrow Gymnastics Club	Indoor sports hall
S28	Xercise4less Gym	Commercial gym
OS147	Midsummer Park and Playground	Public open space and playground
OS113	Beaversfield Park	Public open, green space
OS148	Cobbs Road Open Space	Public open space
OS149	The Orchard Primary School Grounds	School grounds and sports facilities
OS150	Grove Road Primary School Ground	School grounds and sports facilities

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Map ref.	Name	Description of facility
OS151	St Mark's Catholic School Grounds	School grounds and sports facilities
OS152	Maitland Close Playground	Children's playground
OS118	Hounslow Heath	Public open space and rights of way on Hounslow Heath
OS153	Logans Close Playground	Children's playground
OS154	St Michaels and St Martins Catholic School Grounds	School grounds and sports facilities
OS155	Maitland Close Open Space	Public open, green space
OS121	Open Space East of Clements Court	Public open, green space
OS157	Clements Court Playground	Children's playground
OS99	Green Lane Recreation Ground	Public open, green space
OS100	Hounslow Heath Golf Club	Golf course
OS101	Calvary Close	Public open, green space
OS27	Crane Meadows	Open space and public rights of way along Crane River
OS102	Chester Road Open Space	Public open, green space
OS103	Beavers School Grounds	School grounds and sports facilities
OS104	Aston Green	Public open, green space
OS105	Grantley Road	Public open, green space and playground
OS143	Heathland School Grounds	School grounds and sports facilities
OS144	Frampton Road Playspace	Children's playground
OS145	Vimy Close Playspace	Children's playground
OS146	Blackburn Way Playspace	Children's playground
OS221	Hounslow Heath School Grounds	School grounds and sports facilities

1.13 Feltham North

Table 9.2.49 Feltham North demographic baseline data

Measure	Feltham North	Inner study area	London and the South East
Population			

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Measure	Feltham North	Inner study area	London and the South East
Total Population	11,600	193,000	16,800,000
Population Growth (2001-2011)	1,990 (21%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	2,310 (20%)	41,000 (21%)	3,270,000 (19%)
16-74	8,480 (73%)	143,000 (74%)	12,400,000 (74%)
75+	780 (7%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	5,750 (50%)	98,200 (51%)	8,270,000 (49%)
Female	5,820 (50%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	7,070 (61%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	460 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	3,080 (27%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	680 (6%)	13,000 (7%)	1,220,000 (7%)
Other	280 (2%)	7,010 (4%)	332,000 (2%)
Main Language			
English	8,310 (75%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	5,950 (51%)	74,100 (38%)	9,120,000 (54%)
No Religion	1,950 (17%)	22,900 (12%)	4,080,000 (24%)
Muslim	1,270 (11%)	30,500 (16%)	1,210,000 (7%)
Hindu	920 (8%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	9,290 (80%)	161,000 (83%)	14,100,000 (84%)
Fair Health	1,600 (14%)	23,200 (12%)	1,950,000 (12%)
Bad Health	670 (6%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	1,930 (17%)	27,600 (14%)	2,510,000 (15%)

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Table 9.2.50 Feltham North housing baseline data

Measure	Feltham North	Inner study area	London and the South East
Households			
Total Number of Households	4,220	67,300	6,820,000
Accommodation Type			
House	3,100 (72%)	46,300 (67%)	4,510,000 (64%)
Flats	1,200 (28%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	2,490 (59%)	35,300 (52%)	3,980,000 (58%)
Social Rented	940 (22%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	680 (16%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	50 (1%)	1,560 (2%)	81,400 (1%)
Living Rent Free	60 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	510 (12%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	210 (8%)	3,260 (9%)	126,000 (3%)
Privately Rented	160 (22%)	4,340 (26%)	197,000 (13%)
Social Rented	130 (14%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	1,060 (25%)	15,800 (23%)	2,050,000 (30%)
One Family	2,520 (60%)	39,500 (59%)	4,020,000 (59%)
Other	640 (15%)	12,000 (18%)	750,000 (11%)

Table 9.2.51 Feltham North economic baseline data

Measure	Feltham North	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	8,480	143,000	12,400,000
Economic Activity			
Economically Active	6,060 (71%)	103,000 (72%)	8,910,000 (72%)
Unemployed	360 (6%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			

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Measure	Feltham North	Inner study area	London and the South East
No Formal Qualifications	2,410 (26%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	3,690 (40%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	1,950 (21%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	1,200 (13%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	1,500 (27%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	1,920 (34%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	2,200 (39%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	3,100 (73%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	1,120 (27%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.52 Feltham North community facilities data

Map Ref.	Name	Description of Facility
SS4	Space Studio West London	Studio school and sixth form specialising in skills, STEM and technical education
SS6	Rivers Academy West London	Secondary school academy and Sixth Form
PS15	Sparrow Farm Infant and Nursery School	State-funded nursery and infant school
PS19	Sparrow Farm Junior School	State-funded junior school
SC4	Coniston Lodge	Care centre providing a range of residential care including full nursing care, dementia care and care for people with mental health conditions
PW27	Salvation Army Church	Evangelical Christian chapel and charity centre run by the Salvation Army
PW28	Calvary Free Grace Baptist Church	Baptist church, Bedfont Lane
PW29	Southville Methodist Church	Methodist church, Bedfont Lane
C27	Feltham Assembly Hall	Community hall with meeting room, kitchen and bar

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Map Ref.	Name	Description of Facility
C28	Sparrow Farm Residents Association Club	Community centre, Sparrow Farm
GP13	Pentelow Practice	GP surgery
GP14	Carlton Surgery	GP surgery
GP15	Gill Medical Practice	GP surgery
P26	The Beehive	Pub
P27	The Green Man	Pub
D8	Feltham Park Dentists	Dentist surgery
D9	Feltham Dental Care	Dentist surgery
PH16	Boots Harlington Road West	Pharmacy
LB17	Harlington Road West Post Office	Post office branch
OS76	Hounslow Urban Farm	Urban farm and business
OS78	Hatton Cemetery	Public cemetery
OS87	Rivers Academy Playing Field	School grass playing fields and basketball courts
OS90	Blenheim Park	Public park and playing fields
OS91	Feltham Park	Public park with grass pitches, tennis courts, basketball courts, bowling green, playground, pond and Feltham Assembly Hall buildings/facilities
OS92	Glebelands Playing Fields	Public park and playing fields, including riverside path and former Feltham Arena
OS93	Brainton Ave Open Space	Public park and green
OS94	Sparrow Farm open space	Open green spaces in housing estate
OS95	Viola Ave Allotments	Public allotments
OS96	Sparrow Farm school grounds	School grounds and playing fields
OS97	Hatton Green	Small open space in housing courtyard
OS98	Heron Road Allotments	Public allotments

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1.14 Bedfont

Table 9.2.53 Bedfont demographic baseline data

Measure	Bedfont	Inner study area	London and the South East
Population			
Total Population	12,700	193,000	16,800,000
Population Growth (2001-2011)	2,600 (26%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	2,820 (22%)	41,000 (21%)	3,270,000 (19%)
16-74	9,160 (72%)	143,000 (74%)	12,400,000 (74%)
75+	720 (6%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	6,270 (49%)	98,200 (51%)	8,270,000 (49%)
Female	6,430 (51%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	8,170 (64%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	480 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	2,930 (23%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	860 (7%)	13,000 (7%)	1,220,000 (7%)
Other	270 (2%)	7,010 (4%)	332,000 (2%)
Main Language			
English	9,500 (79%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	6,360 (50%)	74,100 (38%)	9,120,000 (54%)
No Religion	2,600 (20%)	22,900 (12%)	4,080,000 (24%)
Muslim	1,330 (10%)	30,500 (16%)	1,210,000 (7%)
Hindu	750 (6%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	10,400 (82%)	161,000 (83%)	14,100,000 (84%)
Fair Health	1,600 (13%)	23,200 (12%)	1,950,000 (12%)
Bad Health	650 (5%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	1,970 (15%)	27,600 (14%)	2,510,000 (15%)

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Table 9.2.54 Bedfont housing baseline data

Measure	Bedfont	Inner study area	London and the South East
Households			
Total Number of Households	4,860	67,300	6,820,000
Accommodation Type			
House	3,370 (67%)	46,300 (67%)	4,510,000 (64%)
Flats	1,680 (33%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	2,340 (48%)	35,300 (52%)	3,980,000 (58%)
Social Rented	1,310 (27%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	780 (16%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	360 (7%)	1,560 (2%)	81,400 (1%)
Living Rent Free	50 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	500 (10%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	190 (7%)	3,260 (9%)	126,000 (3%)
Privately Rented	150 (17%)	4,340 (26%)	197,000 (13%)
Social Rented	170 (13%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	1,330 (27%)	15,800 (23%)	2,050,000 (30%)
One Family	2,920 (60%)	39,500 (59%)	4,020,000 (59%)
Other	610 (13%)	12,000 (18%)	750,000 (11%)

Table 9.2.55 Bedfont economic baseline data

Measure	Bedfont	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	9,160	143,000	12,400,000
Economic Activity			
Economically Active	6,750 (74%)	103,000 (72%)	8,910,000 (72%)
Unemployed	450 (7%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			

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Measure	Bedfont	Inner study area	London and the South East
No Formal Qualifications	2,370 (24%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	4,320 (44%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	1,990 (20%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	1,200 (12%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	1,780 (29%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	2,160 (35%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	2,290 (37%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	3,620 (75%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	1,240 (25%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.56 Bedfont community facilities data

Map ref.	Name	Description of facility
PS12	Bedfont Primary School	State-funded primary school
PS29	Fairholme Primary School	State-funded primary school
SN1	Marjory Kinnon School	State-funded special school
C19	St Mary's Church Hall Bedfont	Church hall
C20	Stoney Wall Community Centre	Community centre, currently closed
C23	Bedfont and Hatton Royal British Legion	Community hall and British Legion club
C25	Southville Community Centre	Community centre with children's centre
C26	Bedfont Public Hall	Community hall with nursery
N11	Bumbles Preschool	Nursery and pre-school
N12	The Alphabet Pre-School	Nursery and pre-school based in Bedfont Public Hall
N13	Little Dreams Day Nursery	Nursery
EC15	Bedfont library	Public library

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Map ref.	Name	Description of facility
EC18	Southville Youth and Children's Centre	Children's, youth and Sure Start centre based in Southville Community Centre
LB16	Bedfont Post Office	Post office branch
PW25	St Mary's Church Bedfont	Church of England parish church and churchyard
PW26	Airport Church Revival Centre	Evangelical Christian chapel
PW33	Bethany Church	Evangelical Protestant church
GP10	Hatton Medical Practice	GP Surgery
GP11	Bedfont Clinic	GP Surgery
GP12	Grove Village Medical Centre	GP Surgery
PH14	Boots Bedfont	Pharmacy
PH15	Edwards and Taylor	Pharmacy
D6	Bedfont Green Dental Practice	Dentist surgery
D7	Ealing and Hounslow PCT Community Dental Service	Dentist surgery
S17/OS80	Bedfont Recreation Grounds	Public outdoor sports ground with football and cricket pitches, tennis courts, pavilion and changing rooms
S18	Bedfont & Feltham Football & Social Club	Outdoor, club-owned football club and buildings with pavilion and changing rooms
P23	The Bell on the Green	Pub
P24	The Duke of Wellington	Pub
P25	The Load of Hay	Pub
OS74	Bedfont Lakes Country Park	Lakeland and nature reserve open to public
OS75	Bedfont Cemetery	Public cemetery
OS77	Southville Green	Open green space in housing estates
OS79	Hatton Road Allotments	Public allotments
OS81	Heathrow Biodiversity Site – Cain's Lane	Publicly accessible Heathrow biodiversity site
OS82	Heathrow Biodiversity Site – Two Bridges	Publicly accessible Heathrow biodiversity site
OS83	Bedfont Lake open space	Open, publicly accessible fields
OS84	Bedfont Green	Open green space
OS85	Fairholme Green	Open green space in housing estate

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Map ref.	Name	Description of facility
OS86	Bedfont Close Green	Open green space
OS88	East Bedfont Lake open space	Open, publicly accessible meadow
OS89	Cage Park	Open green space with playground

1.15 Stanwell

Table 9.2.57 Stanwell demographic baseline data

Measure	Stanwell	Inner study area	London and the South East
Population			
Total Population	14,600	193,000	16,800,000
Population Growth (2001-2011)	1,040 (8%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	2,970 (20%)	41,000 (21%)	3,270,000 (19%)
16-74	10,600 (73%)	143,000 (74%)	12,400,000 (74%)
75+	950 (6%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	7,290 (50%)	98,200 (51%)	8,270,000 (49%)
Female	7,260 (50%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	11,400 (79%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	400 (3%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	2,090 (14%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	430 (3%)	13,000 (7%)	1,220,000 (7%)
Other	200 (1%)	7,010 (4%)	332,000 (2%)
Main Language			
English	12,400 (89%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	8,760 (60%)	74,100 (38%)	9,120,000 (54%)
No Religion	3,160 (22%)	22,900 (12%)	4,080,000 (24%)
Sikh	550 (4%)	26,000 (13%)	181,000 (1%)
Muslim	470 (3%)	30,500 (16%)	1,210,000 (7%)

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Measure	Stanwell	Inner study area	London and the South East
Self-Reported Health			
Good Health	11,900 (82%)	161,000 (83%)	14,100,000 (84%)
Fair Health	1,900 (13%)	23,200 (12%)	1,950,000 (12%)
Bad Health	720 (5%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	2,280 (16%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.58 Stanwell housing baseline data

Measure	Stanwell	Inner study area	London and the South East
Households			
Total Number of Households	5,840	67,300	6,820,000
Accommodation Type			
House	4,170 (69%)	46,300 (67%)	4,510,000 (64%)
Flats	1,860 (31%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	3,490 (60%)	35,300 (52%)	3,980,000 (58%)
Social Rented	1,350 (23%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	760 (13%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	180 (3%)	1,560 (2%)	81,400 (1%)
Living Rent Free	60 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	400 (7%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	170 (5%)	3,260 (9%)	126,000 (3%)
Privately Rented	110 (13%)	4,340 (26%)	197,000 (13%)
Social Rented	140 (10%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	1,680 (29%)	15,800 (23%)	2,050,000 (30%)
One Family	3,550 (61%)	39,500 (59%)	4,020,000 (59%)
Other	610 (10%)	12,000 (18%)	750,000 (11%)

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Table 9.2.59 Stanwell economic baseline data

Measure	Stanwell	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	10,600	143,000	12,400,000
Economic Activity			
Economically Active	8,020 (75%)	103,000 (72%)	8,910,000 (72%)
Unemployed	460 (6%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	2,860 (25%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	5,510 (48%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	2,320 (20%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	890 (8%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	2,500 (33%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	2,637 (35%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	2,370 (32%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	4,750 (81%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	1,090 (19%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.60 Stanwell community facilities data

Map ref.	Name	Description of facility
PS11	Stanwell Fields CofE Primary School	State-funded primary school
PS28	Town Farm Primary School and Nursery	State-funded primary school and nursery
SS3	Thomas Knyvett College	State-funded secondary school
IS1	St. James Senior Boys' School	Independent school for boys
RU1	Fordway Centre	Pupil Referral Unit

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Map ref.	Name	Description of facility
C14/GP9	Stanwell Health and Community Centre	Community hub with health centre, GP practice (St. David's Family Practice), library, and café
C15	Stanwell Rose Community Centre	Community centre
C18	Stanwell Village Hall	Community hall
N8	Mini Tots Daycare	Nursery
N10	First Start Day Nursery	Nursery
SC1	Church View Care Home	Nursing home for long- and short-term care and respite services for carers
SC3	Ashford House Care Centre	Residential care for the elderly and people with dementia
LB14	Stanwell Post Office	Post Office Branch
LB15	Clare Road Post Office	Post Office Branch
PW19	St Mary the Virgin	Church of England parish church and churchyard
PW20	St David's Catholic Church	Catholic church
PW21	Stanwell Congregational Church	Evangelical Protestant church
PW22	Stanwell Cemetery Chapel	Cemetery chapel
PW23	Ashford Burial Ground Chapel	Cemetery chapel
PW24/C17	Ashford Mosque	Mosque and Islamic cultural/community centre
GP8	Ashford Health Centre	GP practice
PH10	Herman Pharmacy	Pharmacy
PH11	Herman Pharmacy	Pharmacy
PH12	Tesco Pharmacy	Pharmacy
D5	Stanwell Dental Practice	Dentist surgery
S11	Ashford Sports Club	Sports grounds with cricket and football pitches, games courts and club house/pavilion
S12	Ashford Town (Middlesex) FC Grounds	Football club grounds with grass pitch, changing rooms and stands
S13	Long Lane Recreation Ground	Playing courts, skate park, changing rooms, grass pitches
S15	Stanwell Recreation Ground Facilities	Tennis courts, bowling green, cricket pitch, bowling club building
P18	The Wheatsheaf	Pub
P19	The Swan Inn	Pub

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Map ref.	Name	Description of facility
P20	The Five Bells	Pub
P21	The Rising Sun	Pub
P22	The Sir John Gibson	Pub
OS43	Ashford Cemetery	Public cemetery
OS44	Ashford Sports Club Grounds	Sports pitches and clubhouse facilities
OS45	Ashford Town (Middlesex) FC Grounds	Football pitch, stands and clubhouse
OS46	Long Lane Recreation Ground	Open, green space with playground, skate park and tennis/basketball courts
OS47	Stanwell Fields Primary School Grounds	School grounds and sports fields
OS48	Victory Close Green & Playground	Open space and children's playground
OS49	Stanwell Village Park	Open, green space and children's playground
OS50	Stanwell Recreation Ground	Open, green space, children's playground, tennis courts and bowling green
OS51	Heathrow Biodiversity Site - Oaks Road	Biodiversity site with public pathways
OS52	Selwood Gardens Green	Open, green space
OS53	Nuthatch Close Playground	Children's playground
OS54	Lauser Road Park (Town Lane)	Open, green space
OS55	Stanwell Cemetery	Public cemetery
OS56	Stanwell Cemetery Allotments	Council-owned allotments
OS57	Town Farm Primary School Grounds	School grounds and sports fields
OS58	Clyde Road Park	Open, green space
OS60	Stanwell Village Green	Open, green space
OS61	Comet Road Green	Open, green space
OS62	Mulberry Ave/Holywell Way Green	Open, green space
OS63	Cambria Gardens Green	Open, green space
OS64	Eddystone Walk Green	Open, green space
OS65	Hadrian Way Green	Open, green space
OS66	Elsinore Avenue Green	Open, green space

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Map ref.	Name	Description of facility
OS67	Caledonia Road Green	Open, green space
OS68	Diamedes Avenue Green	Open, green space
OS69	Jordans Close Green	Open, green space
OS70	Staines Reservoir	Open lake and SSSI, open to public including birdwatchers

1.16 Stanwell Moor

Table 9.2.61 Stanwell Moor demographic baseline data

Measure	Stanwell Moor	Inner study area	London and the South East
Population			
Total Population	1,370	193,000	16,800,000
Population Growth (2001-2011)	30 (2%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	250 (18%)	41,000 (21%)	3,270,000 (19%)
16-74	1,080 (79%)	143,000 (74%)	12,400,000 (74%)
75+	40 (3%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	700 (51%)	98,200 (51%)	8,270,000 (49%)
Female	680 (49%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	1,080 (78%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	50 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	190 (14%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	30 (2%)	13,000 (7%)	1,220,000 (7%)
Other	30 (2%)	7,010 (4%)	332,000 (2%)
Main Language			
English	1,200 (90%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	800 (58%)	74,100 (38%)	9,120,000 (54%)
No Religion	280 (21%)	22,900 (12%)	4,080,000 (24%)
Sikh	80 (6%)	26,000 (13%)	181,000 (1%)

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Measure	Stanwell Moor	Inner study area	London and the South East
Hindu	60 (5%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	1,170 (85%)	161,000 (83%)	14,100,000 (84%)
Fair Health	130 (10%)	23,200 (12%)	1,950,000 (12%)
Bad Health	70 (5%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	160 (12%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.62 Stanwell Moor housing baseline data

Measure	Stanwell Moor	Inner study area	London and the South East
Households			
Total Number of Households	550	67,300	6,820,000
Accommodation Type			
House	490 (84%)	46,300 (67%)	4,510,000 (64%)
Flats	90 (16%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	400 (73%)	35,300 (52%)	3,980,000 (58%)
Social Rented	40 (7%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	100 (19%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	6 (1%)	1,560 (2%)	81,400 (1%)
Living Rent Free	4 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	40 (8%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	20 (5%)	3,260 (9%)	126,000 (3%)
Privately Rented	10 (13%)	4,340 (26%)	197,000 (13%)
Social Rented	7 (19%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	130 (23%)	15,800 (23%)	2,050,000 (30%)
One Family	370 (68%)	39,500 (59%)	4,020,000 (59%)
Other	50 (9%)	12,000 (18%)	750,000 (11%)

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Table 9.2.63 Stanwell Moor economic baseline data

Measure	Stanwell Moor	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	1,080	143,000	12,400,000
Economic Activity			
Economically Active	840 (77%)	103,000 (72%)	8,910,000 (72%)
Unemployed	30 (4%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	230 (21%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	600 (53%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	200 (18%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	90 (8%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	230 (29%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	320 (40%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	250 (31%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	510 (93%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	40 (7%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.64 Stanwell Moor community facilities data

Map ref.	Name	Description of facility
LB13	Stanwell Moor Post Office	Post office branch
C16	Stanwell Moor Village Hall	Community hall
PW18	Faith in God Ministries	Evangelical Christian church based in Stanwell Moor Village Hall
S14/OS42	Stanwell Moor Recreation Ground	Open green space with grass pitches, playground and basketball court
P17	The Anchor	Pun
OS59	The Vineries Allotments	Public allotments
OS71	King George VI Reservoir	Open water

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Map ref.	Name	Description of facility
OS72	Hithermoor Road Green	Green space in housing estate
OS73	Hithermoor Lake	Publically accessible fish ponds and open space

1.17 Poyle

Table 9.2.65 Poyle demographic baseline data

Measure	Poyle	Inner study area	London and the South East
Population			
Total Population	1,730	193,000	16,800,000
Population Growth (2001-2011)	260 (17%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	290 (17%)	41,000 (21%)	3,270,000 (19%)
16-74	1,380 (80%)	143,000 (74%)	12,400,000 (74%)
75+	60 (3%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	910 (53%)	98,200 (51%)	8,270,000 (49%)
Female	820 (47%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	1,010 (58%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	60 (3%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	660 (32%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	80 (5%)	13,000 (7%)	1,220,000 (7%)
Other	40 (2%)	7,010 (4%)	332,000 (2%)
Main Language			
English	1,290 (78%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	790 (46%)	74,100 (38%)	9,120,000 (54%)
No Religion	290 (16%)	22,900 (12%)	4,080,000 (24%)
Sikh	250 (14%)	26,000 (13%)	181,000 (1%)
Muslim	170 (10%)	30,500 (16%)	1,210,000 (7%)
Self-Reported Health			

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Measure	Poyle	Inner study area	London and the South East
Good Health	1,500 (87%)	161,000 (83%)	14,100,000 (84%)
Fair Health	190 (11%)	23,200 (12%)	1,950,000 (12%)
Bad Health	40 (2%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	175 (10%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.66 Poyle housing baseline data

Measure	Poyle	Inner study area	London and the South East
Households			
Total Number of Households	720	67,300	6,820,000
Accommodation Type			
House	500 (68%)	46,300 (67%)	4,510,000 (64%)
Flats	240 (32%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	400 (55%)	35,300 (52%)	3,980,000 (58%)
Social Rented	20 (3%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	300 (41%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	5 (1%)	1,560 (2%)	81,400 (1%)
Living Rent Free	1 (0%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	80 (11%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	30 (7%)	3,260 (9%)	126,000 (3%)
Privately Rented	50 (16%)	4,340 (26%)	197,000 (13%)
Social Rented	3 (14%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	230 (32%)	15,800 (23%)	2,050,000 (30%)
One Family	420 (58%)	39,500 (59%)	4,020,000 (59%)
Other	70 (10%)	12,000 (18%)	750,000 (11%)

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Table 9.2.67 Poyle economic baseline data

Measure	Poyle	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	1,380	143,000	12,400,000
Economic Activity			
Economically Active	1,120 (81%)	103,000 (72%)	8,910,000 (72%)
Unemployed	70 (6%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	220 (15%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	670 (47%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	360 (25%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	190 (13%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	330 (32%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	350 (33%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	370 (35%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	630 (87%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	90 (13%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.68 Poyle community facilities data

Map ref.	Name	Description of facility
PS25	Pippins School	State-funded primary school
P10	The Punch Bowl	Pub
OS33	Pippins Park	Public park with playground, tennis court and basketball court
OS34	Albany Park	Public open space and garden
OS41	Colnbrook Golf Driving Range	Golf driving range, now closed
OS224	Orlitts Lake	Lake used for fishing, includes visitor centre
OS225	Old Slade Lake	Lake used for fishing

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Map ref.	Name	Description of facility
OS226	Colnbrook West Lake	Lake used for fishing
OS227	Richings Park Shooting Club	Shooting club grounds, accessed by Old Slade Lane, Richings Park

1.18 Colnbrook

Table 9.2.69 Colnbrook demographic baseline data

Measure	Colnbrook	Inner study area	London and the South East
Population			
Total Population	1,840	193,000	16,800,000
Population Growth (2001-2011)	90 (5%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	390 (21%)	41,000 (21%)	3,270,000 (19%)
16-74	1,390 (76%)	143,000 (74%)	12,400,000 (74%)
75+	60 (3%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	930 (51%)	98,200 (51%)	8,270,000 (49%)
Female	910 (49%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	1,350 (74%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	70 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	270 (15%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	110 (6%)	13,000 (7%)	1,220,000 (7%)
Other	30 (2%)	7,010 (4%)	332,000 (2%)
Main Language			
English	1,450 (84%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	1,010 (55%)	74,100 (38%)	9,120,000 (54%)
No Religion	390 (21%)	22,900 (12%)	4,080,000 (24%)
Muslim	150 (8%)	30,500 (16%)	1,210,000 (7%)
Sikh	100 (5%)	26,000 (13%)	181,000 (1%)

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Measure	Colnbrook	Inner study area	London and the South East
Self-Reported Health			
Good Health	1,530 (83%)	161,000 (83%)	14,100,000 (84%)
Fair Health	210 (11%)	23,200 (12%)	1,950,000 (12%)
Bad Health	100 (6%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	240 (13%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.70 Colnbrook housing baseline data

Measure	Colnbrook	Inner study area	London and the South East
Households			
Total Number of Households	850	67,300	6,820,000
Accommodation Type			
House	480 (55%)	46,300 (67%)	4,510,000 (64%)
Flats	390 (45%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	290 (34%)	35,300 (52%)	3,980,000 (58%)
Social Rented	220 (26%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	290 (34%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	40 (5%)	1,560 (2%)	81,400 (1%)
Living Rent Free	7 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	80 (9%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	9 (3%)	3,260 (9%)	126,000 (3%)
Privately Rented	50 (15%)	4,340 (26%)	197,000 (13%)
Social Rented	20 (11%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	340 (40%)	15,800 (23%)	2,050,000 (30%)
One Family	440 (52%)	39,500 (59%)	4,020,000 (59%)
Other	70 (8%)	12,000 (18%)	750,000 (11%)

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Table 9.2.71 Colnbrook economic baseline data

Measure	Colnbrook	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	1,390	143,000	12,400,000
Economic Activity			
Economically Active	1,070 (77%)	103,000 (72%)	8,910,000 (72%)
Unemployed	80 (7%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	290 (20%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	660 (46%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	320 (22%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	180 (12%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	360 (36%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	310 (32%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	320 (32%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	670 (80%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	170 (20%)	18,900 (28%)	2,020,000 (30%)

Table 9.2.72 Colnbrook community facilities data

Map ref.	Name	Description of facility
PS24	Colnbrook Church of England Primary School	State-funded primary school
EC9	Vicarage Way Children's Centre and Library	Children's centre and public library
C8	Colnbrook Village Hall	Village hall and community centre
LB11	Colnbrook Post Office	Post office branch
PW8	Colnbrook and Poyle United Reform Church	Methodist church
PW9	Colnbrook Baptist Chapel	Baptist church

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Map ref.	Name	Description of facility
PW10	St. Thomas's Church	Church of England parish church and churchyard
GP5	Dr. Adam NS and Partners	GP surgery
PH8	Colnbrook Pharmacy	PH8
P7	The Queen's Arms	Pub
P8	The Ostrich Inn	Pub
P9	Ye Olde George	Pub
OS35	Colnbrook Recreation Ground	Public park with playground and grass pitch
OS137	St Thomas's Quiet Garden	Small garden behind church

1.19 Brands Hill

Table 9.2.73 Brands Hill demographic baseline data

Measure	Brands Hill	Inner study area	London and the South East
Population			
Total Population	2,590	193,000	16,800,000
Population Growth (2001-2011)	400 (18%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	610 (23%)	41,000 (21%)	3,270,000 (19%)
16-74	1,930 (74%)	143,000 (74%)	12,400,000 (74%)
75+	60 (2%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	1,330 (51%)	98,200 (51%)	8,270,000 (49%)
Female	1,270 (49%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	1,270 (49%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	120 (4%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	910 (35%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	230 (9%)	13,000 (7%)	1,220,000 (7%)
Other	70 (3%)	7,010 (4%)	332,000 (2%)
Main Language			
English	1,850 (76%)	126,000 (68%)	13,900,000 (86%)

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Measure	Brands Hill	Inner study area	London and the South East
Religion (top 4)			
Christian	1,220 (47%)	74,100 (38%)	9,120,000 (54%)
Muslim	400 (15%)	30,500 (16%)	1,210,000 (7%)
Sikh	330 (13%)	26,000 (13%)	181,000 (1%)
No Religion	310 (12%)	22,900 (12%)	4,080,000 (24%)
Self-Reported Health			
Good Health	2,250 (87%)	161,000 (83%)	14,100,000 (84%)
Fair Health	270 (10%)	23,200 (12%)	1,950,000 (12%)
Bad Health	80 (3%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	260 (10%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.74 Brands Hill housing baseline data

Measure	Brands Hill	Inner study area	London and the South East
Households			
Total Number of Households	970	67,300	6,820,000
Accommodation Type			
House	660 (67%)	46,300 (67%)	4,510,000 (64%)
Flats	330 (33%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	520 (53%)	35,300 (52%)	3,980,000 (58%)
Social Rented	130 (13%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	310 (32%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	9 (1%)	1,560 (2%)	81,400 (1%)
Living Rent Free	6 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	90 (10%)	10,100 (15%)	498,000 (7%)
Owner-Occupied	30 (6%)	3,260 (9%)	126,000 (3%)
Privately Rented	40 (14%)	4,340 (26%)	197,000 (13%)
Social Rented	20 (16%)	2,490 (18%)	175,000 (14%)

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Measure	Brands Hill	Inner study area	London and the South East
Household Composition			
One Person	250 (26%)	15,800 (23%)	2,050,000 (30%)
One Family	580 (60%)	39,500 (59%)	4,020,000 (59%)
Other	140 (14%)	12,000 (18%)	750,000 (11%)

Table 9.2.75 Brands Hill economic baseline data

Measure	Brands Hill	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	1,930	143,000	12,400,000
Economic Activity			
Economically Active	1,500 (78%)	103,000 (72%)	8,910,000 (72%)
Unemployed	120 (8%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	320 (16%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	870 (44%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	520 (26%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	280 (14%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	420 (31%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	440 (33%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	490 (36%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	810 (84%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	160 (16%)	18,900 (28%)	2,020,000 (30%)

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Table 9.2.76 Brands Hill community facilities data

Map ref.	Name	Description of facility
C9	Westfield Estate Community Centre	Small council-owned community centre
LB10	Brands Hill Post Office	Post Office branch
LB21	Colnbrook Special Needs Farm	Small animal farm in grounds owned by business, open to public
OS36	Crown Meadow	Public open green space
OS37	Crown Meadow Green	Small green in housing estate
OS38	Severn Crescent tennis court	MUGA, playground, basketball court
OS39	Severn Crescent green	Small green in housing estate
OS40	Trent Road green	Small green in housing estate

1.20 Iver and Richings Park

Table 9.2.77 Iver and Richings Park demographic baseline data

Measure	Iver and Richings Park	Inner study area	London and the South East
Population			
Total Population	2,350	193,000	16,800,000
Population Growth (2001-2011)	340 (17%)	30,600 (19%)	1,640,000 (11%)
Age Profile			
0-15	420 (18%)	41,000 (21%)	3,270,000 (19%)
16-74	1,790 (76%)	143,000 (74%)	12,400,000 (74%)
75+	150 (6%)	9,440 (5%)	1,150,000 (7%)
Gender			
Male	1,190 (50%)	98,200 (51%)	8,270,000 (49%)
Female	1,170 (50%)	95,200 (49%)	8,540,000 (51%)
Self-Identified Ethnicity			
White	1,500 (64%)	82,900 (43%)	12,700,000 (76%)
Mixed/Multiple	50 (2%)	6,810 (4%)	573,000 (3%)
Asian/Asian British	730 (31%)	83,700 (43%)	1,960,000 (12%)
Black/Black British	30 (1%)	13,000 (7%)	1,220,000 (7%)

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Measure	Iver and Richings Park	Inner study area	London and the South East
Other	50 (2%)	7,010 (4%)	332,000 (2%)
Main Language			
English	2,060 (91%)	126,000 (68%)	13,900,000 (86%)
Religion (top 4)			
Christian	1,140 (48%)	74,100 (38%)	9,120,000 (54%)
Sikh	440 (19%)	26,000 (13%)	181,000 (1%)
No Religion	350 (15%)	22,900 (12%)	4,080,000 (24%)
Hindu	180 (8%)	24,600 (13%)	504,000 (3%)
Self-Reported Health			
Good Health	2,070 (88%)	161,000 (83%)	14,100,000 (84%)
Fair Health	230 (10%)	23,200 (12%)	1,950,000 (12%)
Bad Health	60 (3%)	9,400 (5%)	780,000 (5%)
Disability and Long-Term Health Problems			
Day-to-day activities limited	280 (12%)	27,600 (14%)	2,510,000 (15%)

Table 9.2.78 Iver and Richings Park housing baseline data

Measure	Iver and Richings Park	Inner study area	London and the South East
Households			
Total Number of Households	800	67,300	6,820,000
Accommodation Type			
House	740 (89%)	46,300 (67%)	4,510,000 (64%)
Flats	90 (11%)	22,700 (33%)	2,560,000 (36%)
Accommodation Tenure			
Owner-Occupied	680 (85%)	35,300 (52%)	3,980,000 (58%)
Social Rented	20 (2%)	13,800 (20%)	1,270,000 (19%)
Privately Rented	90 (11%)	15,900 (24%)	1,400,000 (20%)
Shared Ownership	5 (1%)	1,560 (2%)	81,400 (1%)
Living Rent Free	9 (1%)	790 (1%)	88,400 (1%)
Levels of Over-Crowding (bedrooms, occupancy rating of -1 or less)			
All Tenures	30 (3%)	10,100 (15%)	498,000 (7%)

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Measure	Iver and Richings Park	Inner study area	London and the South East
Owner-Occupied	20 (2%)	3,260 (9%)	126,000 (3%)
Privately Rented	7 (7%)	4,340 (26%)	197,000 (13%)
Social Rented	1 (6%)	2,490 (18%)	175,000 (14%)
Household Composition			
One Person	130 (16%)	15,800 (23%)	2,050,000 (30%)
One Family	570 (70%)	39,500 (59%)	4,020,000 (59%)
Other	110 (13%)	12,000 (18%)	750,000 (11%)

Table 9.2.79 Iver and Richings Park economic baseline data

Measure	Iver and Richings Park	Inner study area	London and the South East
Working Age Residents			
Total Number of Working Age Residents	1,790	143,000	12,400,000
Economic Activity			
Economically Active	1,340 (75%)	103,000 (72%)	8,910,000 (72%)
Unemployed	50 (4%)	7,060 (7%)	535,000 (6%)
Highest Level of Qualification			
No Formal Qualifications	260 (13%)	29,700 (20%)	2,490,000 (18%)
GCSEs and A Level equivalent	880 (45%)	57,500 (38%)	5,470,000 (40%)
Further and Higher Education	660 (34%)	42,800 (28%)	4,560,000 (34%)
Other Qualifications	140 (7%)	22,400 (15%)	1,020,000 (8%)
Occupation			
Management / Professional / Technical	660 (52%)	31,000 (33%)	3,920,000 (47%)
Admin / Skilled Trades / Services	410 (32%)	29,300 (31%)	2,470,000 (30%)
Sales / Process / Elementary	200 (16%)	33,500 (36%)	1,860,000 (23%)
Car or Van Availability			
1+ Car/Van Available	760 (95%)	48,400 (72%)	4,800,000 (70%)
No Car/Van Available	40 (5%)	18,900 (28%)	2,020,000 (30%)

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Table 9.2.80 Iver and Richings Park community facilities data

Map ref.	Name	Description of facility
PW49	St Leonard's Church Richings Park	Church of England parish church
PW51	St Andrew's United Reformed Church	Presbyterian church
LB23	Richings Park Post Office	Post office
S25	Richings Sports Park	Sports club and leisure centre with clubhouse
OS124	Thorney Park Golf Club	Golf course
OS212	Richings Sports Park	Sports fields and sports centre
OS128	Richlings Park Golf Course	Golf course
OS213	Thorney Country Park	Nature reserve and lake in Colne Valley Regional Park
OS214	Huntsmoor Park	Public open green space
OS215	Huntsmoor Park Farm	Stud farm
OS216	Farlows Lake	Nature reserve and lake in Colne Valley Regional Park
OS217	Thorney Weir/Mets Lake	Nature reserve and lake in Colne Valley Regional Park
OS222	St Leonard’s Mound	Wooded area by St Leonard’s Church
OS223	St Leonard’s Churchyard	Grounds of St Leonard’s Church

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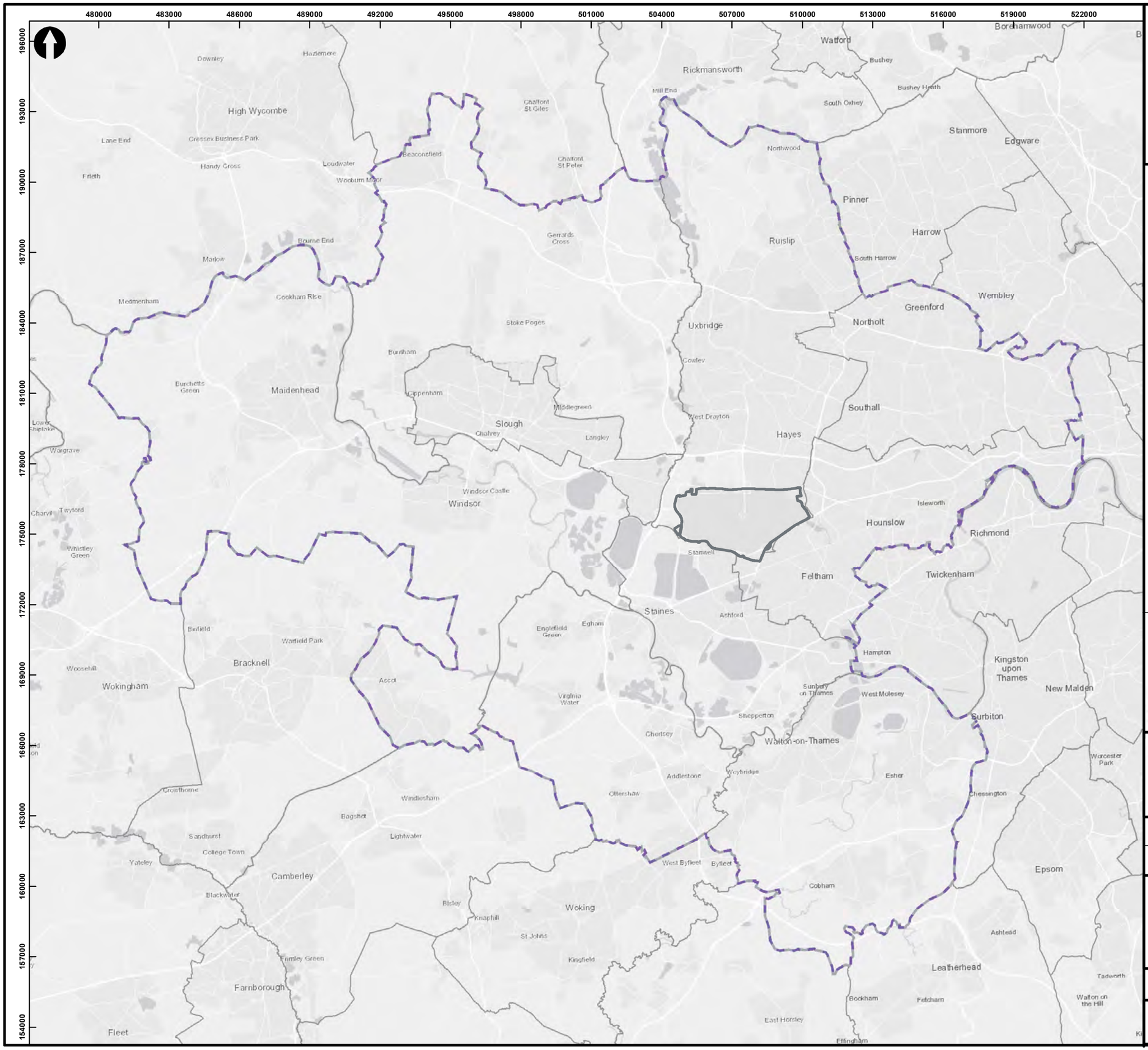


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Heathrow Expansion

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- Heathrow Planning Boundary
- Core study area
- Local authorities

0 800 1,600 3,200 4,800 6,400 8,000 9,600
Metres

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Heathrow

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Heathrow Expansion Project	

Title

Figure 10.1: Economics and employment core study area

Principal Designer	Drawn By	Chk/Approved	Drawn/Date	Status
Wood	BUTLS	NOYCA	18/04/2018	DRAFT

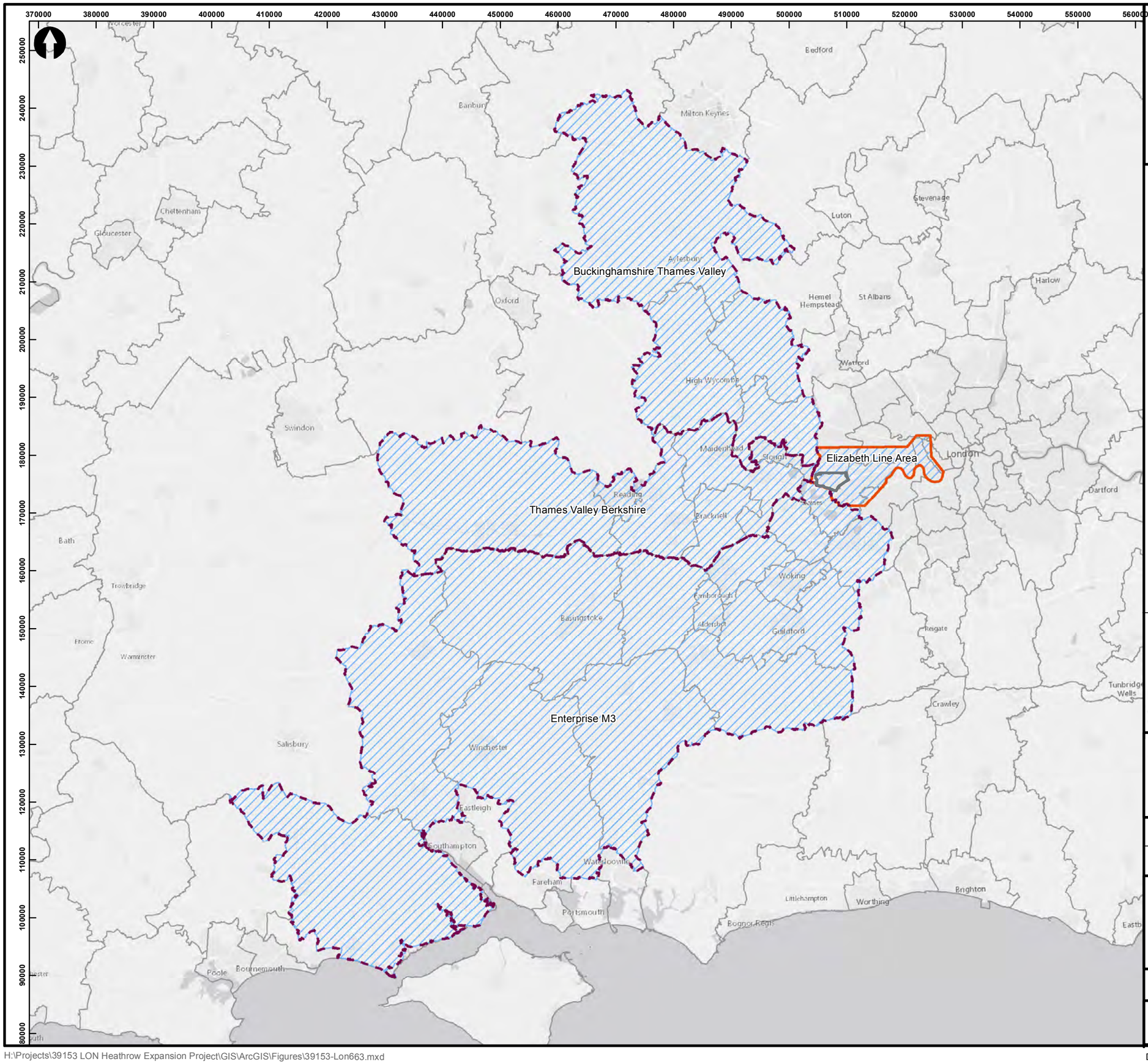
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- Heathrow Planning Boundary
- Sub-regional context area combined boundary
- Local authorities
- Local Enterprise Partnership
- Elizabeth Line Area (London Plan)

0 3,250 6,500 13,000 19,500 26,000 32,500 39,000 Metres

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Heathrow Expansion Project	

Title

Figure 10.2: Sub-Regional Context Area

Principal Designer	Drawn By	Chk/Approved	Drawn/Date	Status
Wood	BUTLS	NOYCA	18/04/2018	DRAFT

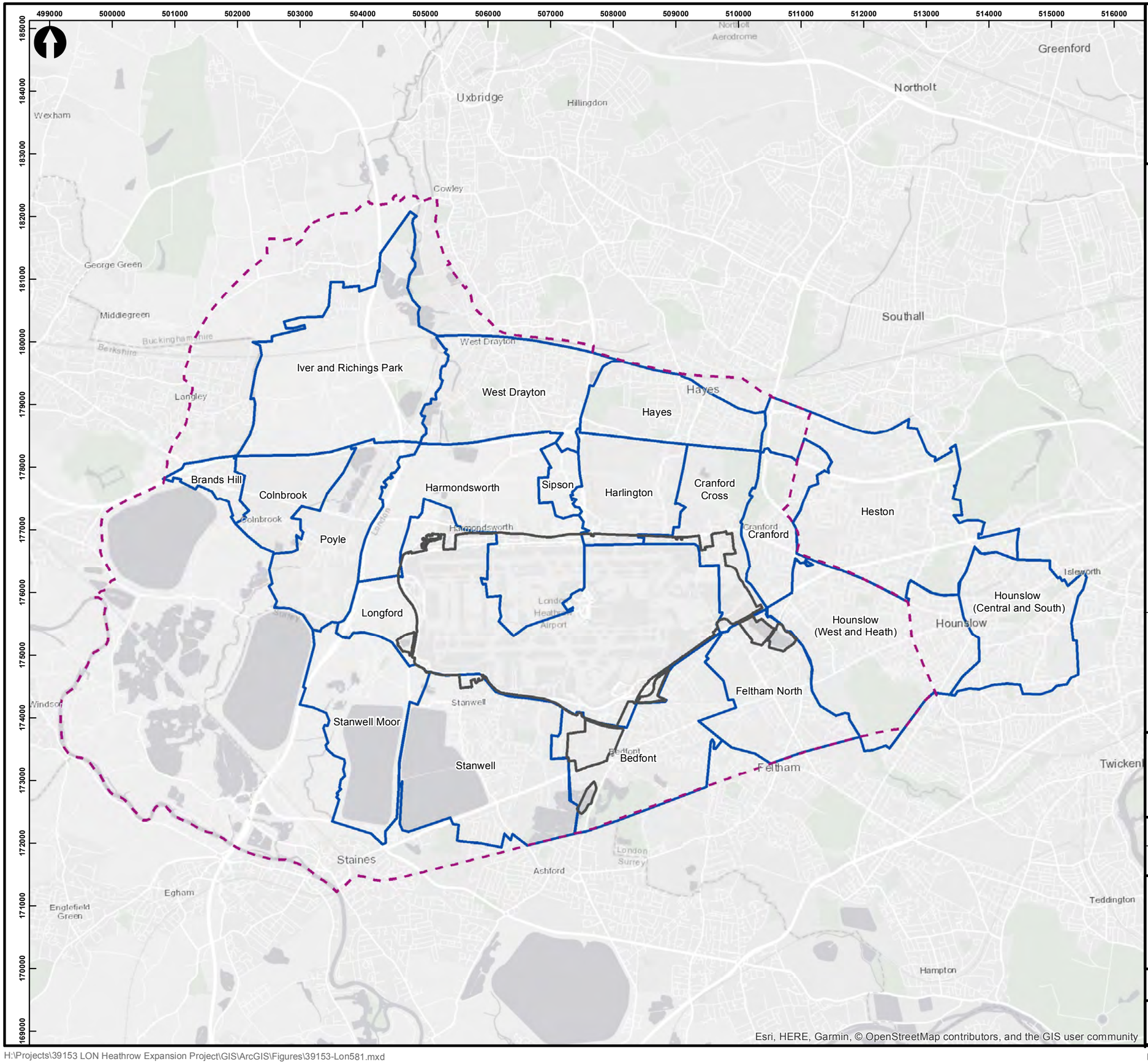
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- Existing Heathrow airport boundary
- Initial recreational spaces and routes study area
- Community areas

0 300 600 1,200 1,800 2,400 3,000 3,600 Metres

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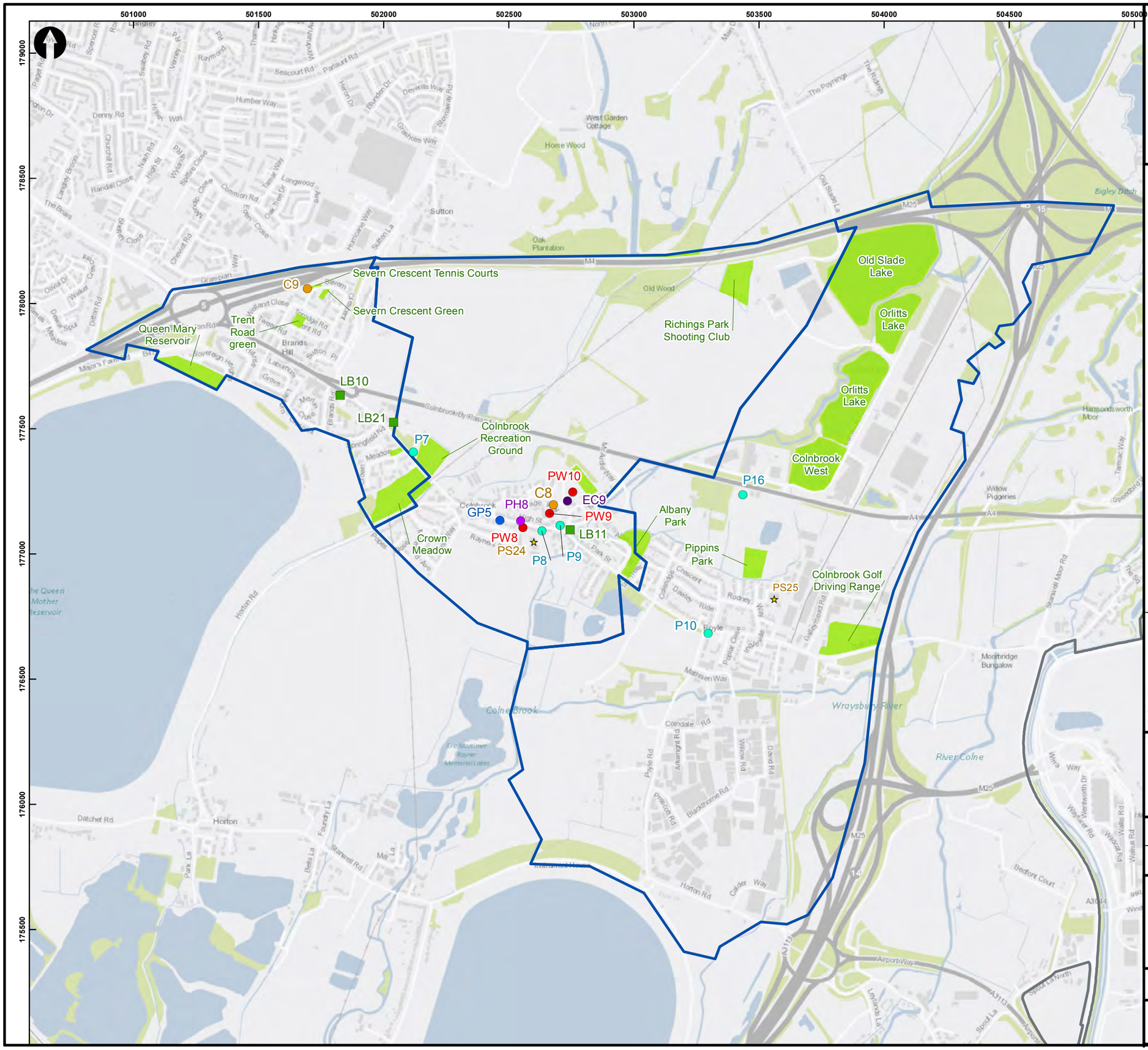
Title: Figure 9.1: Community study areas

Principal Designer	Drawn By	Chk/Approved	Drawn/Date	Status
Wood	BUTLS	NOYCA	21/03/2018	DRAFT

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- Heathrow Planning Boundary
- Combined community areas February 2018
- Open space
- Adult education or childrens centre
- Community hall
- Community service business
- GP surgery
- Pharmacy
- Place of worship
- Public house
- Schools

0 75 150 300 450 600 750 900 Metres

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Title

Figure 9.2.1: Community facilities - Slough

Principal Designer	Drawn By	Chk/Approved	Drawn/Date	Status
Wood	BUTLS	NOYCA	17/04/2018	DRAFT

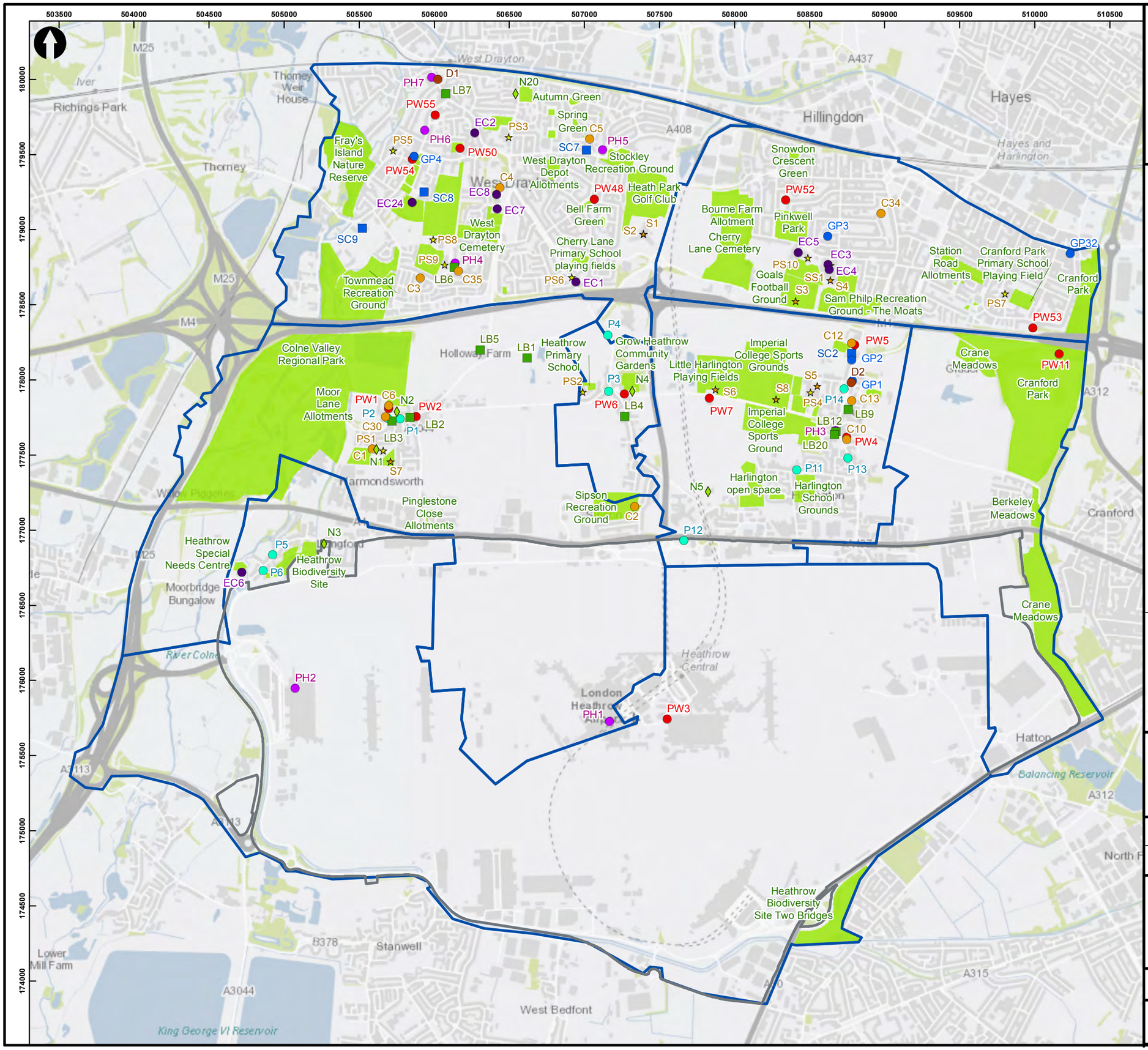
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- Heathrow Planning Boundary
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- Open space
- Adult education or childrens centre
- Childcare
- Community hall
- Community service business
- Dentist
- GP surgery
- Pharmacy
- Place of worship
- Public house
- Schools
- Social care
- Sports facility

0 125 250 500 750 1,000 1,250 1,500 Metres

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Figure 9.2.2: Community facilities - Hillingdon

Principal Designer	Drawn By	Chk/Approved	Drawn/Date	Status
Wood	BUTLS	NOYCA	17/04/2018	DRAFT

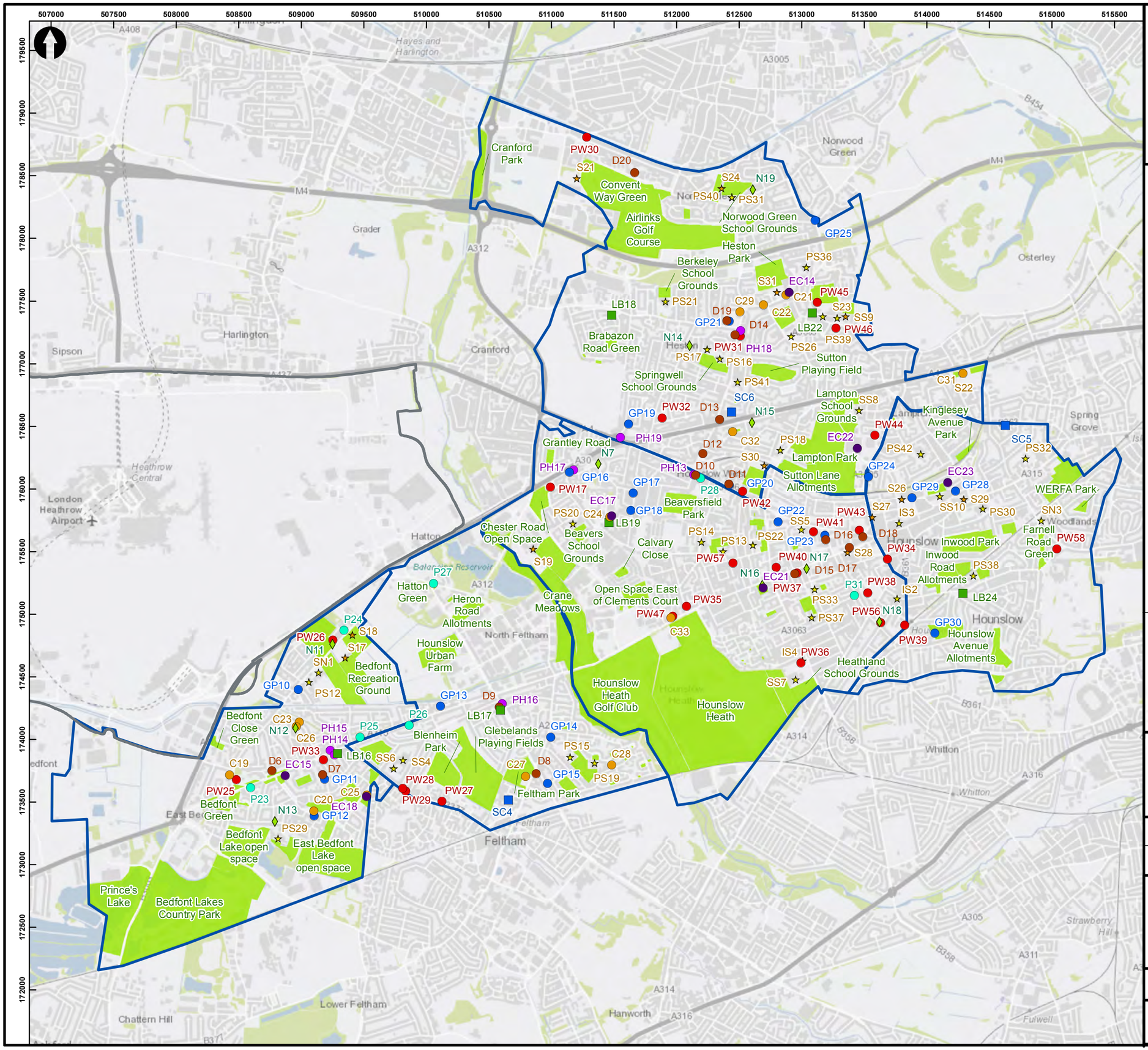
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- Heathrow Planning Boundary
- Combined community areas February 2018
- Open space
- Adult education or childrens centre
- Childcare
- Community hall
- Community service business
- Dentist
- GP surgery
- Pharmacy
- Place of worship
- Public house
- Schools
- Social care
- Sports facility

0 150 300 600 900 1,200 1,500 1,800 Metres

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Title

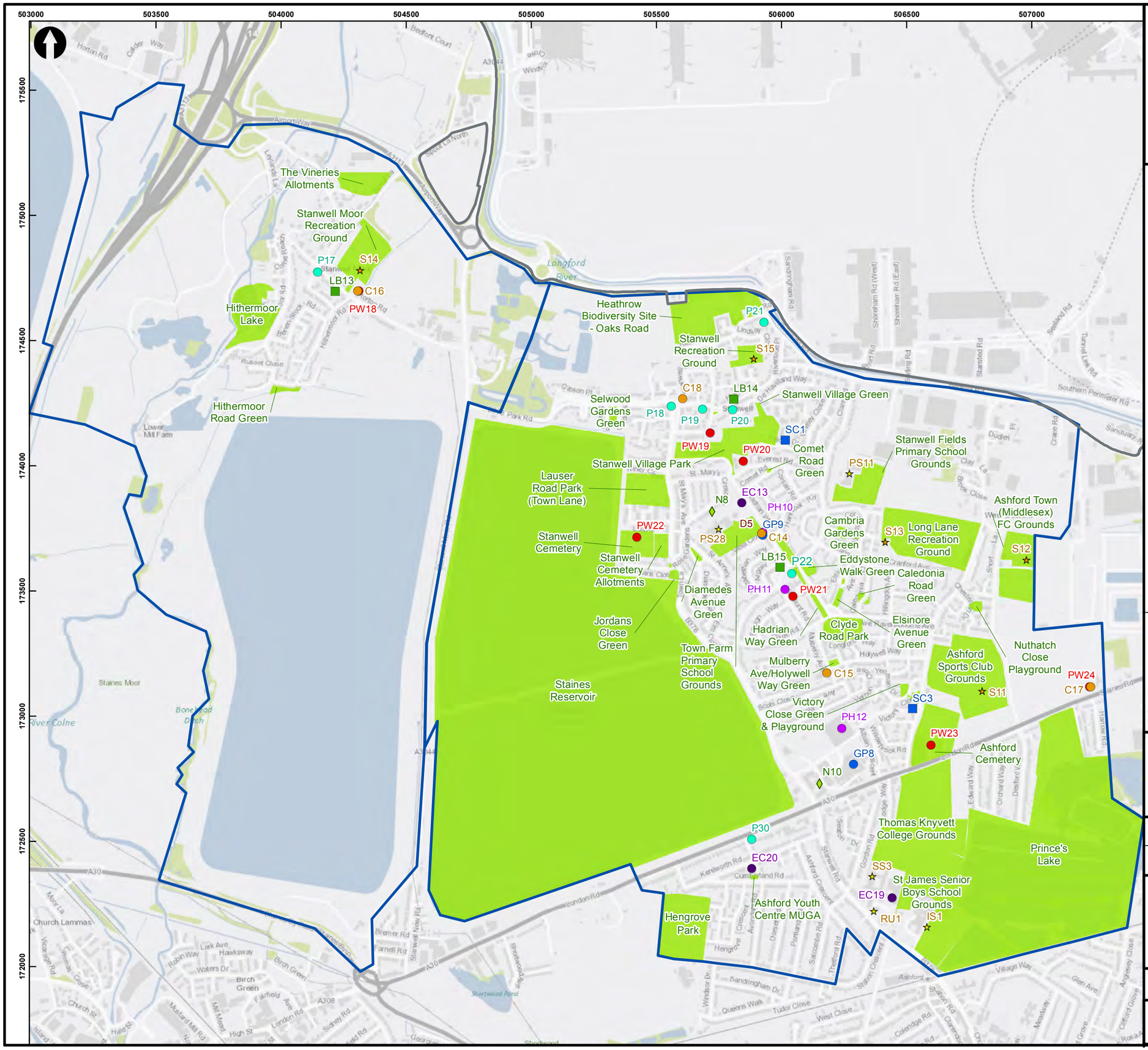
Figure 9.2.3: Community facilities - Hounslow

Principal Designer	Drawn By	Chk/Approved	Drawn/Date	Status
Wood	BUTLS	NOYCA	17/04/2018	DRAFT

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- Heathrow Planning Boundary
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- Open space
- Adult education or childrens centre
- Childcare
- Community hall
- Community service business
- Dentist
- GP surgery
- Pharmacy
- Place of worship
- Public house
- Schools
- Social care
- Sports facility

0 75 150 300 450 600 750 900 Metres

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Project Name	Heathrow Project No.
Heathrow Expansion Project	

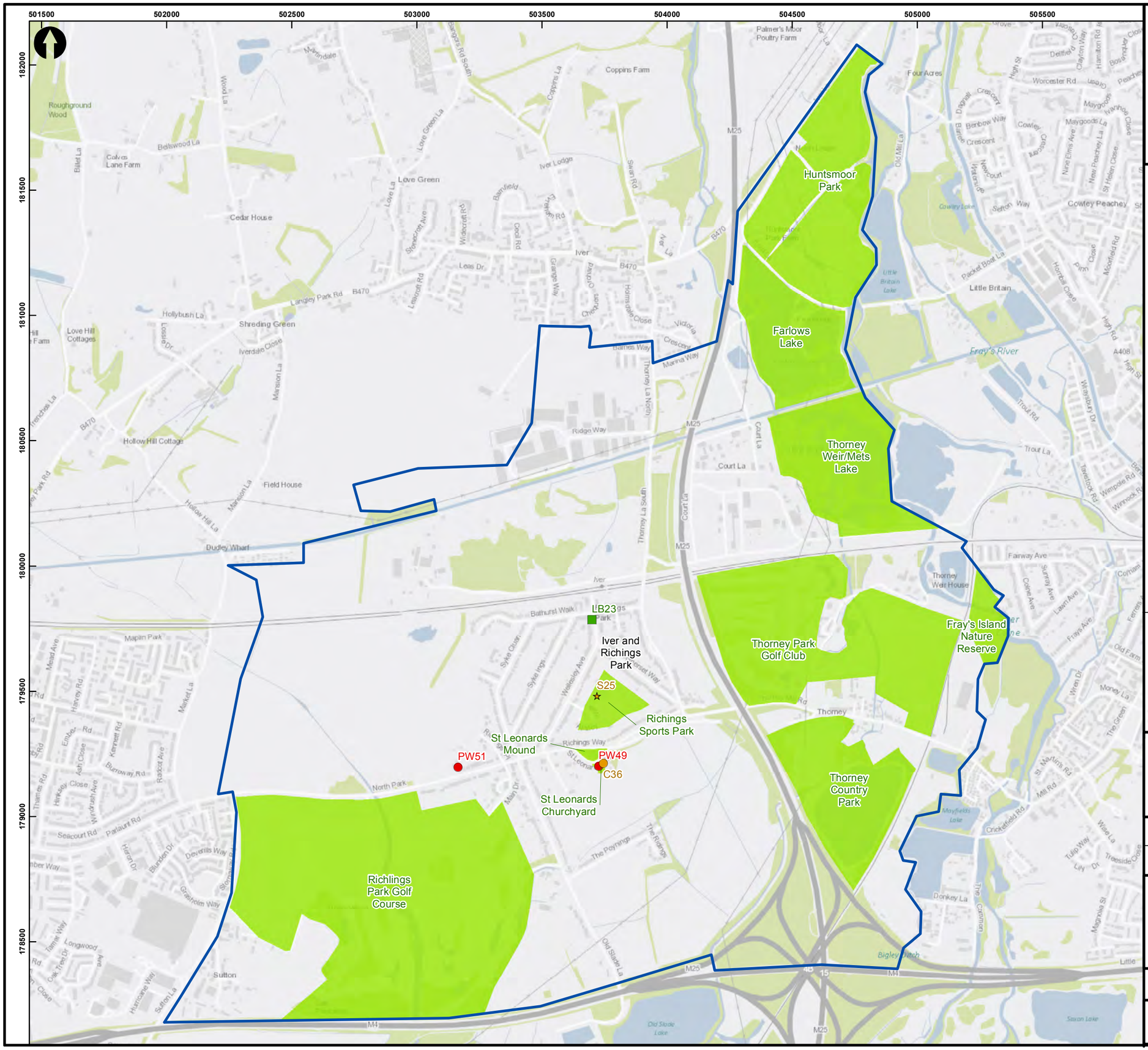
Title

Figure 9.2.4: Community facilities - Spelthorne

Principal Designer	Drawn By	Chk/Approved	Drawn/Date	Status
Wood	BUTLS	NOYCA	17/04/2018	DRAFT

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- Heathrow Planning Boundary
- Combined community areas February 2018
- Open space
- Community hall
- Community service business
- Place of worship
- Sports facility

0 75 150 300 450 600 750 900 Metres

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Project Name: Heathrow Expansion Project		Heathrow Project No.

Title: Figure 9.2.5: Community facilities - South Bucks

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Wood	BUTLS	NOYCA	17/04/2018	DRAFT

Project/Location-Level-Doc Type-System-Unique Identifier: 39153-Lon659.mxd

Version: 1.0

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Appendix 11.1
Historic environment
Characterising places

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This report has already been issued to some stakeholders for their consideration. As such, the report, the description of the development and some of the terminology used reflects the point in time that the report was produced and may differ from that presented in Volume 1 of this Scoping Report

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Historic environment

Characterising places

GRIMSHAW Quod ARUP ATKINS JACOBS MOTT MACDONALD wood. Heathrow

Document number: HEP53-XX-MS-XXX-016955

Documentum: Documentum Reference (if allocated)

Status: Draft

Classification: Public

Author: [redacted]

Role: Principal Consultant/Historic Environment Lead

Date: 12/02/2018

Version: 0.6

Document change history

Version	Date	Summary of changes
0.1	25/10/2017	[redacted]
0.2	09/11/2017	IDT EIAMT review
0.3	16/11/2017	Update following IDT EIAMT review
0.4	16/11/2017	Release for Heathrow review
0.5	02/02/2018	Amended for Historic England comments.
0.6	12/02/2018	Amended for HSPG comments

Stakeholders

Name	Role
[redacted]	SLA Lead, Historic England
[redacted]	Head of Historic Places Investigation, Historic England
[redacted]	Senior Investigator, Historic England
[redacted]	Aerial Investigation and Mapping Manager, Historic England
[redacted]	Principal Archaeological Adviser, GLAAS
[redacted]	Colne Valley Park CIC
[redacted]	Principal Conservation Officer, LB Hounslow
[redacted]	Strategic Infrastructure Projects Lead, Bucks CC
[redacted]	Principal Planning Officer Policy, South Bucks and Chiltern District Councils
[redacted]	Heritage Conservation Team Manager, Surrey County Council
[redacted]	Ealing Council

Checked by: Name: [redacted]
Role: TO5.3 Natural Environment Workstream Lead

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1. Introduction

1.1. Historic characterisation

1.1.1. The value of historic landscape character has been recognised in the Airport Commission appraisal framework.[1] Historic England guidance advocates a logical approach to making decisions affecting England's historic environment. It stresses the importance of understanding the fabric and evolution of places that are subject to change.2

1.1.2. In Understanding Place: Character and context in local planning Historic England describes historic characterisation as 'area-based ways of identifying and interpreting the historic dimension of present day townscape and landscape. It looks beyond individual heritage assets to the understanding of the overall character of a whole neighbourhood or area that is central to securing good quality, well designed and sustainable places'.[3]

1.1.3. This document describes the methodology for generating Historic Environment baseline data to assess the effects of Heathrow Expansion on the immediate environs, which includes areas that are both urban and semi-rural in character. It covers mapping, description and interpreting significance of the historic landscape, that will be used to inform proposals for Heathrow Expansion. It excludes the methodology for generating baseline data for the wider historic environment, particularly in terms of the wider noise and traffic impacts, which will be addressed separately. The document also excludes the assessment process, which will be developed through parallel EIA consultation (scoping, PEIR, ES).

1.1.4. This study will develop an understanding of how the present landscape is shaped by the past; and will explore distinctive historic places at a landscape scale and within a broad historic framework. Recognised local historic narratives and heritage themes will inform the characterisation process and are essential to the definition of character types.

1.1.5. A staged approach is proposed, first setting out the historical use and development of the wider landscape through historic landscape characterisation (HLC). This will lead into:

1. rapid historic area assessment (HAA) for areas of interest potentially affected by the expansion of Heathrow;
2. detailed HAA directed at areas where additional information is required, or a risk of significant impact is identified.

[1] Airports Commission, Airports Commission: Appraisal Framework, 2014
[2] Historic England, Conservation Principles, Policies and Guidance, 2008
[3] Historic England, Understanding Place: Character and context in local planning (Published by English Heritage 2011, revised 2012)

1.1.6. This nested characterisation strategy provides a flexible approach suited to the diverse nature of the historic environment evident at Heathrow.

1.2. Context

1.2.1. The expansion of Heathrow has the potential for far reaching construction and operational effects within an extensive and varied historic environment.

1.2.2. Paragraph 128 of the National Planning Policy Framework (NPPF) and recent guidance in the *Historic Environment Good Practice Advice in Planning: 2* (GPA2)[4] emphasises 'that the information required in support of applications … should be no more than is necessary to reach an informed decision, and that activities to conserve or investigate the asset needs to be proportionate to the significance of the heritage assets affected and the impact on that significance'.[5]

1.2.3. The Revised Draft Airport National Policy Statement (NPS): new runway capacity and infrastructure at airports in the South East of England[6] and NPPF describe the historic environment as 'all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora.'[7]

1.2.4. NPPF requires a description of the significance of heritage assets that might be affected by development during consideration of consent applications. It defines significance as 'the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting'.

1.2.5. A summary desk-based assessment was undertaken to inform the case for a third runway at Heathrow during the Davies Commission[8]. Various data resources were examined but generally this was limited to existing core baseline data sets held by the local planning authorities (LPA) or Historic England including:

1. Conservation area assessments: sensitive historic areas identified in local plans;
2. Local Authority Historic Environment Records (HER) data: spatially referenced data identifying designated and non-designated heritage assets, including listed buildings and scheduled monuments;
3. Historic Ordnance Survey mapping.

[4] Historic England, GPA2 Managing Significance in Decision-Taking in the Historic Environment, 2015
[5] DCLG, National Planning Policy Framework, 2012
[6] DfT, Draft Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England, 2017
[7] Ibid
[8] Heathrow Airport Limited, Understanding our heritage, Section 5.6 in, Taking Britain Further: Heathrow's plan for connecting the UK to growth, 2015

1.2.6. Historic characterisation will generate a consistent baseline, against which effects on heritage significance can be accurately understood and assessed; ensuring environmental information considered through the Development Consent Order (DCO) planning process is reliable and resilient.

1.3. Purpose

1.3.1. This methodology sets out an approach to establishing baseline data in line with the Revised Draft Airport NPS definition and NPPF guidance. Heathrow's approach to assessment is to provide a robust yet proportionate baseline, targeting detailed assessment where it is required[6]. Broad character types and sub-character types will be identified, described and mapped, to show the distribution and nature of structured historic characteristics that exist within the present landscape, and to reveal the significance of heritage assets likely to be affected by the proposed scheme. The more detailed characterisation will be undertaken for places where there is a richness and depth of historic assets.

1.3.2. It will also provide adequate evidence to demonstrate areas of low or negligible historic character value or interest, so that these can be appropriately scoped out in the Environmental Impact Assessment (EIA) component of the DCO application.

1.4. Location and description of project area

1.4.1. Heathrow is a major international airport located to the west of London in a landscape covering parts of the counties of Surrey, Berkshire, Buckinghamshire and the London Boroughs of Hillingdon and Hounslow. The airport's international status makes it the busiest airport in Europe for passenger traffic and it has evolved to become a major transport hub. It is situated just west of the M25 and south of the M4, accessed by Junctions 13, 14 and 15 on the M25 and Junction 4 of the M4. In addition, a network of A roads, including the A4 and A30, surround the airport. Rail transport includes the Heathrow Express and Heathrow Connect from London Paddington and the London Underground Piccadilly Line serving the four terminals (Terminals 2 and 3, Terminal 4 and Terminal 5).

1.4.2. Heathrow is located within the Metropolitan Green Belt, with the Colne Valley Regional Park to the west. The airport is on the fringe of the suburban conurbations to the east and surviving villages to the north, south and west. Villages, such as Cranford, Colnbrook, Harlington, Harmondsworth and Longford, trace their origins to the early medieval period and still retain historic cores despite proximity to major urban infrastructure.

1.5. Aims

1.5.1. To create an historic environment baseline that will support a robust assessment, in line with NPPF paragraphs 126,156, 157, 158, 169 and 170, of

the effects of the expansion of Heathrow on the historic environment. Expected impacts include:

1. The third runway and ancillary infrastructure; such as surface drainage, pollution control facilities, ecological mitigation sites, landscaping, fencing and fuel farms;
2. On-airport rationalisation, including aprons, taxiways, terminal buildings, etc;
3. Surface access alterations; M25 motorway and junctions, local roads and railhead;
4. River realignment;
5. Borrow pits and associated temporary transport infrastructure;
6. Urban & community integration (green infrastructure);
7. Commercial land-use, including airport parkway and gateways;

1.5.2. To provide baseline data that will be used to prepare EIA documentation required as part of a DCO application. The resulting baseline information will contribute to:

1. the design development of the Heathrow expansion scheme and associated green infrastructure;
2. assessment of the effects of the proposed development during the EIA process;
3. mitigation and design measures, including proposals for historic environment enhancement and interpretation.

1.5.3. Mitigation and design measures may also include interventions to improve the appreciation of heritage assets within the study area.

1.5.4. Where elements of the expansion scheme are located outside the study area, professional judgement will be used to assess whether the study area should be extended or a targeted assessment completed to supplement this baseline.

1.6. Objectives

1.6.1. The characterisation study will produce a comprehensive baseline map of historic character areas reflecting the distribution of defined character types. This will take into consideration key built heritage, historic landscapes and archaeological assets.

1.6.2. Character descriptions and assessment results will be provided in a series of assessment reports. These will clearly outline the key historic narratives, heritage assets and significance within the landscape.

1.6.3. The completed study will provide enhanced information and data as an important stakeholder legacy arising from the expansion of Heathrow. As part of the data collection and analysis process, we will consult with relevant stakeholders to determine how to supply the data in a suitable format for future use. To realise the legacy value, characterisation data will be collected,

organised and curated so that on completion enhanced data sets can be easily shared with contributory stakeholders, including:

1. Heathrow;
2. Historic England;
    a. Historic England Archive;
    b. Greater London Historic Environment Record (GLHER);
    c. Potential List Entry Review
3. Berkshire Historic Environment Record (BeHER);
4. Buckinghamshire Historic Environment Record (BuHER); and
5. Surrey Historic Environment Record (SHER).
6. Colne Valley Regional Park CIC

1.6.4. Mechanisms will be explored to publicise the results of research undertaken for the HLC/HAA and wider programme of archaeological works. To optimise the legacy benefits, the characterisation methodology described in this document has been designed to align with wider heritage management programme processes operated by stakeholders. In particular:

1. Aerial photography methodology broadly follows that of the Historic England Aerial Investigation and Mapping (AIM) standards as agreed with Historic England's advice (see Appendix C)
2. Potential List Entry reviews will follow the format and data requirements as to be advised on and agreed with the Historic England listing team.

1.7. Scope

Study Area

1.7.1. The study area encompasses all land within historic parish boundaries (based on 1851 Ordnance Survey) associated with the principal historic settlements likely to experience direct or indirect effects arising from the expansion of Heathrow (see Figure 2-1). The study area may be further extended to cover wider setting issues, such as aligning spatial boundaries to coincide with visual 'zone of theoretical visibility' (ZTV) and noise contours, as they are defined during further analysis. Where features of recent date, or potentially of prehistoric date, cross cut the parish structure these will be considered.

Nested hierarchy

1.7.2. A hierarchical approach to characterisation of the landscape will deliver three levels of characterisation, with a trend towards increasing detail and finer resolution (see Figure 1-1).

1.7.3. Research will be commensurate with the resolution of character analysis.

1. Level 1 Outline Assessment - Historic Landscape Characterisation: setting out the socio-economic narrative that defines the character of an area or historic land-use. This will comprise an HLC with a focus on the

evolving land-use history.[9] It will be used to set out character types, areas and the sub-character areas, supplemented by a written report.

2. Level 2 Rapid Assessment - HAA: focusing on settlements and areas potentially susceptible to the impact from the expansion of Heathrow. The HAA will require a degree of research involving varied primary historic sources.
3. Level 3 Detailed Assessment - Targeted HAA: used in areas of known or potential historic importance which will be directly impacted by the expansion of Heathrow. It will involve detailed research to inform the appraisal of character. The level of detail will be in proportion to the potential significance of the assets and the nature of the impact.

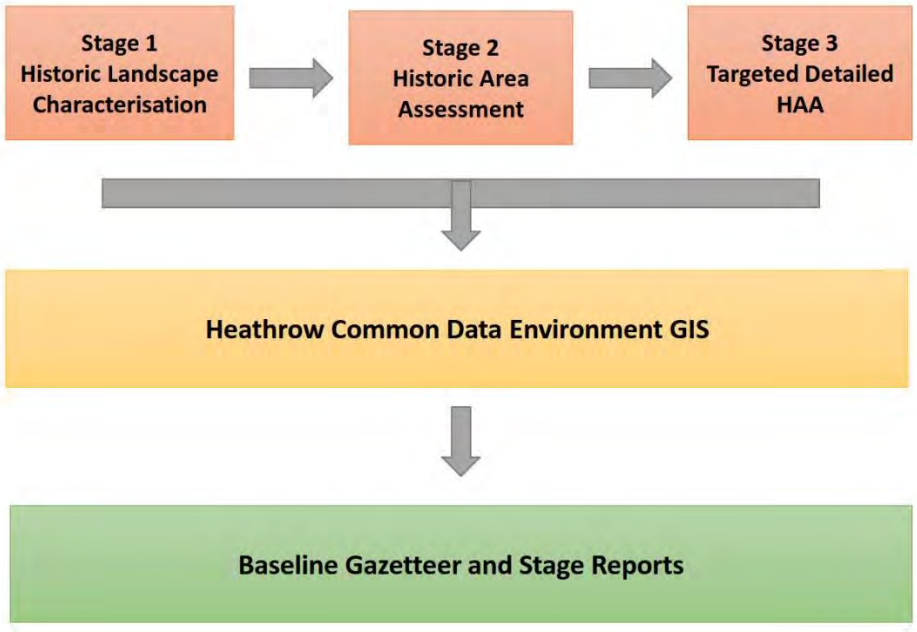


Figure 1-1 Indicative assessment process diagram

Historic character areas

1.7.4. Characterisation will involve describing and mapping discrete areas based upon a process of identifying historic landscape character types.[10] Character types will be defined at two levels, so that character area map analysis is performed at both a broader and a more refined level of detail – i.e. 'HLC broad types' will encompass a set of more specific 'HLC sub-types'. This

[9] Historic Areas Assessments are based on guidance within Understanding Place: Historic Area Assessments[8].
[10] Historic England, Using Historic Landscape Characterisation, 2004.

provides a consistent baseline that is compatible with other county level or sub-regional HLC datasets.

1.7.5. Whilst drawing on established HLC broad type classifications[10], additional sub-character types will reflect the circumstances within the study area. This will reflect the varied nature of the Heathrow landscape, including the extensive 20th century contribution to historic character. For instance, there will be an international airport broad type, with associated sub-types that reflect attributes of the evolving Heathrow configuration.

1.7.6. For each historic landscape character sub-type, a distinct and recognisable common character will be defined against specific historic landscape attributes identified from the initial broad-type mapping.

1.7.7. Individual character areas will be mapped to reflect the distribution of character type based on distinguishing attributes present across the study area. Areas will be based upon the homogeneity and predominance of landscape types. Character areas will be mapped to their full extent, whether or not they cross historic or current administrative boundaries.

1.7.8. Heritage significance will be assigned to each character area to provide a baseline value from which the impact of the Heathrow Expansion will be assessed in the EIA. Where areas are demonstrated to be of low or negligible historic character value, they will be scoped out of the EIA process.

Heritage assets

1.7.9. Heritage assets are primary attributes used to define historic character type. As defined in Annex 2 of NPPF heritage assets include: 'A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage asset includes designated heritage assets and assets identified by the local planning authority (including local listing).'

1.7.10. NPPF also defines designated heritage assets in Annex 2 as "World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation." In addition, the Draft Airports NPS additionally defines Protected Military Remains as designated heritage assets.

1.7.11. Alongside statutory designations, other heritage assets may have recognised value as archaeological areas, locally listed buildings or important hedgerows (Hedgerows Regulations 1997).

1.7.12. Archaeological sites, monuments and landscapes form a key component of the heritage resource although they are not always identified through statutory designation. However, they form an important component of the heritage baseline, such as the major prehistoric landscape identified in the Thames

Valley and at Heathrow. Non-designated heritage assets are not directly defined within the NPPF however the phrase “non-designated asset” is used within the policy text. A non-designated heritage asset should be considered as an asset that fulfils the definition of heritage asset as “having a degree of significance meriting consideration in planning decisions” but are not included in the list of designated assets[5].

1.7.13. Guidance on the identification of heritage assets is provided Appendix A.

2. Methodology

2.1. Level 1 Outline Assessment: Historic Landscape Characterisation

Scope

2.1.1. The primary historic landscape character analysis is structured on historic parish administrative units that covers Heathrow and its surrounding landscape. The study area includes eleven historic parishes: Cranford, East Bedfont, Harlington, Harmondsworth, Horton, Iver (part), Langley Marsh (part), Stanwell, Staines (part), West Drayton and Wraysbury (see Fig 2-1). The purpose using parish boundaries is to provide a meaningful boundary around the airport rather than simply impose a fixed radius. There are obvious cases where both modem developments and prehistoric archaeology will cross these boundaries.

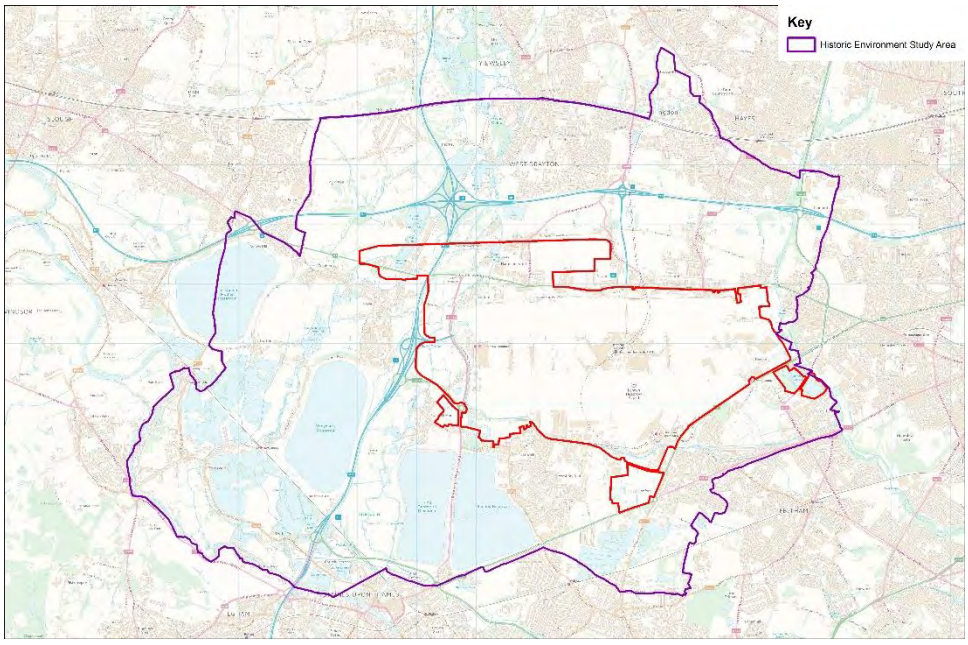


Figure 2--1 Characterisation study area (based on 1851 parish boundaries)

2.1.2. In addition to the parish character assessment, four themed landscape topic assessments will further examine the character contribution of locally significant historic land use management and arrangement formerly or currently prevalent across parish units:

1. Rivers and waterways (including references to bridges and mills);
2. Heaths, moors and woodland;
3. Non-airport transport

2.1.3. The exact detail and coverage of these papers will be considered during the HLC Level 1 research.

2.1.4. The Historic Parish and Themed Landscape Topic Outline HLC Level 1 assessments will:

1. Describe the outline land-use history and socio-economic development;
2. Distinguish broad historic landscape character types and define sub-types pertinent to the historic narratives and themes that apply to the Heathrow study area;
3. Incorporate existing HLC data sets sourced from county HLC studies, and critically review this data identifying strengths and weaknesses sourced from the Greater London Archaeology Advisory Service (GLAAS), Berkshire, Buckinghamshire, Surrey and the Colne Valley Park Historic Landscape Characterisation, resolving variance in character type definitions and mapping parameters;
4. Provide distinguishing attributes for the character types identified;
5. The presence of known, non-designated heritage assets – archaeological monuments, data sourced from Historic Environment Records, the aerial photographic interpretation (detailed in Appendix C), locally listed buildings and locally designated archaeology areas, will be recorded in the GIS proformas for an area.
6. Digitally map character areas to develop a broad understanding of the variable nature and quality of heritage significance displayed at the landscape scale. This includes areas of prehistoric archaeology that are likely to be present at a landscape scale across the study area;
7. Provide a report for the character areas and land-use history of the study area and themed landscape topics. The exact format of the final report from this research will be determined during the research.

Approach

2.1.5. The Level 1 HLC will follow the approach outlined in Historic England's guidance publications Using Historic Landscape Characterisation[10]. A recent HLC method statement has been produced by Oxfordshire County Council and will be used to supplement Historic England's guidance where appropriate[11]. The assessment will characterise different areas of land-use on a parish by parish or landscape topic basis, to generate geographical spatial data using an appropriate geographic information system (GIS). The mapped data will represent the pattern and grouping of landscape attributes (character types) that reveal the distribution of similar historic land use and associated processes (character areas).

2.1.6. Boundaries to the mapped character and sub-character areas will be categorised according to broad date of origin. This data will complement the character descriptions, providing structured evidence for the evolution and durability of historic land divisions and their influence on landscape forms

[11] Oxfordshire County Council, Thompkins A., Oxfordshire Historic Landscape Characterisation Project, 2017

prevalent within the study area. Based on their earliest appearance in historic map sources (see table 2-2) boundaries will be categorised as:

1. Pre-1757 (Rocque period maps and mid-18th century county maps);
2. 1757-1819 Pre-Parliamentary Inclosure Act (early 19th century manuscript sources, including Ordnance Survey One inch to mile 1780s-1840 and other manuscript sources);
3. Post-Inclosure 1820-1940 (Ordnance Survey maps from first edition to 1940); and
4. Post 1940s.

2.1.7. This approach provides a fully characterised landscape area and boundary analysis that also contextualises the higher resolution historic area assessment, to be developed in Levels 2 and 3. The GIS approach also ensures flexibility and allows further refinement of character types through Level 2 or 3 survey, or extension of the study area, as necessary.

2.1.8. The study will focus on the eight historic parishes that incorporate and surround the expansion of Heathrow, but will also involve themed landscape topic studies. Reports setting out the historic landscape character or themed landscape topic, will include, in addition to key historic land-use character types, a summary socio-economic narrative relevant to the subject focus and an understanding of the scale and nature of temporal and spatial landscape change. By referencing long-term tenurial/ administrative units originating in the 12th/13th centuries (principally the historic parish units), that, until the late 19th century, reflected socio-economic processes that influenced historic settlement and rural land-use, the assessment will highlight:

1. Potential pre-existing landscape features or boundaries that may have influenced the demarcation of the historic parish boundaries;
2. Major scale landscape changes associated with 19th and 20th century urbanism.

2.1.9. The heritage significance of character and sub-character areas will be assigned through the recording process. This will be informed by information compiled during the character analysis, primarily with regard to archaeological (evidential), historic and architectural interests.

2.1.10. The Heathrow area has experienced major changes throughout the 20th century, not only with the creation of an international hub airport, but also a connecting motorway transport network and associated development. Character types will be defined that recognise the historic landscape contribution of mid-late 20th century infrastructure and other forms of urbanism. Where information on former historic landscape features is identified this will be used to inform potential green infrastructure design.

Method

2.1.11. The Level 1 HLC will involve systematic identification and description of the contemporary rural and urban landscape, previous character will be described, mapped and characterised to capture time depth within the landscape. Each parish will be divided into character areas following guidance set out in Using Historic Landscape Characterisation[10]. It is recognised that types and character will cross parish boundaries. This involves grouping landscape character types by their attributes. At a high-level, areas will be characterised by broad types as defined within the national guidance and set out in Table 2-1. The broad series HLC types allow for characterisation to be referenced at a regional level to existing local HLC studies, i.e. the Colne Valley Regional Park HLC and Surrey County HLC.

2.1.12. Broad types will be sub-divided and classified using professional judgement informed by the character and narratives specific to the Heathrow landscape. In most circumstances, character sub-type nomenclature will follow that detailed in the Forum on Information Standards in Heritage[12].

2.1.13. Character areas will be digitally mapped to create GIS polygons. These will include metadata (a set of attributes) assigned by completion of a Level 1 survey proforma for each broad character type and sub-type. Template proforma worksheets are provided in Appendix B section 7.1.2.

2.1.14. Metadata, detailing broad date of origin, present attributes and 'previous character types', will also be assigned to the mapped boundaries that delineate character areas. Metadata will include an audit trail showing who has created the record, modified the record and the dates of changes.

2.1.15. The digital mapping and metadata will form a digital database of character areas and boundaries. This will be supplemented by a series of parish HLC outline reports that summarise the evolution of settlement and land use. Each report will be reference historic parish boundaries as defined by Ancient Parishes of England and Wales, 1500-1850 (see Figure 2-1).

2.1.16. The reports will detail the systematic map regression and analysis of selected secondary source information, used to generate the digital data. Selected data sources are provided in Table 2-2 below, however, these are meant as a guide and additional source data should be used where pertinent. The analysis and reporting will follow guidance outlined in Understanding Place: Historic Area Assessments[13] and the Victoria County History (VCH) guidance on writing parish and urban history[14] with existing VCH parish summaries providing a key

[12] Forum on Information Standards in Heritage (FISH), Historic Characterisation Thesaurus, 2015
[13] Historic England, Understanding Place: Historic Area Assessments, 2004
[14]Victoria County History 'Writing for the VCH' website https://www.victoriacountyhistory.ac.uk/writing-for-the-vch, consulted 2017 (accessed 03 May 2018)

source of information. Further details on reporting are outlined in Section 3.3 below.

HLC Broad Types	• Unenclosed or unimproved land • Enclosed land • Woodland • Industrial land • Mineral extraction • International Airport • Military • Ornamental • Recreational • Settlements • Orchards • Communications • Transportation • Water and valley floor • Water bodies

Table 2-1: Broad HLC types (adapted from Historic England, 2004)

Data sources

2.1.17. Georeferenced spatial data for each character area will be mapped on the current OS Masterplan base.

2.1.18. It is proposed to use 1851 parish boundary digital mapping sourced from Southall and Burton (2004) for the demarcation of historic parish boundaries.

2.1.19. The parish HLC outline reports will use relevant VCH studies as a key resource. The origins of the parishes located within Middlesex will also reference the analysis provided by Phillpotts landscape evolution study for Heathrow Terminal 5.[15] The origins of other parishes, historically part of Buckinghamshire, will be reviewed within the framework described by Phillpotts.

2.1.20. Fieldwork data is not anticipated necessary to deliver the Level 1 landscape characterisation across the study area, but will make recommendations that inform the scope of fieldwork to be undertaken during Level 2 and 3 surveys. Where necessary site visits will be made to areas of each narrow HLC type to take illustrative photographs and gain an understanding of the character. Such fieldworks will be combined, where possible, with fieldwork for the Level 2 and level 3 reports.

[15] Phillpots C., BAA Heathrow, Landscape Evolution in the Middle Thames Valley, Heathrow Terminal 5 Excavations Volume 2, Documentary Research Report: Section 22, 2011

Core data	Format	Location
Vertical aerial photographs	GIS and hard copy	National archive / Heathrow archive
LIDAR survey	GIS	Environment Agency / Heathrow archive
OS Raster Map 1:10,000	Digital	Heathrow database
OS MasterMap	Digital	Heathrow database
A map of the County of Middlesex Reduced from An Actual Survey in four sheets by John Rocque 1757	Digital	Online archive
A topographic Survey of the County of Berks, 18 Sheets John Rocque 1761. Mid 18th century maps for Buckinghamshire	Hard Copy	National Archive/Local Record Office
OS 2 inch drawings from the early 19th century	Digital	British Library Online Archive
OS 1st edition 6" maps	Digital	Online archive
OS 2nd edition 6" maps	Digital	Online archive
OS 1938 map sequence	Digital	Online archive
Victoria Country History (Middlesex and Buckingham)	Digital and hard copy	Online archive and National archive
Phillpotts: Landscape Evolution in the Middle Thames Valley, Heathrow Terminal 5 Excavations, Volume 2, Section 22, Documentary Research Report	Digital	Online archive
Ancillary data	Format	Location
Enclosure maps	Hard copy	National archive / Local Record Office
Tithe maps	Hard copy	National archive / Local Record Office
Estate plans	Hard copy	National archive / Local Record Office
Geological maps	Digital	Online archive
Historic Environment Record (HER) database	Digital	Local Authority database
National Heritage List for England (NHLE)	Digital	Online archive
Regional and period studies	Hard	Local Record Office
Landscape history studies	Hard	Local Record Office

Table 2-2: Example sources for Level 1 outline assessment.

2.2. Level 2: Rapid Historic Area Assessment

Scope

2.2.1. Rapid HAA characterisation, mapping and reports will focus on Heathrow and historic settlements, and relevant associated sub-areas characterised during Level 1, that might be susceptible to the expansion of Heathrow. This includes but is not limited to: East Bedfont, Heathrow Airport, Horton, Poyle, Stanwell, Stanwell Moor and Wraysbury. In cases where it is anticipated that the expansion of Heathrow will result in an additional significant effect on an area of heritage value, then a further Level 3 detailed assessment will be undertaken.

2.2.2. Areas currently expected to receive greater impacts from the airport development will directly undergo a Level 3 detailed HAA assessment without the need for the Level 2 process. It is anticipated that significant level 3 survey locations, are Colnbrook, Cranford, Harlington, Harmondsworth, Longford and Sipson. Accordingly, these areas are exempt from the Level 2 survey. Where existing documentation detailing the character and significance of the historic area exists this will be appraised for quality and, where possible, used to inform assessment.

2.2.3. There may be further areas that will require Level 3 assessment as identified through the Level 2 reports. The anticipated Level 2 and Level 3 areas of assessment are mapped in Figure 2-2 below.

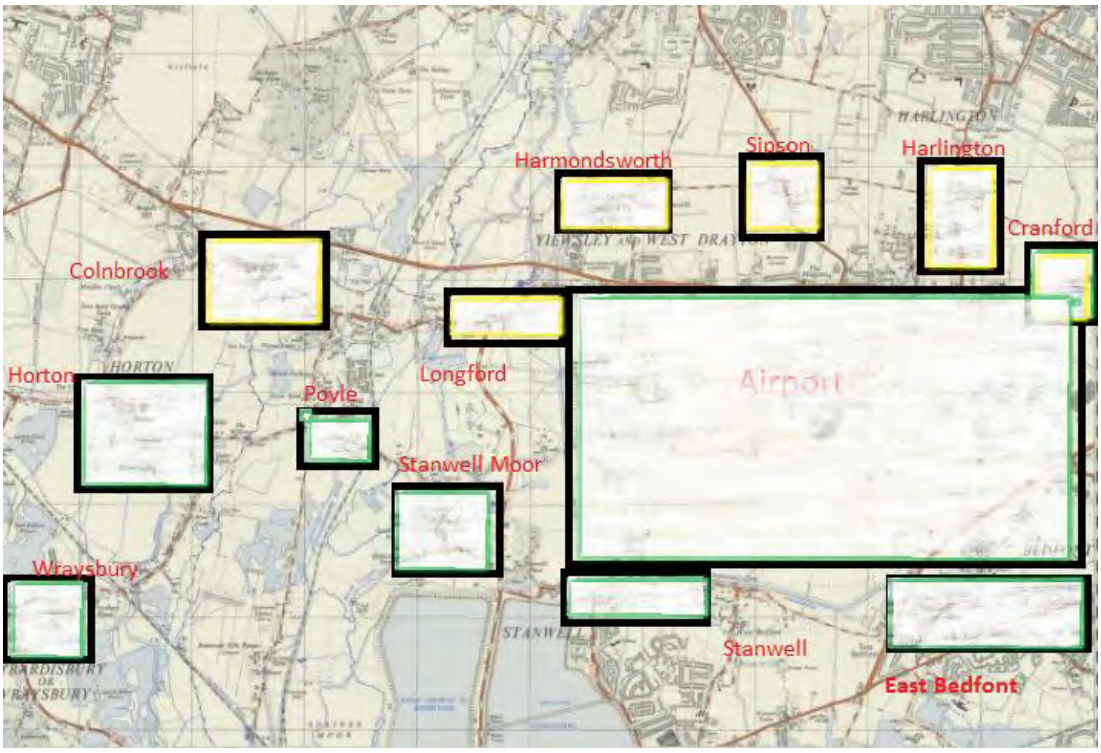


Figure 2--2 Anticipated HAA (green-Level 2 rapid HAA: yellow-Level 3 detailed HAA)

2.2.4. The study area boundaries for each Level 2 and 3 HAA will be defined by the results of the Level 1 characterisation. Within historic settlement areas the spatial scope will focus on built heritage, but may extend into the surrounding landscape if there are attributes relevant to understanding the settlement form. In some, patterns of development or barriers such as rivers, motorways and rail lines may form suitable boundaries, or may be incorporated into the HAA for the relevant settlement. In other areas, such as those defined by archaeological character, various attributes pertinent to heritage significance may be more appropriate.

2.2.5. Level 2 Rapid HAA assessments will:

1. Describe the historical development, identifying the main drivers of change;
2. Refine, where appropriate, character areas described during the Level 1 reports and describe additional sub-character type attributes;
3. Identify the present range of landscape and building attributes, their dates and forms, and relate them to the wider development of the area;
4. Provide individual records of heritage assets in the area that have been identified as having value, where necessary, or to expand or correct existing data;
5. Draw upon a wider range of evidence, including primary documentary sources;
6. Digitally map, using GIS, key features contributing to historic character areas, including, where appropriate, individual assets.
7. Identify and assess heritage significance of the assets and character areas.

Approach

2.2.6. The Level 2 Rapid HAA will follow the assessment process described in Historic England's guidance Understanding Place: Historic Area Assessments[13]. The assessment is largely based on historic mapping, field observation and secondary documentary sources. Primary documentary research, if required, will be proportionate rather than exhaustive. Where existing assessment documents, such as conservation area appraisals, have been identified these will be critically assessed and used to inform work where possible.

Method

2.2.7. The Rapid HAA will follow from the Level 1 HLC and focus on areas where there is a potential impact associated with the expansion of Heathrow, defined with reference to masterplan or relevant design documents available via the Heathrow Common Data Environment GIS.

2.2.8. The methodology will follow the principal of characterisation applied to Level 1, but with a higher resolution of detail leading to identification of specific features or assets that contribute to historic character. Each feature or asset will be assessed using the proforma template in Appendix B Section 7.1.3 and digitally mapped in GIS by creating GIS polygons. Data generated from proforma recording will be attached as attributes to the GIS polygons. Level 2 data will be stored as a separate GIS layer.

2.2.9. This information will be included in a report that describes the historical narrative of the character and development, key heritage assets and heritage value of each identified settlement area. It will include photos and illustrations, a gazetteer of known and new heritage asset records and mapping to show the location of the heritage assets. The report will also assess heritage significance of the assets and character areas. Further details on reporting are outlined in Section 3.3 below.

2.2.10. The Rapid HAA assessment will delineate character and sub-character areas based on divisions and development patterns, with reference to the historic narrative relevant and specific to each Rapid HAA study area. The historic environment character of an area is defined in Historic England guidance Understanding Place: Historic Area Assessment[13] as:

1. Topography and landscape elements, including relief and aspect
2. Layout: parcel (field or plot) size, shape and land use; regularity and density of street pattern; disposition of buildings in relation to plots, sight-lines and street width; building scale and density
3. Buildings: functional types; morphology, including plan-forms and roof shapes; architectural styles, features and motifs; prevalent building materials
4. Enclosure and definition of open spaces; linear routes (e.g. roads, waterways, railways); physical boundaries (e.g. walls, hedges, railings)
5. Designed landscapes: ornamental structures, earthworks, sculpture and water features; planting schemes (public and private); naturally occurring trees and vegetation; park furniture.

2.2.11. Elements of setting and context will also impact on how a place is experienced and valued. These are not always constant, but consideration must be given to factors such as:

1, Dynamism and activity, including traffic or people
2, Senses, including noise and scent
3, Daily and seasonal variations, including a rush hour, market or ceremony

2.2.12. Level 2 assessment will identify where buildings, neighbourhoods, landscapes, features or other assets have historic interest and assign a heritage value. Appendix A sets out guidance on the identification of heritage assets and assigning value.

2.2.13. Level 2 assessment will also identify areas where additional research is required through a Level 3 Detailed HAA. It will only be necessary to undertake detailed assessment where there is the potential for significant impacts as a result of the expansion of Heathrow. The requirement for further assessment will be assigned incrementally as follows:

1. High: potential of heritage significance unknown and requires further assessment;
2. Medium: known heritage significance but requires further assessment to identify attributes of value;
3. Low: known heritage significance and attributes of value identified
4. Nil: area of negligible or no heritage value.

Fieldwork

2.2.14. Limited fieldwork will be required during the Level 2 Rapid HAA. The aim of fieldwork is to ground-truth records and gain an understanding of the areas in question. This will be undertaken from publicly accessible land.

2.2.15. Suitably qualified heritage professionals will survey an area using mapping data generated following initial Level 2 data collection, including proforma recording sheet data (see Appendix B. 7.1.3).

Data sources

2.2.16. Alongside the Level 1 sources (Table 2-2) an additional list of examples HAA sources is provided in Table 2-3 below. This is not an exhaustive list, but is meant as a starting point to be expanded as appropriate. Where appropriate, initial research will be supplemented by field survey to supplement and support the desk-based sources.

Cartographic and pictorial documents	• Online street view • Ordnance Survey maps, as detailed scale as possible • Early maps, tithe, enclosure and estate plans (where readily available).
Historic Environment databases and documents	• Historic Environment Records (HER) • National Heritage List for England (NHLE) • Historic England Archive • Aerial Investigations and Mapping (AIM) • Conservation area appraisals • Townscape or landscape characterisation studies • List of locally important buildings • Archaeological survey data • Grey-literature reports • Archaeological data service (ADS) • Portable Antiquities Scheme (PAS) • Local authority Local Plans, (including land use planning maps) • 20th century mapping/ town and regional plan maps.
Remote sensing data	• Aerial photographs held by Heathrow and at relevant repositories • LiDAR data produced by Heathrow.
Secondary sources	• Regional and period studies • Landscape studies • Research frameworks • Historic Images • Relevant publications (Buildings of England volumes, Victoria County History and RCHME inventories, for example) •

Table 2-3: Example Level 2 assessment sources.

2.3. Level 3: Detailed Historic Area Assessment

Scope

2.3.1. Detailed assessment will be targeted on areas of known or potential heritage value that could be directly or indirectly impacted by the expansion of Heathrow. The Detailed HAA assessment will be used to enhance the baseline for the purpose of refining design and assessing impact.

2.3.2. In some cases, the expected level of significance or the potential impact from the expansion of Heathrow will mean detailed assessment is deemed necessary from the outset. It has been anticipated, in consultation with Historic England, that this will be the case for Harmondsworth and Longford that are located within the area of land take, and Colnbrook, Cranford, Harlington and

Sipson, located within the immediate surrounds. These areas are not intended to be subject to a Level 2 Rapid HAA assessment due to their significance already being identified. These areas of known heritage significance require further detailed Level 3 assessment to identify attributes of value within them.

2.3.3. The Detailed HAA assessment will:

1. Refine, where appropriate, character areas described during the Level 1/2 reports and describe additional sub-character type attributes;
2. Identify the range of landscape and building types, their dates and forms, and relate them to the wider development of the area
3. Provide individual records for all buildings (or building groups) and landscapes in the area, describing characteristics and condition.
4. Describe the historical development narrative, identifying the main drivers of change
5. Provide a summation of one or more epochs for the historic area and interpret the influence on the present landscape or area.
6. Draw upon a wide range of evidence, including interrogation of primary documentary sources, secondary sources, site visits and internal surveys of buildings where possible.
7. Digitally map areas, and selected individual assets, using GIS.

Approach

2.3.4. The Level 3 Detailed HAA will equate to a Level 3 assessment described in Historic England's guidance Understanding Place: Historic Area Assessments[13]. Baseline research will include a review of information gathered during the Level 1/Level 2 assessments. The scope of Level 3 baseline research will be proportionate to the heritage complexity, significance and the impact of the scheme.

Method

2.3.5. The Level 3 assessment will further refine character areas and sub-character areas, following the same principal and methodology outlined at Level 2 (2.2.7-2.2.12), however it will apply in-depth research to inform assessment of significance and condition. This will involve systematic research of primary and secondary sources combined with fieldwork survey. Alongside the Level 2 sources (Table 2-2) an additional list of example data sources is provided in Table 2-4 below. Each feature or heritage asset contributing to historic character will be recorded using the proforma template in Appendix B Section 7.1.4. Character areas will be digitally mapped in GIS and include meta-data generated from the template.

2.3.6. Level 3 assessment will require the creation of records for individual assets, such as buildings or upstanding archaeological remains. Furthermore, the level of recording may be detailed for individual asset with a complex development history or where detailed research is required to understand its

value. In all circumstances, individual assets should be characterised to inform the wider understanding of an area's development.

2.3.7. A Level 3 report will summarise the assessment findings. The report will describe the character, historical development, key historic features and heritage assets and the heritage value of the area. The report will use a narrative approach to present the development history of the area. Assets and areas of heritage significance will be identified within the report and heritage values applied to such areas. The report will include photos and illustrations, the gazetteer of asset records and mapping to show the location of assets. Further details on reporting are outlined in Section 3.3 below.

Fieldwork

2.3.8. For Level 3 assessments, fieldwork will be necessary for all areas being assessed. Site investigation will help to identify whether heritage value is still apparent on the ground and to identify any further heritage value or alteration not evident in the documentary sources.

2.3.9. A suitably qualified heritage professional will undertake the fieldwork assessment following the initial documentary research and using proforma spreadsheets (see Appendix B Section 7.1.4). The forms will be used to produce the meta data uploaded into a GIS database.

2.3.10. Printed maps of each area will be produced for annotation on site. Mapped data will include initial Level 3 data using GIS, and the fieldwork will be used to check the extents and character.

2.3.11. In some cases, internal inspections of buildings or intrusive investigation may be required to inform the assessment of significance and condition. This will be arranged where possible. All access arrangements will be made through the Heathrow land access team.

Data sources

2.3.12. A list of example sources is provided in Table 2-4 below, this is not an exhaustive list but meant as a starting point to be expanded as appropriate for the asset and location.

Local heritage	• Local authority archaeologists • Local authority conservation officers • Local interest groups
Historic Environment databases and documents	• Historic Environment Records (HER) • National Heritage List for England (NHLE) • Aerial Investigations and Mapping (AIM) • Historic England Archives • Conservation area appraisals • Townscape or landscape characterisation studies • List of locally important buildings • Archaeological survey data • Grey-literature reports • Archaeological data service (ADS) • Regional inventories • Public and private collections • Portable Antiquities Scheme (PAS) • Local authority Local Plan
Historical documents	• Charters • Registers • Manuscript collections (secular and ecclesiastical) • Deeds • Wills • Estate papers • Electoral rolls • Contemporary publications • Planning Records
Cartographic and pictorial documents	• Ordnance Survey maps, as detailed scale as possible • Early maps, prints and paintings • Tithe, enclosure and other parish maps • Estate plans • Historic Images
Remote sensing data	• Aerial photographs held by Heathrow and at relevant repositories • LiDAR data produced by Heathrow.
Geotechnical information	• Borehole and test pit logs • Site surveys • Geological maps
Secondary sources	• Regional and period studies • Landscape studies • Research frameworks • Studies of particular building types • Historic Images

	• Relevant publications (Buildings of England volumes, Victoria County History and RCHME inventories, for example) • RIBA archives • Local authority planning records

Table 2-4: Example Level 3 assessment sources

3. Deliverables

3.1. Database and GIS

3.1.1. Data will be Building Information Modelling (BIM) compliant. It will be gathered and collected as GIS shapefiles and stored as feature classes within an online geodatabase which will be managed within the Heathrow Expansion Project common data environment (Heathrow CDE).

3.1.2. The historic environment character assessments will adhere to the standard approach of data delivery, set out in the BIM execution plan. Standardised metadata implementation procedures are integrated into the CDE and will be applied through each publishing level. Mapping and spatial data deliverables will conform to the agreed standard templates to ensure a consistent approach on all Heathrow assessments. Although integrated into the Heathrow CDE, archiving and dissemination of outputted data from the project will be discussed with relevant local authority HERs and other data recipients/curatorial bodies to ensure a useful legacy is provided.

Templates

3.1.1. Proforma templates are provided in Appendix B to be used on the Level 1 HLC and Level 2 and 3 HAA assessments. Recording will be undertaken directly into the Heathrow CDE GIS system. Where data is recorded in the office this will be done via a live link to the CDE GIS system. Offline data editing will also be available. Out of the office recording will be undertaken with a specialist application on tablet computers, which will enable data to be inputted and synced directly to the Heathrow CDE.

3.1.2. All historic environment data generated within the Heathrow CDE will utilise predefined form fields. This will enable consistent baseline data to be entered in both office and field settings. The digital data collection and storage approach also allows for cross disciplinary data integration and sharing, with the added potential of multiple source connectivity, centralised storage and archiving.

3.1.3. The templates are set out for the three stages of assessment and each stage expands on the previous. This will provide continuity of data collection and allow for progressive stages of assessment to be applied to an area, where necessary. In all cases, the assessment will start from the outline HLC, but can then be refined to an appropriate level for areas and individual assets.

GIS

3.1.4. Data will be spatially mapped using ArcGIS and made compatible with GIS standards set out in the BIM execution plan. The character areas and assets identified will be mapped point, line or polygon feature classes as appropriate.

Attribute fields associated with appropriate feature classes will include a unique identifier (UID) to facilitate linkage to relevant entries within the baseline gazetteer. The symbology used in mapping will distinguish the different types of character areas and heritage assets. The mapping and presentation will conform to project BIM standards.

3.2. Baseline gazetteer

3.2.1. The meta data generated through the Level 1 HLC and Level 2 and 3 HAA proforma templates will contribute evidence towards the baseline gazetteer. This will comprise character areas, sub-areas and assets covering built heritage, historic landscapes and archaeology. This will form a digital database of all assets that is linked to GIS mapping. The digital baseline will be used throughout the project and be used as a live document, this will allow for enhancement or updating of information during the project life cycle.

3.2.2. This HLC/HAA digital data comprises a core EIA baseline data set. The gazetteer will be included as part of the baseline reports (Historic Parish/Themed Landscape Topic HLC Reports and Rapid/Detailed HAA Reports), as documentation supporting the core EIA baseline data set. Gazetteer entries for each character area or asset will vary in detail depending on the level of assessment and the value of the heritage asset. Information will be proportionate to the level of detail required for assessment and the context of the potential impacts in relation to assess value.

3.3. Reports

3.3.1. Following completion of the characterisation process a series of reports will be produced to outline the assessment results:

1. Overarching HLC report placing the study are within its landscape context as characterised by surrounding county HLC data.
2. Level 1 HLC reports, each providing a summation of the socio-economic and land use history resulting from the Level 1 assessment;
3. Three themed historic landscape reports generated from the Level 1 HLC data;
4. HAA reports, based on settlements and areas that have been assessed at the Rapid Level 2 and Detailed Level 3 scope. These will vary in detail in proportion to the scale of potential impact, by the expansion of Heathrow, and the value of heritage assets.

3.3.2. The reporting will follow guidelines set out in the Historic England's guidance Understanding Place: Historic Area Assessments[13]. The reports will be presented in standard Heathrow A4 report templates and follow Heathrow report style guidance. The structure of the reports and content will vary depending on the stage of assessment but will normally include the following:

1. An executive summary that outlines the main findings

2. An introduction setting out the location, stage of assessment, purpose and context of the assessment
3. An illustrated narrative of the character area and sub-areas within, describing the socio-economic and historical development, including archaeological baseline of the area, based upon HER data, aerial photographic plotting and previous archaeological work, identifying principal features and assets, their form and chronology and social context, highlighting archaeological potential and other elements of the landscape
4. A summary of the archaeological and heritage significance of the character area. The condition of assets, including those of an archaeological significance, within the area indicating areas at risk or susceptible to change
5. A description of heritage significance, used to determine the value of assets and character areas
6. Recommendations for areas requiring further research, such as archaeological fieldwork
7. Mapping to represent all the character areas and assets covered within the report
8. Supporting photographs and illustrations where appropriate
9. A bibliography of all referenced material and sources consulted
10. A supporting gazetteer of records contained within the report study area, included as an appendix to the report.

Aerial investigation and mapping

3.3.3. An assessment of aerial photographs and aerial remote sensing technologies, such as lidar, will be undertaken to investigate the Heathrow landscape. The assessment will be used to identify unknown archaeological or historic landscape assets or better reveal the extent and form of known heritage assets. Sites can be seen as cropmarks, soilmarks, parchmarks or features such as earthworks or structures. A detailed methodology for the Aerial Photography data gathering and reporting is set out in Appendix C.

List Entry Review

3.3.4. In addition to characterisation the Level 2and Level 3 HAA reports will include recommendations for formal statutory designation review where appropriate, to ensure evidence supporting the DCO application takes proper account of the special interest of buildings and monuments of national importance, including undesignated heritage assets potentially of equivalent significance to scheduled monuments (Revised Draft Airports NPS s 5.189).

3.3.5. Historic England will be notified of any anticipated recommendations, with a request for additional guidance on information they require to meet the formal review process. Information will be supplied to Historic England based upon

templates sourced from Historic England concerning different categories of heritage asset.

4. Glossary of Terms

Term/ abbreviation	Description
Archaeological Asset	A site, deposit or artefact that holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point.
Heritage Asset	A site, landscape, deposit, structure or artefact of historical or archaeological interest.
Baseline	The existing historic environment by which things are measured or compared.
Built Heritage	The man-made structures within the historic environment.
Character Area	Unique and geographically discrete, sharing characteristics of the generic Character Type to which they conform.
Character Type	Distinct generic types of landscape that are relatively homogeneous in character and can be allocated to a number of locations.
Character Sub-Type	Distinct generic types of a broader character type.
Communications	A Broad Character Type relating to land used for exchanging of information.
Designated Asset	A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation (NPPF, 2012).
Development Components	Individual discrete elements of the wider proposed development such as runways, roads or landscaping.
Direct Effect	Effects that directly and physically impact upon a heritage asset.
Enclosed Land	Land that has undergone cultivation or demarcation for the purposes of ownership.
Heritage Interest	Aspects of an assets value. This may be archaeological, architectural, artistic or historic (NPPF, 2012).
Historic Environment	All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora (NPPF, 2012).
Historic Landscape	A landscape that has been developed, changed, used and exploited by people over time.
Indirect Effect	Effects that can impact upon the experience of a heritage asset and its setting.
Industrial Land	Land occupied by manufacturing, and utility developments.
International Airport	Land occupied by an airport and ancillary structures which provide connection to other countries.
Land-use	What the land is physically used for.

Military	Of or relating to the armed forces.
Mineral extraction	Extractive industries, such as mining or quarrying including short-lived workings
Orchards	Enclosed land used for growing food producing trees.
Ornamental	Relating to land that has been designed as a decorative landscape.
Place	Any part of the historic environment, of any scale, that has a distinctive identity perceived by people (EH 2008, Conservation Principles)
Recreational	Relating to land that has been designed for public enjoyment.
Setting	The surroundings in which a heritage asset is experienced. (NPPF)
Settlement	Land occupied by a community of people.
Significance	The value of a heritage asset to this and future generations because of its heritage interest. Significance derives not only from a heritage asset's physical presence, but also from its setting (NPPF,2012).
Transportation	The movement of people or goods from one location to another.
Unenclosed or Unimproved Land	Farm land that has not been cultivated.
Value	An aspect of the worth or importance attached by people to qualities of places, categorised as aesthetic, evidential, communal or historical value (English Heritage Conservation Principles, 2008). These values provide an asset with heritage interest.
Water Bodies	An area of water forming a geographical feature.
Water and Valley Floor	A Broad Character Type relating to a long depression in the land surface, usually containing a river, formed by erosion or by movements in the earth's crust. The flat, wet lands to either sides of river are used as meadow or pasture.
Woodland	Land covered with trees.

5. Bibliography

Creator	Title	Publisher and place of publication	Date of publication
Department for Communities and Local Government (DCLG)	National Planning Policy Framework (NPPF)	DCLG	2012
Airport Commission	Airport Commission Appraisal Framework	Airport Commission	2014

Creator	Title	Publisher and place of publication	Date of publication
Department for culture, media and sport (DCMS)	Principles of Selection for Listing Buildings	DCMS	2010
Department for Transport (DfT)	Draft Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England,	DfT	2017
Forum on Information Standards in Heritage	Historic Characterisation Thesaurus (http://heritage-standards.org.uk/wp-content/uploads/2016/05/HistoricCharactFull_-Aug2015.pdf)	FISH	2015
Heathrow Airport Limited	Understanding our heritage, section 5.6, In: Taking Britain Further: Heathrow's plan for connecting the UK to growth	Heathrow	2015
Historic England	Using Historic Landscape Characterisation	Historic England	2004
Historic England	Change and Creation: historic landscape character 1950 – 2000	Historic England	2005
Historic England	Conservation Principles and Guidance, London	Historic England	2008
Historic England	Understanding Place: Character and context in local planning	Historic England	2011 (revised 2012)
Historic England	Historic England Advice Note 7: Local Heritage Listing	Historic England	2012 (revised 2016)
Historic England	GPA2 Managing Significance in Decision-Taking in the Historic Environment	Historic England	2015
Historic England	Understanding Place: Historic Area Assessments	Historic England	2017
Parliament of the United Kingdom	Planning (Listed Building and Conservation Areas) Act 1990	Stationary Office	1990 (reprinted 2002)
PCA	Historic Environment Characterisation of Harmondsworth	PCA	2001
Phillpott, C.	Landscape Evolution in the Middle Thames Valley, Heathrow Terminal 5 Excavations Volume 2, Documentary Research Report: Section 22	Heathrow	2011

Creator	Title	Publisher and place of publication	Date of publication
Thompkins, A.	Oxfordshire Historic Landscape Characterisation Project	Oxfordshire County Council	2017
Southall and Burton	GIS of the Ancient Parishes of England and Wales, 1500-1850	UK Data Service	2004

6. Appendix A

6.1. Identifying the value of heritage assets

Identifying heritage value – Significance

6.1.1. Significance is defined as the value of a heritage asset to this and future generations because of its heritage interest. Such value might be derived from archaeological, architectural, artistic or historic values. Significance derives from the asset's physical presence and its setting, the areas in which the asset is experienced.

6.1.2. It should be noted that the design of the scheme is still in development with new options being explored. If new elements are added to the scheme, or the design changes in ways which may affect the scope of the expansion of Heathrow historic characterisation study, the identification of non-designated heritage assets process will be undertaken at the new locations, and the results added to the study database.

6.1.3. Once the geographic scope has been established, the following methods and resources will be used to identify non-designated assets using the criteria outlined below.

6.1.4. Criteria set out in the Historic England Advice Note 7 for Local Heritage Listing identify the degree of significance to warrant inclusion in the scoping and impact assessment process as a non-designated heritage asset.[16]

6.1.5. The practical application of these components is outlined in the Principles of Selection for Listed Buildings,[17] along with the individual selection guides for different asset types published by Historic England and Local Heritage Listing, Historic England Advice Note 7[16]. These criteria are applied to help articulate why a heritage asset is important and can be summarised as indicated in Table 5-1 below.

Criterion	Description
Age	The age of an asset may be an important criterion and the age range can be adjusted to take into account distinctive local characteristics
Rarity	Appropriate for all assets, as judged against local characteristics.

[16] Historic England, Historic England Advice Note 7: Local Heritage Listing, first published 2012, revised 2016
[17] Department for Culture Media and Sport, Principles of Selection for Listing Buildings, 2010

Aesthetic Interest	The intrinsic design value of an asset relating to local styles, materials or any other distinctive local characteristics
Group value	Groupings of assets with a clear visual, design or historic relationship
Archaeological Interest	The asset may contain evidence for past human activity in the form of buried remains, or within the structure or development and change of a building or landscape.
Evidential Value	The significance of a local heritage asset of any kind may be enhanced by a significant contemporary or historic written record
Historic association	The significance of a local heritage asset of any kind may be enhanced by a significant historical association of local or national note, including links to important local figures
Designed landscapes	Relating to the interest attached to locally important designed landscapes, parks and gardens
Landmark status	An asset with strong communal or historical associations, or because it has especially striking aesthetic value, may be singled out as a landmark within the local scene
Social and communal value	Relating to places perceived as a source of local identity, distinctiveness, social interaction and coherence; often residing in intangible aspects of heritage contributing to the “collective memory” of a place

Table 6-1: Guide criteria for local listing (Historic England, 2016)

6.1.6. The level of survival of historic fabric and character, along with the condition of an asset will also inform the decision as to whether something is a non-designated heritage asset, particularly where there are better surviving examples locally. Change and adaptation of an asset can also be considered to contribute to significance or interest in some examples. In the majority of cases, the visual and historic character of a heritage asset should be readily appreciable from an external visual inspection. Where buildings, structures or designed landscaped have been subject to a level of insensitive modern

alterations, or intrusion into their setting, that have removed original features and context, and consequently the ability to understand the historic nature and character of the asset, these are unlikely to be considered to be non-designated heritage assets. For example, where a terrace has been subject to the insertion of modern windows, modern shopfronts, rendered brickwork, different roof coverings and poor extensions which remove historic features, symmetry and rhythm of the frontages.

6.1.7. There may be heritage assets where local historic or community associations override the loss of historic fabric and character. However, these will be exceptional cases and a clear case will be made for their inclusion, where required.

Assessing comparative value

6.1.8. All heritage assets will be assigned a comparative value. Designation is a key indicator of comparative heritage value. All designated assets are of national importance, with Scheduled Monuments and Grade I listed buildings considered to be of exceptional interest, Grade II* buildings are of more than special interest and Grade II buildings being of special interest. Conservation areas are also nationally recognised, although locally designated. However, it is possible that designated assets have been altered or had their setting impacted to the extent where their value assigned through designation is no longer relevant. With these assets, it is important to understand what individual heritage value is retained and assign them a comparative value accordingly.

6.1.9. Non-designated assets also need to be assigned a comparative value. Most non-designated assets will be of local value and assigned a comparative value accordingly, however specific, distinctive local features may contribute to significance. It is possible that non-designated heritage assets could be considered nationally important and reach the threshold for designation. Where this is the case, they will be assigned an appropriate comparative value.

Heritage assets will be assigned comparative values based on Table 5-2 below. Heritage value	Description
High	Heritage assets of international and high national importance, for example Grade I and II* listed buildings and scheduled monuments.
Medium	Heritage assets of moderate national importance and regional importance, for example Grade II listed buildings, conservation areas and sites of moderate archaeological resource which

	contribute to the understanding of historic development on a national or regional level
Low	Heritage assets of local importance including locally identified buildings and structures with surviving qualities in their fabric or historic associations or sites of limited archaeological resource which contribute to the understanding of local historic development.
Negligible	Heritage assets where the value is compromised by poor preservation, survival or contextual associations to justify inclusion is a higher grade.

Table 6-2: Comparative heritage values

7. Appendix B

7.1. Characterisation proforma recording sheets

7.1.1. The tables detailed in this section represent broad ideas for the recording of data within the Heathrow CDE GIS system. Data entry will be defined in the Heathrow CDE and detailed in the Compiler's Guide. Each unit of record will be a single polygon. The following table structure reflects that which shall be constructed within the Heathrow CDE.

7.1.2. Level 1 Historic Landscape Characterisation

Survey Reference	**XX**	**Date**	**XX/XX/XX**	**Surveyor**	**Jo Bloggs**
Historic Parish:					
Cranford / East Bedfont / Harlington / Harmondsworth / Horton / Langley Marsh / Stanwell / Wraysbury					
Unit of record					
Character area / complex / block / street / development / neighbourhood / building / other feature					
Broad character type					
Unenclosed or unimproved land / Enclosed land / Woodland / Industrial land / Military / Ornamental/ Recreational / Settlements / Orchards / Communications / Water and valley floor / Water bodies					
Sub character type					
Pasture / Scrubland / Meadow / Heath / Planned Enclosure… etc					
Attributes					
(Free descriptive text)					

Period of origin	Unknown	Confident From (date)	Confident to (date)	From (period)	To (period)	User defined (Y/N)
Designations	Scheduled Monument / Listed building grade I II* II / Conservation Area Locally listed / Parks and garden / London Square / None					
Previous type HLC						
Pervious broad type	(Insert as appropriate)					
Previous sub type	(Insert as appropriate)					
Period	(Insert as appropriate)					
Confidence	(Insert as appropriate)					
Notes	(Insert as appropriate)					
Sources						
Source ID	(Insert as appropriate)					

Source	(Insert as appropriate)
Specific reference	(Insert as appropriate)

7.1.3. Level 2 HAA

Asset details

Survey Reference	XX	Date	XX/XX/XX	Surveyor	Jo Bloggs
Historic Parish:					
Cranford / East Bedfont / Harlington / Harmondsworth / Horton / Langley Marsh / Stanwell / Wraysbury					
Unit of record					
Character area / complex / block / street / development / neighbourhood / building / other feature					
Broad character type					
Unenclosed or unimproved land / Enclosed land / Woodland / Industrial land / Military / Ornamental / Recreational / Settlements / Orchards / Communications / Water and valley floor / Water bodies					
Sub character type					
(Insert as appropriate)					
Attributes					
(Free descriptive text)					

Period of origin	Unknown	Confident From (date)	Confident to (date)	From (period)	To (period)	User defined (Y/N)
Designations	Scheduled Monument / Listed building grade I II* II / Conservation Area Locally listed / Parks and garden / London Square / None					
Address	**Place name/House number(s)**					
	Street name(s)					

Description

Asset type(s)	**Terraced house / villa / factory / park / sculpture / shop / workshop / warehouse etc**
Asset setting	
Age / Date:	
Phases of development:	
Materials:	
Heritage value	High / Medium / Low / Negligible

Value of further investigation:	High / Medium / Low / Nil
Summary notes	

Photographs

Primary elevation (general photograph)	

7.1.4. Level 3 Detailed HAA

Asset details

Survey Reference	XX	Date	XX/XX/XX	Surveyor	Jo Bloggs
Historic Parish:					
Cranford / East Bedfont / Harlington / Harmondsworth / Horton / Langley Marsh / Stanwell / Wraysbury					
Unit of record					
Character area / complex / block / street / development / neighbourhood / building / other feature					
Broad character type					
Unenclosed or unimproved land / Enclosed land / Woodland / Industrial land / Military / Ornamental / Recreational / Settlements / Orchards / Communications / Water and valley floor / Water bodies					
Sub character type					
(Insert as appropriate)					
Attributes					
(Free descriptive text)					

Period of origin	Unknown	Confident From (date)	Confident to (date)	From (period)	To (period)	User defined (Y/N)
Designations	Scheduled Monument / Listed building grade I II* II / Conservation Area Locally listed / Parks and garden / London Square / None					
Address	**Place name/House number(s)**					
	Street name(s)					

Description

Asset type(s)	**Terraced house / villa / factory / park / sculpture / shop / workshop / warehouse etc**
Asset setting	
Current use:	
Previous Use (If Obvious)	
Age / Date:	
Phases of development:	

Materials:	
Heritage value	High / Medium / Low / Negligible

Detailed description

Bays (width)	
Storeys (height)	
Roof form	
Basement/ cellar/ coal hole/ pavement lights (present or evidence for)	
Chimney (location/ gable/ centrally placed/ relation to front door)	
Windows (type, are they uniform over building?)	
Architectural Style	
Features of Interest	
Subsidiary buildings	
Extensions	
Associations (architect/builder/initiator etc)	
Detailed description **(continue on other sheets, as necessary)**	

Condition of building

	Condition					
Building elements	**Good**	**Fair**	**Bad**	**Not visible**	**Missing**	**Materials**
Roof						
Gutters and downpipes						
Walls						
Door						
Windows						
Architectural detail						
Boundary wall/ subsidiary features						
Additional building elements						

Photographs

Principal elevation (general photograph)	
Chimney location in relation to primary elevation	
Flank elevation 1 (give orientation)	
Flank elevation 2 (give orientation)	
Roof (detail)	
Window (detail)	
Door (detail)	
Building material detail/ brick bond	
Architectural feature/ string course, window heads, mouldings	
Setting (including streetscape)	
Associated boundaries/garden features	
Street furniture	
Other photographs as necessary	

Assessment

Criteria	Detail
Completeness (have parts of the building been lost or significantly changed, has a house been divided into flats or has the building had a significant change of use that may impact upon its fabric)	
Uniformity (do the features of the building i.e. windows/ doors rainwater goods etc. reflect the original period of the building or have they been changed)	
Condition (are the majority of building elements, where visible, or present, in good or fair condition)	
Date (broad assessment based upon map evidence and visible features of the building or other information, such as list entry or conservation area appraisal, where available)	

8. Appendix C

8.1. Aerial Analysis and Transcription Methodology

Introduction

8.1.1. It is proposed that an archaeological aerial analysis and transcription survey be undertaken for the Heathrow Expansion Project. This is also sometimes referred to as a remote sensing survey, aerial survey, or aerial investigation and mapping. This comprises the systematic analysis, interpretation, mapping and recording of archaeological features from modern and historic aerial photographs, as well as lidar imagery.

8.1.2. The aim is to accurately map and record the form and extent of archaeological features visible as cropmarks, soilmarks, earthworks or structures, to inform the baseline assessment of the cultural heritage resource. Although this assessment will be undertaken alongside the HLC and HAA work; it is intended that the results will contribute to the baseline assessment work as this analysis and transcription work progresses.

8.1.3. This document is intended as a brief overview of the proposed aerial analysis and transcription methodology, to assist in the project planning. A further, more detailed project design will not be produced.

National Mapping Programme

8.1.4. It has not yet been determined whether any part of the wider area around Heathrow has been previously surveyed in this way by Historic England's National Mapping Programme (NMP).

8.1.5. It is likely that the wider HER baseline study area (yet to be finalised) will protrude into Buckinghamshire, Oxfordshire, the Greater London Authority, and Surrey. This area appears to fall between the coverage of the Thames Valley NMP[18] project to the west, the Hertfordshire NMP[19] project slightly further to the north, and the Kent NMP[20] project some way to the south-east. This will need to be confirmed via a search request to the Historic England Archive.

8.1.6. It is possible that a number of additional small non-NMP (commercial) aerial investigation and mapping projects may also fall within the study area. If this data is available to the project team, it is likely that the aerial analysis and transcription of these areas will not be duplicated by our project.

[18] Fenner, V., Dyer, C. Thames Valley Project: A Report for the National Mapping Programme. Air Photography Unit, Royal Commission on the Historical Monuments of England (RCHME), 1994
[19] Fenner, V., Crop Marks in Hertfordshire: A Report for the National Mapping Programme. Air Photography Unit, Royal Commission on the Historical Monuments of England (RCHME), 1992
[20] Edis, J., The Classification of Cropmarks in Kent: A Report for the Monuments Protection Programme. Air Photography Unit, Royal Commission on the Historical Monuments of England (RCHME), 1989

Study area

8.1.7. The wider heritage baseline study area is yet to be confirmed as finalised, but is likely to include areas of Berkshire, Buckinghamshire, the Greater London Authority and Surrey (see Figure 8—1, below). It is envisaged that this will be based on historic parishes, to facilitate an understanding of the narrative of historic settlement in the area (see Section 1.7, above).

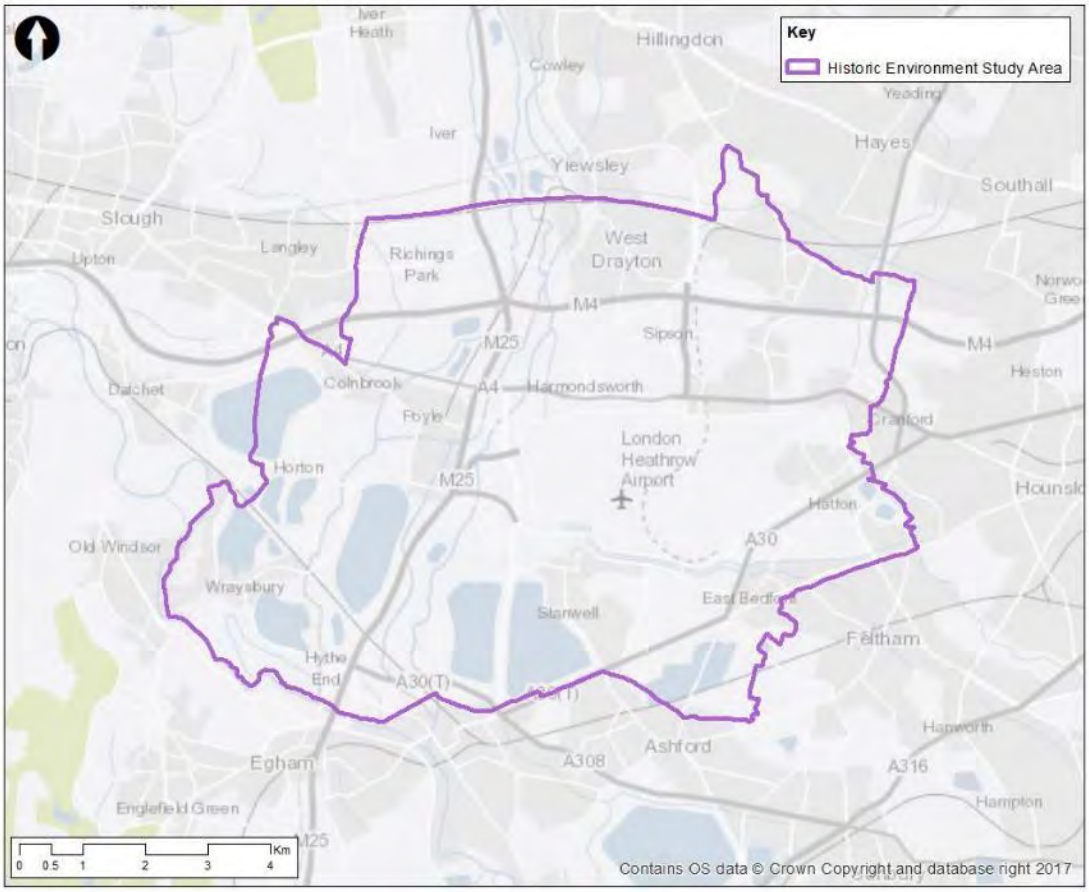


Figure 8--1 Characterisation study area (based on 1851 parish boundaries)

8.1.8. This encompasses a total area of approximately 75km^2, although not all of this will be subject to aerial analysis and transcription. This includes several areas of substantial gravel extraction already extant by the time of the earliest available aerial images. Any areas of previous NMP projects or other aerial analysis and transcription work will also be excluded (details yet to be confirmed).

8.1.9. The area of the Heathrow Terminal 5 archaeological excavations will not be included within the aerial analysis and transcription study area, due to the unnecessary duplication of data this would be likely to create.

8.1.10. The area of the historic WWII airfield (and a transcription documentation of its expansion over the subsequent decades) is not to be included within this aerial analysis and transcription project, as it does not fall within the areas of direct impact for the airport expansion. The expansion and development of the airfield and airport will be discussed elsewhere in the historic environment baseline assessment.

8.1.11. The total area within the polygon shown in Figure 8-1 to be included within the aerial analysis and transcription project is therefore likely to be approximately 60km^2. The precise extent of this area, with any exclusions clearly defined, will be detailed and illustrated in the final report.

Sources

Historic England Archive

8.1.12. All readily available historic vertical and oblique aerial photographs of the study area held within the Historic England archive will be consulted for this project.

8.1.13. Vertical aerial photographs were taken for non-archaeological purposes from approximately 1940 onwards, by organisations such as the Royal Air Force (RAF) and the Ordnance Survey (OS). These photographs often captured sites of historic interest incidentally, especially those shots taken in the first half of the 20th century, before archaeological remains may have been damaged or destroyed by the intensification of arable farming. In some areas, vertical photographs dating from even earlier are also available.

8.1.14. Historic oblique aerial photographs dating from approximately 1920 onwards usually targeted known sites of architectural or archaeological interest. They were typically taken at a much larger scale than the 'blanket' vertical aerial photography and were often timed to capture images of archaeological sites when they were at their most visible, i.e. when dry ground conditions favoured the development of clear cropmarks, or when low winter sun would reveal subtle earthworks.

8.1.15. All aerial photographs in the Historic England archive which fall within the study area will be viewed in person and examined stereoscopically and under magnification where applicable. Copies will be obtained with the use of a digital SLR camera where potential features are identified and the relevant photographs are considered to be of use either for transcription or reference purposes.

Cambridge University Collection of Aerial Photographs (CUCAP)

8.1.16. Projects of this type would usually include reference to vertical and oblique historic aerial photographs held within the CUCAP archive, in the same way as for the Historic England archive, above. The CUCAP collection however is

currently unavailable for consultation, while arrangements for its ongoing status are put in place.[21]

Historic Environment Records (HERs)

8.1.17. Aerial analysis and interpretation projects also routinely include reference to historic aerial photographs held by the local HER. Some HER aerial photographs duplicate those held at the Historic England Archive, though it is also often the case that unique collections deposited by local flyers are unavailable anywhere else. Some HER aerial photograph collections have been donated to the Historic England Archive. It will be necessary for this project to check with the local HERs whether that is the case or not.

Heathrow Archive

8.1.18. Heathrow commission an annual vertical aerial photograph survey for an area of 12km^2 centred on the airport itself. Since 2011 this has been fully digital and is captured to a spatial resolution of 10cm. Additionally, the Heathrow historic vertical photographs have also been fully digitised and orthorectified. These are available for every decade from the 1940s onwards, though not necessarily for each individual year in the case of the older photographs.

8.1.19. Although the historic Heathrow aerial photographs cover a smaller area than the modern annual survey, it is likely that historic coverage from the Historic England Archive was able to include areas closer to the modern Heathrow airspace than is currently the case. It is therefore likely that between the Heathrow and Historic England archives there will be contiguous coverage across the study area of at least some, if not all dates. Should any substantial gaps in the coverage be identified in the course of the project, this will be made clear in the report.

8.1.20. The Heathrow aerial photograph dataset can be viewed online via the Heathrow GIS viewer portal. If features of archaeological interest are identified this way then the relevant orthorectified GeoTIFF tile will be requested from the Heathrow Asset Management team. The orthorectification of this image will be refined if necessary, targeted on the specific area of interest. Height data (DTM) and OS Mastermap data will be supplied by Heathrow to the project team for this purpose. The source and accuracy of the height data supplied will be confirmed in the final report.

Lidar

8.1.21. Environment Agency lidar imagery is available for the study area at spatial resolutions of 50cm, 1m and 2m. There will be some airspace omissions within this dataset, due to the practicalities of surveying over of Europe's busiest airports. Lidar data supplied by Heathrow is likely to compliment the

[21] University of Cambridge, Cambridge air photos http://www.cambridgeairphotos.com/contacts/ (accessed on 27 July 2017)

Environment Agency lidar data by filling some, if not all, of the airspace gaps. Should any substantial gaps in the combined lidar coverage be identified in the course of the project, this will be made clear in the report.

8.1.22. The lidar DSM (Digital Surface Model) and DTM (Digital Terrain Model) data will be used to create the following advanced visualisation models within software called RVT (Relief Visualisation Toolkit) in order to aid the interpretation and transcription of the features observed:

1. Hillshade;
2. Multi-Direction Hillshade;
3. Slope;
4. Simple Local Relief;
5. Sky View Factor;
6. Anisotropic Sky View Factor; and
7. Openness (positive and negative).

8.1.23. All eight advanced visualisation models will be reviewed during the course of the analysis and interpretation, in combination with all other image sources. For accuracy, transcriptions will then be made only from the Openness models, as the others are proxy models of the landscape.

8.1.24. The DTM is lidar data that has been processed to provide a representation of the ground surface without objects such as vegetation or buildings. This means that archaeological earthworks can be revealed on the lidar imagery, even if they lie beneath areas of woodland. However, this can sometimes depend on the time of year the survey was undertaken, as a dense woodland canopy can slightly hinder data collection, even for lidar.

Modern aerial photographs

8.1.25. As noted above, high resolution (10cm) vertical aerial orthophotography commissioned annually by Heathrow is available for the purposes of this project. This covers an area of 12km^2, centred on Heathrow.

8.1.26. Additionally, Heathrow recently commissioned a drone survey of the airport perimeter. It is possible that this imagery will also be available as a source for the aerial analysis and transcription project, though it's suitability for this has not yet been assessed. It is not thought to be available online via the Heathrow GIS viewer portal, and it is not yet known whether this source is already orthorectified or not.

8.1.27. Modern vertical orthophotographs are also available for the entirety of the study area, in the form of ESRI World Imagery. It is possible that we may also be able to use both Google Earth and Bing imagery, though licencing restrictions for the use of these latter two datasets for commercial projects need to be investigated. This will be confirmed in the final report.

Historic Environment Record (HER) data

8.1.28. Monument and event records (where available) from the Buckinghamshire, Oxfordshire, Kent, and Greater London Authority HER databases will be obtained for the purposes of this project. These records will be used a s a reference to aid interpretation of features visible on remote sensed imagery. This may be either through the pre-existing identification of a visible feature, or by providing information that could help characterise the likely heritage potential of the area.

8.1.29. The HER data is likely to be supplied as vector data (points, lines and polygons), with identifying attribute data attached. Full monument and event record reports are also likely to be supplied as PDF documents.

National Record of the Historic Environment (NRHE) data

8.1.30. Monument and event records from the NRHE database will be obtained from Historic England for the purposes of this project. As with the HER data (above), this will be used as a reference to aid interpretation of features visible on remote sensed imagery. This data is also likely to be supplied as both vector data with identifying attributes attached, and as accompanying PDF monument and event records.

Cartographic sources

8.1.31. Historic OS mapping is an important reference source when assessing features visible on remote sensed imagery. This will be sourced by the project team as a part of the wider historic environment baseline assessment for the area. Generally, epochs 1-4 of the 1: 2,500 scale County Series maps are the most useful source when comparing with possible historic features visible on aerial imagery.

8.1.32. In general, where features such as field boundaries, trackways, extractive pits or ponds are marked on a historic OS map, they will not be mapped and recorded as part of this aerial analysis and transcription project. This is because the objective of this project is to add to the known record, not duplicate it. Nevertheless, where the full extent or form of a feature is not recorded in its entirety on the historic OS maps, it will be included in the transcription for this project.

Additional sources

8.1.33. Information on the underlying geology and soils should also be taken into account when reviewing aerial photographs for evidence of sub-surface archaeological remains, as this can affect the visibility of these features as soilmarks and cropmarks.

8.1.34. Information on the underlying bedrock and superficial geology will be obtained from the British Geological Survey Geology of Britain viewer.[22] Soil types can be reviewed via the Cranfield University Soilscapes viewer.[23]

Methodology

8.1.35. In order to provide consistency with other similar datasets, namely Historic England (formerly English Heritage) NMP projects noted in Section 8.1.5, above, this aerial analysis and transcription will be undertaken in line with NMP standards.[24], [25] Historic England guidance on the planning and management of projects that involve interpretation and mapping from aerial imagery has also been consulted.[26] The interpretations applied to identified features will be consistent with the preferred terms within the Historic England Monument Type Thesaurus.[27]

Interpretation, orthorectification and transcription

8.1.36. All aerial images from the sources identified above will be systematically examined for any archaeological or historic features visible as cropmarks, soilmarks, earthworks or structures (e.g. WWII pillboxes). In accordance with best practice for remote sensing surveys, all available sources for each field or land parcel will be viewed in conjunction in order to enable the most accurate interpretation possible. During this process reference will be made to the HER and NRHE records, as well as the OS historic maps.

Orthorectification

8.1.37. Where archaeological features are visible on the aerial imagery, these images will be orthorectified (where necessary) using the software Aerial 5.33 prior to their import into ArcMap (GIS) for transcription. The source and accuracy of the height data supplied for this purpose will be confirmed in the final report.

8.1.38. Digital OS Mastermap 1:1250 scale base maps will be used to establish control points, and a DTM likely to consist of 5m point or line data (precise format yet to be confirmed) will be used to apply an elevation to each of them. Six or more control points will be used for each photograph, with the RMS (root mean squared) errors kept below 1m for each control point. This will

[22] British Geological Survey, Geology of Britain Viewer http://mapapps.bgs.ac.uk/geologyofbritain/home.html (accessed on 27 July 2017)
[23] Cranfield University, *Soilscapes* http://www.landis.org.uk/soilscapes/ (accessed on 27 July 2017)
[24] Winton, H., Standards for National Mapping Programme projects, Version 0.1 Draft, Historic England, Aerial Investigation and Mapping, 2018.
[25] Historic England (2017) *Aerial Investigation and Mapping*. Available at: https://historicengland.org.uk/research/methods/airborne-remote-sensing/aerial-investigation/ (accessed on 27 July 2017)
[26] English Heritage, Management of Research Projects in the Historic Environment (MoRPHE) Project Planning Note (PPN) 7: Interpretation and mapping from aerial photographs and other aerial remote sensed data, 2012, Version 1.0. https://historicengland.org.uk/images-books/publications/morphe-project-planning-note-7/ (accessed on 27 July 2017)
[27] Historic England, Forum in Information Standards in Heritage (FISH) Thesauri: EH Monument Type Thesaurus. http://thesaurus.historicengland.org.uk/thesaurus.asp?thes_no=1 (accessed on 27 July 2017)

provide accuracy of within 1m to the OS Mastermap for the orthorectified images.

8.1.39. The OS advise that their 1:2,500 scale Mastermap data has an accuracy of 0.5m RMSE (root mean squared error). Therefore, archaeological features transcribed from images orthorectified using this data will on average be accurate to within 1m-2m of their British national grid (BNG) coordinates.

Transcription

8.1.40. Orthorectified images will then be imported into ArcMap 10.4.1, which will be used to create the detailed digital transcription necessary to fully interpret the archaeological or historic features visible on the aerial imagery. Where possible, all features are to be transcribed as polygons; avoiding the use of lines.

8.1.41. T-hachures will be used to represent scarp edges or other similar earthworks. As there is no facility within GIS to create these, two lines representing the top and bottom edges of the slope will be exported to AutoCAD, where the T-hachures will be drawn using an automated tool. They will then be imported into GIS as shapefiles (.shp) and copied into the transcription geodatabase. The lines representing the top and bottom edges of the slope will then be discarded.

8.1.42. As already noted under Section 8.1.35 above, to ensure consistency with other similar remote sensing datasets, this aerial analysis and transcription will be undertaken in accordance with current NMP standards and guidance. As such the identified features will be transcribed onto the standard NMP drawing layers using standard NMP conventions. The layers and colours indicated can vary between NMP projects, as appropriate (e.g. some may include specific layers for WWII anti-tank cubes or barbed wire, where necessary). Those to be used in this project are set out in Table 8-1, below:

Layer name	Colour	Description
Bank	Red	Defines the outline of positive features such as boundary banks or windmill mounds. Thin banks, or those too diffuse to define accurately, are included on this layer as a single line.
Ditch	Light green	Defines the outline of negative features such as boundary ditches or hollow ways. Thin ditches, or those too diffuse to define accurately, are included on this layer as a single line.
Large cut feature	Blue	Defines the outline of sizeable negative features such as quarries or extractive pits.
Levelled ridge and furrow outline or direction	Magenta	Defines the outline of a single block of ridge and furrow seen either as a cropmark or an earthwork later known to have been levelled. An arrow within each single block indicates the direction of ploughing.
Extant ridge and furrow outline or direction	Cyan	Defines the outline of a single block of ridge and furrow seen as earthworks on the latest available remote sensed imagery. An arrow within each single block indicates the direction of ploughing.

Layer name	Colour	Description
Extent of area / large area feature	Malachite green	Defines the extent of large features such as the perimeters of WWII airfields and military camps. Although the NMP usually uses grey for this layer, teal has been selected here to avoid confusion with the basemap.
T-hachure	Dark blue	Top of the 'T' defines the top of a slope or scarp edge such as a lynchet or house platform. Body of the 'T' indicates the length and direction of the slope.
Structure / building	Purple	Defines the extent of surviving buildings and structures such as individual World War II Nissen Huts and pillboxes. Thin structures such as walls or concrete paths are included in this layer as a single line.

Table 8-1: Layers used in GIS for digital transcription of archaeological features

Table based on Winton, H., (2018), Section 7.5. P31.

8.1.43. Tables 8-2 and 8-3 show period ranges and evidence types that will be used in the GIS attribute tables. The evidence types identify the form in which a feature is visible on the aerial imagery used for the transcription.

Period	Date range
Neolithic	4,000 – 2,200 BC
Bronze Age	2,200 – 700 BC
Iron Age	800 BC – AD 43
Roman	AD 43 – 410
Early medieval	AD 410 - 1066
Medieval	AD 1066 - 1540
Post-medieval	AD 1540 - 1901
20th century	AD 1901 - 2000
World War II	1939 - 1945
Uncertain	

Table 8-2: Period ranges to be used in the GIS attribute data

Evidence
Cropmark (includes soilmarks)
Earthwork
Levelled earthwork
Destroyed monument (i.e. quarried-away)
Structure
Demolished structure

Table 8-3: Evidence types to be used in the GIS attribute data

8.1.44. Information relating to each of the transcribed features will be recorded in the ArcMap attribute data table. This will include details such as the interpretation of each feature, with a brief description, as well as the existing HER and NRHE record numbers (if applicable). The references of aerial images used in each transcription from the Historic England Archive, HER, or Heathrow aerial imagery catalogue number will be cited in the Source column, to facilitate retrieval and review of this data source at a future date if necessary. Each feature will also be assigned a unique identifier, which will be used to group multiple polygons used to map a single settlement site, for example. An example of an attribute data table is shown in Table 8-4, below.

Unique identifier	NRHE	HER	Period	Type	Evidence	Description	Source

Table 8-4: Example attribute data table for each feature transcribed

Table 1 based on Winton, H., (2018), Section 7.5. P31.

8.1.45. It is possible that upon wider dissemination of the project results to local HERs and the Historic England Archive etc (see Section 8.1.48, below); an additional attribute data column containing a copyright statement (if applicable) and the project name may be included. This will assist in identifying the source of this survey data.

Quality Assurance (QA)

8.1.46. Historic England will be undertaking a quality assurance exercise as part of this project. It has been agreed that this will comprise a half day meeting at the Historic England Archive Public Search Room (PSR). This will focus on the results of a 5% sample of the aerial analysis and transcription study area, to be chosen by the IDT personnel undertaking this task. It will not be required to supply the source imagery or transcriptions in advance of this meeting.

Deliverables / output

Transcription

8.1.47. The primary output of the archaeological aerial analysis and transcription will be the detailed digital transcription of each identified potential archaeological feature. Information relating to the interpretation of these features is contained within the attribute data of every line and polygon drawn within ArcMap (see Section 8.1.42, above).

Report

8.1.48. The transcription will be accompanied by a brief report summarising the overall results, and highlighting any features of interest. It will also include a discussion of factors which may have affected the identification and interpretation of features.

8.1.49. This will contain a gazetteer of the results, which will be derived from the GIS attribute data of each line and polygon transcribed. This will be accompanied by a series of figures showing the overall transcriptions across the study area.

8.1.50. This is not intended to be a detailed and lengthy report as this dataset is to be integrated into the wider historic environment baseline assessment, which is where the discussion of local/regional/national significance of the features identified will take place.

Dissemination of results

8.1.51. As well as being distributed within the Heathrow Expansion Project historic environment team and wider IDT (Integrated Design Team); it is intended that the aerial analysis and transcription dataset should be disseminated to the relevant local HERs, for inclusion in their database. It will also be disseminated to the Historic England Archive, for inclusion with the NMP dataset. The copyright of this dataset will be defined prior to issue.

8.1.52. It is not intended to create a project database from the results of this aerial analysis and transcription project, nor will it be possible to create and input monument records directly into the HER and/or NRHE (as would sometimes be the case for an NMP project).

References

Creator	Title	Publisher	Date
British Geological Survey	*Geology of Britain Viewer.*[22]	British Geological Survey	2017
Cranfield University	*Soilscapes*.[23]	Cranfield University	2017
Edis, J.	*The Classification of Cropmarks in Kent: A Report for the Monuments Protection Programme*.[20]	Air Photography Unit, Royal Commission on the Historical Monuments of England (RCHME)	1989
English Heritage	*Management of Research Projects in the Historic Environment (MoRPHE) Project Planning Note (PPN) 7: Interpretation and mapping from aerial photographs and other aerial remote sensed data*. Version 1.0. [26]	English Heritage	2012
Fenner, V., Dyer, C.	*Thames Valley Project: A Report for the National Mapping Programme*. [18]	Air Photography Unit, Royal Commission on the Historical Monuments of England (RCHME)	1994
Fenner, V.	*Crop Marks in Hertfordshire: A Report for the National Mapping Programme*.[19]	Air Photography Unit, Royal Commission on the Historical Monuments of England (RCHME).	1992
Historic England	*Aerial Investigation and Mapping*. [25]	Historic England	2017
Historic England	*Forum in Information Standards in Heritage (FISH) Thesauri: EH Monument Type Thesaurus*. [12]	Historic England	2017
Winton, H	*Standards for National Mapping Programme projects, Version 0.1* Draft. [24]	Historic England, Aerial Investigation and Mapping.	2018

Appendix 11.2
Designated heritage assets within the study area (scheduled monuments, listed buildings and conservation areas)

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1.1 Designated heritage assets - scheduled monuments

1.1.1 Scheduled monuments (SM's) are nationally important archaeological sites included within the National Heritage List for England (NHLE). The NHLE is the official register of all nationally protected (designated) historic buildings and sites in England.

1.1.2 There are seven SM's within the historic environment study area.

Table 11.2.1 Scheduled Monuments within the historic environment study area

List number	Title	List description summary
1002042	Romano-British site 1000yds (910m) W of East Bedfont parish church	The monument consists of a complex of soilmarks and cropmarks showing circles, enclosures and small fields, possibly a Romano-British settlement. Together with SM 1002043, the monument forms part of a group of cropmarks on the southern edge of Heathrow Airport identified by air photography. The site includes a series of rectilinear enclosures and ring ditches, with a less distinct area of possible pits and curvilinear features to the south representing part of a later prehistoric/Romano-British settlement and its associated field systems. The area immediately to the north west was destroyed by Esso Petroleum Company's West London Terminal Depot and excavation in 1971-2 revealed in that area a single Bronze Age ring ditch, several Iron Age hut circles and a multi-phase ditch system. (Legacy Entry – Old County Number).
1002043	Part of a causewayed enclosure, 632m north-east of Mayfield Farm	The monument includes the western part of a causewayed enclosure surviving as archaeological remains which are visible as soilmarks and cropmarks on aerial photographs. It is situated on gently sloping ground bordering the A30, just south of Stanwell Road near Heathrow Airport. The enclosure has been truncated by the A30 and a housing estate but about three quarters of it survives to the west and is the subject of this scheduling. It is double-ditched and curvilinear in shape with a flattened south-west side. The outer ditch would have originally enclosed an area of approximately 245m by 220m (about 4 hectares). The inner ditch would have enclosed an area of approximately 170m by 155m (about 1.9 hectares). The two ditches vary between 22m and 43m apart. Several possible causeways are visible, with a well-defined entrance to the WNW and other breaks in both circuits. In 1987, a geophysical survey was carried out on the site and subsequent fieldwalking recovered a scatter of flints of predominantly Late Neolithic or Early Bronze Age type. In 1988, partial excavation recovered Late Bronze Age pottery from the secondary ditch silts. In 1996, the Royal Commission on the Historical Monuments of England (RCHME) carried out a

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List number	Title	List description summary
		photogrammetric survey of the area. The monument is similar in form to a Neolithic causewayed enclosure identified between Wraysbury and Staines. A narrow linear ditch abuts the outside of the enclosure on the north-west side and other faint rectilinear features have been identified, which are possible field boundaries. Together with surface finds of Romano-British pottery, these are likely to relate to later use and occupation of the area.
1003807	Bronze Age settlement, W of Runnymede Bridge	The monument includes a Late Bronze Age settlement surviving as buried archaeological remains. It is situated on a floodplain on the south bank of the River Thames, opposite the confluence of the Thames and the Colne Brook. The site is located to the west of Runnymede Bridge on an area of flat ground, within a sequence of river channel sediments and layers of alluvial deposition. Excavation has shown that the site includes a large number of post holes and a wattle and daub spread including a double row of in-situ pile driven timber uprights forming a river frontage. The finds recovered include part of a spearhead and socketed axe fragment, pins, 'buttons', rings, possible pommel, two pairs of tweezers, amber beads, spindle whorls, a loom weight and worked bone objects. This bronze assemblage was dated to the 9th-8th century BC. The area to the east was partially excavated in advance of the construction of a new bridge for the M25 between 1972 and 1980. Later research excavations were carried out to the west, between Runnymede Hotel and the M25, by the British Museum between 1984 and 1989. It indicates that indigenous metalworking was carried out on the site and that the settlement also formed an important point of trade. The present site represents a continuation of Bronze Age settlement remains uncovered immediately to the east, prior to the construction of the M25. Climatic deterioration was probably responsible for the later abandonment of the riverside site. The excavations also yielded earlier evidence of Mesolithic and Neolithic occupation.
1003807	Bronze Age settlement, W of Runnymede Bridge	The monument includes a Late Bronze Age settlement surviving as buried archaeological remains. It is situated on a floodplain on the south bank of the River Thames, opposite the confluence of the Thames and the Colne Brook. The site is located to the west of Runnymede Bridge on an area of flat ground, within a sequence of river channel sediments and layers of alluvial deposition. Excavation has shown that the site includes a large number of post holes and a wattle and daub spread including a double row of

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List number	Title	List description summary
		in-situ pile driven timber uprights forming a river frontage. The finds recovered include part of a spearhead and socketed axe fragment, pins, 'buttons', rings, possible pommel, two pairs of tweezers, amber beads, spindle whorls, a loom weight and worked bone objects. This bronze assemblage was dated to the 9th-8th century BC. The area to the east was partially excavated in advance of the construction of a new bridge for the M25 between 1972 and 1980. Later research excavations were carried out to the west, between Runnymede Hotel and the M25, by the British Museum between 1984 and 1989. It indicates that indigenous metalworking was carried out on the site and that the settlement also formed an important point of trade. The present site represents a continuation of Bronze Age settlement remains uncovered immediately to the east, prior to the construction of the M25. Climatic deterioration was probably responsible for the later abandonment of the riverside site. The excavations also yielded earlier evidence of Mesolithic and Neolithic occupation.
1005920	Schoolhouse (Lord Knyvett's)	The monument includes a former school building founded in 1624 from the will of Lord Thomas Knyvet. It is two storeys high and constructed of brick with a pitched tiled roof. The building originally formed a single composition of two three-bay halves. The west front has two doorways with heavy flat plastered surrounds and pediments. It was formerly a pattern school with separate boys and girls entrances. The left hand side was later altered into one high room and used as the main school building with the right hand side becoming the master's house. Flanking the left entrance are two tall 20th century two-light double transomed windows. A single storey extension was added to the north side in the 20th century. At the centre of the west front is a tablet with a coat of arms commemorating Lord Knyvet. Lord Knyvet was granted the Manor of Stanwell by King James I in 1603. He served a long and distinguished career at court and helped foil the gunpowder plot whilst working as Keeper of Whitehall Palace in 1605. He later acted as Privy Councillor to Queen Anne. Following his death in July 1622 he provided for the foundation of the free school at Stanwell in his will. The former school building is listed Grade II*.
1006944	Two concentric ditches showing as crop marks at Thorney	Two concentric ditches showing as crop marks at Thorney (Legacy Entry - Old County Number).
1006995	Early medieval and medieval palace and	Early medieval and medieval palace and associated monuments, Kingsbury (Legacy Entry - Old County Number).

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List number	Title	List description summary
	associated monuments, Kingsbury	
1007943	Ankerwyke Priory: a Benedictine nunnery with associated moat and fishponds	The monument includes the site of Ankerwyke Priory, a Benedictine nunnery situated on the north bank of the River Thames. Today the remains consist of a portion of a ruined 13th century building, Listed Grade II, moat, fishponds and an extensive area of earthworks. The standing remains represent the north-eastern corner of a once substantial two storied building, orientated east to west with portions of walling surviving 8m to 10m long and up to 3m high. Three window openings can be recognised in the walling, their styles suggesting 13th, 15th and 17th century phases of construction. The fabric of the building is of random chalk boulder and rubble with chalk and sandstone dressings and later brick infilling. The earthwork remains are extensive and well preserved. In the pasture field to the immediate south of the standing walling and above the river floodplain is a substantial rectangular platform 50m square. Its interior is slightly hollowed and shows evidence for former occupation in the form of vegetation changes and surface irregularities. The platform is defined around the west and south sides by a ditch or moat, up to 12m wide and varying between 0.4m and 1.1m deep. The southern arm of this feature turns at its eastern end to run southwards for 100m, then turns north east to join with a natural water course. This feature probably functioned as part of a water management system, designed to protect the grounds of the nunnery from flooding. In the south-eastern corner of the enclosed area are two rectangular fishponds, both 50m long by 16m wide and set at right angles to one another. Beyond the enclosed grounds of the nunnery are various less clearly defined earthworks believed to be associated with the nunnery. These include, to the north, a series of ill-defined surface undulations and, in the south, a possible third fishpond and causeway. All modern buildings and boundary features are excluded from the scheduling although the ground beneath them is included.

1.2 Designated heritage assets - listed buildings

1.2.1 Listed buildings (LB's) are historic buildings of special interest that are contained within the NHLE. LB's can be listed at Grade I, II* or II.

1.2.2 There are 228 listed buildings within the historic environment study area:

1. Four Grade I listed buildings classed as being of exceptional interest;

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2. 16 Grade II* listed buildings classed as being of more than special interest; and
3. 208 Grade II listed buildings classed as being of special interest.

Table 11.2.2 Listed buildings within the historic environment study area

List Number	Title	Grade	Location
1028925	Boat House North End Of Runnymede Meadows Between Windsor Road And River Thames	II	Runnymede, Surrey, SL4
1067584	Milestone 13 Miles From London	II	Hounslow, London, TW14
1067589	Bedfont House	II	Hounslow, London, TW14
1074922	Holmwood	II	Hounslow, London, TW14
1074923	The Farm [redacted]	II	Hounslow, London, TW14
1080118	K6 Telephone Kiosk In Front Of Five Bells Public House	II	Hillingdon, London, UB7
1080119	Pair Of K6 Telephone Kiosks In Front Of Number 85, North Of Church Road, The Green	II	Hillingdon, London, UB7
1080123	Harmondsworth Hall	II	Hillingdon, London, UB7
1080124	Wall And Gates To South Of Harmondsworth Hall	II	Hillingdon, London, UB7
1080125	Wall To West And North Of The Grange	II	Hillingdon, London, UB7
1080129	1, Swan Road	II	Hillingdon, London, UB7
1080138	Elder Farmhouse	II	Hillingdon, London, UB3
1080149	Bridge Over River Crane	II	Hillingdon, London, UB3
1080157	Cranford House Stables	II	Hillingdon, London, UB3
1080158	Walls To North Of Stables	II	Hillingdon, London, UB3
1080163	Church Of St Peter And St Paul	I	Hillingdon, London, UB3
1080164	The King William Iv Public House	II	Hillingdon, London, UB7
1080195	Harlington Baptist Church	II	Hillingdon, London, UB3
1080196	The Dower House	II	Hillingdon, London, UB3
1080197	Forecourt Wall To The Dower House	II	Hillingdon, London, UB3

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Heathrow Expansion
Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

List Number	Title	Grade	Location
1080198	The White Hart Public House	II	Hillingdon, London, UB3
1080199	Acacia House	II	Hillingdon, London, UB7
1080200	Howcroft (Rear Part Only)	II	Hillingdon, London, UB7
1080201	Church Of St Mary, Harmondsworth	II*	Hillingdon, London, UB7
1080202	The Crown Public House	II	Hillingdon, London, UB7
1080217	The Lodge	II	Hillingdon, London, UB7
1080218	Wall To East Of The Lodge	II	Hillingdon, London, UB7
1080219	Lanz Farmhouse	II	Hillingdon, London, UB7
1080247	15, The Green	II	Hillingdon, London, UB7
1080248	Number 25, Including Wall And Stable Building Behind	II	Hillingdon, London, UB7
1080249	Elmsdale House	II	Hillingdon, London, UB7
1080250	The Old House	II	Hillingdon, London, UB7
1080251	Wall To East Of Barn To South Of Avenue Cottage	II	Hillingdon, London, UB7
1080252	Forecourt Walls To West Of Southlands	II	Hillingdon, London, UB7
1080253	Front Wall And Gates To Number 24	II	Hillingdon, London, UB7
1080275	Wall And Gate Piers To North Of The Old Gatehouse	II	Hillingdon, London, UB7
1080276	Walls To North And West Of Land Of Gatehouse Nurseries	II	Hillingdon, London, UB7
1080277	Wall In Front Of Numbers 30 To 36 (Even)	II	Hillingdon, London, UB7
1080296	King Henry Public House The Stables	II	Hillingdon, London, UB7
1080297	Longford Close	II	Hillingdon, London, UB7
1080298	Flats 1-3 (Yeomans)	II	Hillingdon, London, UB7
1080299	King's Bridge	II	Hillingdon, London, UB7
1080305	Stansfield House	II	Hounslow, London, TW5
1080306	The Village Lock-Up (Also Known As The Round House)	II	Hounslow, London, TW5

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Heathrow Expansion
Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

List Number	Title	Grade	Location
1080324	Burlington House And Flanking Walls Of Burlington House	II	Hounslow, London, TW14
1080325	Green Man Public House	II	Hounslow, London, TW14
1088096	Baber Bridge	II	Hounslow, London, TW14
1096071	Brentford Fountain Western International Market	II	Hounslow, London, UB2
1096132	Gates Monument At St Marys Church	II	Hounslow, London, TW14
1096133	Brick Chest Tomb South Of Gates Monument At St Marys Church	II	Hounslow, London, TW14
1096134	Captain Millers Headstone At St Marys Church	II	Hounslow, London, TW14
1096135	Group Of Three 18th Century Headstones St Marys Church	II	Hounslow, London, TW14
1096136	18th Century Headstone St Marys Church	II	Hounslow, London, TW14
1096137	Headstone To Mary Taylor St Marys Church	II	Hounslow, London, TW14
1117604	Greenwood	II	Wraysbury, Windsor and Maidenhead, TW19
1117605	The Old Vicarage	II	Wraysbury, Windsor and Maidenhead, TW19
1117606	Church Of St Andrew	II*	Wraysbury, Windsor and Maidenhead, TW19
1117642	Little Court	II	Horton, Windsor and Maidenhead, SL3
1117643	The Old Rectory	II	Horton, Windsor and Maidenhead, SL3
1117644	Church Of St Michael	I	Horton, Windsor and Maidenhead, SL3
1117645	The Five Bells Public House	II	Horton, Windsor and Maidenhead, SL3
1117646	Magna Carta House	II	Wraysbury, Windsor and Maidenhead, TW19
1117647	Tithe Farm Cottage	II	Wraysbury, Windsor and Maidenhead, TW19
1119717	Monument At North Western End Of General Roys Survey Base	II	Hillingdon, London, TW6
1124367	The Ostrich Public House	II*	Colnbrook with Poyle, Slough, SL3
1124368	Town House	II	Colnbrook with Poyle, Slough, SL3

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Heathrow Expansion

Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

List Number	Title	Grade	Location
1124369	Excelsior House	II	Colnbrook with Poyle, Slough, SL3
1124376	Barn At Tanhouse Farm To South East Of The Farmhouse	II	Colnbrook with Poyle, Slough, SL3
1124379	Sutton Court Farmhouse	II	Iver, South Bucks, Buckinghamshire, SL3
1124382	Stable Range At Thorney Farm	II	Iver, South Bucks, Buckinghamshire, SL0
1124383	St Thomas's Vicarage	II	Colnbrook with Poyle, Slough, SL3
1124403	Barn To Rear Of Aberdeen House	II	Colnbrook with Poyle, Slough, SL3
1124405	Ayres House (Bt And G Winston Premises)	II	Colnbrook with Poyle, Slough, SL3
1124406	Lucas (Newsagent)	II	Colnbrook with Poyle, Slough, SL3
1124407	Milestone Outside No 3 Milestone Cottages	II	Colnbrook with Poyle, Slough, SL3
1124408	Number 110 And House Adjoining To West (Anthonys (79) Ltd)	II	Colnbrook with Poyle, Slough, SL3
1135929	Horton Cedars	II	Horton, Windsor and Maidenhead, SL3
1135966	Lych Gate To North Of Church Of St Michael	II	Horton, Windsor and Maidenhead, SL3
1135976	King Johns Hunting Lodge	II*	Wraysbury, Windsor and Maidenhead, TW19
1164451	The Red Lion Public House	II	Colnbrook with Poyle, Slough, SL3
1164470	Park House And Ye Olde George Public House	II	Colnbrook with Poyle, Slough, SL3
1164740	Thorney House	II	Iver, South Bucks, Buckinghamshire, SL0
1164843	The Tower Arms Public House	II	Iver, South Bucks, Buckinghamshire, SL0
1164886	Former School (Now Colnbrook Youth Centre)	II	Colnbrook with Poyle, Slough, SL3
1180958	St George's Meadows	II	Hillingdon, London, UB7
1181190	Church Of St Dunstan	II*	Hillingdon, London, UB3
1181206	Curved Wall To South Of West End Of Stables	II	Hillingdon, London, TW5
1181370	Walls To North Of Church Of Saint Peter And Saint Paul	II	Hillingdon, London, UB3
1181607	Fray's Cottage Old Mill House	II*	Hillingdon, London, UB7

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Heathrow Expansion
Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

List Number	Title	Grade	Location
1187016	Milestone At Madbridge	II	Hillingdon, London, SL3
1187017	Callis Farmhouse	II	Spelthorne, Surrey, TW19
1187039	13, High Street	II	Spelthorne, Surrey, TW19
1187040	Brook Cottage, Boundary Walls And Iron Railings	II	Spelthorne, Surrey, TW19
1187041	Coachman's Cottage	II	Spelthorne, Surrey, TW19
1187042	Church Of St Mary	I	Spelthorne, Surrey, TW19
1187043	Frances Paterson Tomb In St Mary's Churchyard	II	Spelthorne, Surrey, TW19
1187044	Charles Rowlls Tomb In St Mary's Churchyard	II	Spelthorne, Surrey, TW19
1187045	Forecourt Wall And Gate Piers Of Dunmore House	II	Spelthorne, Surrey, TW19
1187046	The Vicarage	II	Spelthorne, Surrey, TW19
1187047	Old Farm Guest House	II	Spelthorne, Surrey, TW19
1187048	Granary About 15 Yards East Of No 56	II	Spelthorne, Surrey, TW19
1187049	Hithermoor Farmhouse	II	Spelthorne, Surrey, TW19
1187050	Barn And Stables 30 Yards West Of Hithermoor Farmhouse	II	Spelthorne, Surrey, TW19
1187054	Moor Cottage	II	Spelthorne, Surrey, TW19
1187057	Perry Green	II	Spelthorne, Surrey, TW19
1187058	Gates Piers And Gates To Stanwell Place	II	Spelthorne, Surrey, TW19
1187059	Badminton House, Post Office, Adjoining House And Hampton House	II	Colnbrook with Poyle, Slough, SL3
1187060	Kenilworth And Adjoining House	II	Colnbrook with Poyle, Slough, SL3
1187061	Star And Garter Public House	II	Colnbrook with Poyle, Slough, SL3
1187062	Barn To King John's Palace	II	Colnbrook with Poyle, Slough, SL3
1187063	The Hollies	II	Colnbrook with Poyle, Slough, SL3
1188725	Fawns Manor	II	Hounslow, London, TW14
1192507	The White Horse Public House	II	Hillingdon, London, UB7
1192588	Weekly House	II	Hillingdon, London, UB7
1193001	The Old Gatehouse	II*	Hillingdon, London, UB7

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Heathrow Expansion
Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

List Number	Title	Grade	Location
1193014	Walls To East And South Of Garden Of Number 28 (Coombe House)	II*	Hillingdon, London, UB7
1193679	Barn To South Of Avenue Cottage	II	Hillingdon, London, UB7
1193735	The Olde Cottage	II	Hillingdon, London, UB7
1194282	268-272, High Street	II	Hillingdon, London, UB3
1194310	The Vicarage Tower House	II	Hillingdon, London, UB7
1194332	The Great Barn, Harmondsworth	I	Hillingdon, London, UB7
1194343	The Five Bells Inn	II	Hillingdon, London, UB7
1204803	Milestone	II	Spelthorne, Surrey, TW19
1204809	The Swan Public House	II	Spelthorne, Surrey, TW19
1204814	Boundary Wall Between No 40b And Entrance To Coachman's Cottage	II	Spelthorne, Surrey, TW19
1204863	John Hodges Vault In St Mary's Churchyard	II	Spelthorne, Surrey, TW19
1204875	Dunmore House	II*	Spelthorne, Surrey, TW19
1204882	46 And 48, High Street	II	Spelthorne, Surrey, TW19
1204896	Lord Knyvett's Adult Education Centre	II*	Spelthorne, Surrey, TW19
1204903	Barn 15 Yards West Of Hithermoor Farmhouse	II	Spelthorne, Surrey, TW19
1204906	Old Oak Cottage	II	Spelthorne, Surrey, TW19
1204925	Yeovaney Manor Lodge (North Wing,South Wing, Coach House And Pineapple Capped Gate Pier) Yeoveney Manor Lodge	II	Spelthorne, Surrey, TW19
1204965	1, 2 And 3, Park Street	II	Colnbrook with Poyle, Slough, SL3
1204982	Fairmead And The Haven	II	Colnbrook with Poyle, Slough, SL3
1204986	The White Hart Inn	II	Colnbrook with Poyle, Slough, SL3
1205057	Windsor House	II	Colnbrook with Poyle, Slough, SL3
1205094	Former Staines West Station Moor House	II	Spelthorne, Surrey, TW18
1240382	Engine House, Thames Water Station	II	Spelthorne, Surrey, TW18

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Heathrow Expansion
Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

List Number	Title	Grade	Location
1240403	Building Adjoining Engine House To North East Thames Water Station	II	Spelthorne, Surrey, TW19
1240644	Marjory Kinnon School The Old School	II	Hounslow, London, TW14
1240696	The Rectory	II	Hounslow, London, TW5
1244863	Royal Standard House	II	Colnbrook with Poyle, Slough, SL3
1250772	Monument To William And Elizabeth Brookes In Churchyard Of Church Of St Peter And St Paul	II	Hillingdon, London, UB3
1268530	Technical Block A, Heathrow Airport	II	Hillingdon, London, TW6
1280897	City Post	II	Colnbrook with Poyle, Slough, SL3
1280920	King Johns Palace	II*	Colnbrook with Poyle, Slough, SL3
1281005	Henry Bullock Tomb In St Mary's Churchyard	II	Spelthorne, Surrey, TW19
1284844	The Pheasant Public House	II	Hillingdon, London, UB3
1284985	Sipson House	II	Hillingdon, London, UB7
1285085	Ha Ha Walls To South And South West Of Cranford House Stables	II	Hillingdon, London, UB3
1285115	Cellars Of Former Cranford House	II	Hillingdon, London, UB3
1285225	Colne Mead	II	Hillingdon, London, UB7
1286038	Southlands	II*	Hillingdon, London, UB7
1286043	24, The Green	II	Hillingdon, London, UB7
1286057	Wall To North Of Number 31	II	Hillingdon, London, UB7
1286058	33 And 33a, The Green	II	Hillingdon, London, UB7
1286076	27, The Green And Industrial Buildings Adjoining Behind Number 27	II	Hillingdon, London, UB7
1286104	1-11, The Green	II	Hillingdon, London, UB7
1286348	Walls In Front Of Numbers 52-58 (Even) And Along West End Of Property	II	Hillingdon, London, UB7
1286366	Walls Around St Martin's Churchyard	II*	Hillingdon, London, UB7
1286544	Barn To West Of Weekly House	II	Hillingdon, London, UB7
1286577	Longford Cottage	II	Hillingdon, London, UB7

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Heathrow Expansion

Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

List Number	Title	Grade	Location
1298894	Windsor Cottage	II	Spelthorne, Surrey, TW19
1298895	40b, High Street	II	Spelthorne, Surrey, TW19
1298896	Anonymous Vault In St Mary's Churchyard	II	Spelthorne, Surrey, TW19
1298897	The Croft	II	Spelthorne, Surrey, TW19
1298900	Duncroft House	II	Spelthorne, Surrey, TW18
1298901	Cheyne Cottage	II	Spelthorne, Surrey, TW19
1298902	The Wheatsheaf Inn And Wheatsheaf Cottages	II	Spelthorne, Surrey, TW19
1298903	Abington	II	Colnbrook with Poyle, Slough, SL3
1298904	Colne Cottage	II	Colnbrook with Poyle, Slough, SL3
1298905	Poyle Farmhouse	II	Colnbrook with Poyle, Slough, SL3
1298921	Water-Pump Approximately 75 Yards East Of The Punchbowl Inn	II	Colnbrook with Poyle, Slough, SL3
1298922	Stanwell Farmhouse	II	Spelthorne, Surrey, TW19
1312996	Dairy At Berkin Manor At North East Corner Of House	II	Horton, Windsor and Maidenhead, SL3
1313011	Horton Lodge	II	Horton, Windsor and Maidenhead, SL3
1313015	Ashgood Farmhouse	II	Horton, Windsor and Maidenhead, SL3
1313022	The Perserverance Public House	II	Wraysbury, Windsor and Maidenhead, TW19
1313030	Downhams	II	Wraysbury, Windsor and Maidenhead, TW19
1313048	The Crown Public House And Attached Barn	II	Horton, Windsor and Maidenhead, SL3
1317589	Church Of St Thomas	II	Colnbrook with Poyle, Slough, SL3
1317656	Mill House And Tanhouse Farmhouse J R Swanston Plant And Engineer (Longford) Limited	II	Colnbrook with Poyle, Slough, SL3
1317757	34, High Street	II	Colnbrook with Poyle, Slough, SL3
1317805	Aberdeen House	II	Colnbrook with Poyle, Slough, SL3
1319361	Brookfield	II	Horton, Windsor and Maidenhead, SL3
1319362	Mildridge Farmhouse	II	Horton, Windsor and Maidenhead, SL3

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Heathrow Expansion
Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

List Number	Title	Grade	Location
1319363	Churchyard Wall To West Of Church Of St Michael	II	Horton, Windsor and Maidenhead, SL3
1319364	Ankerwyke Priory Ruins	II	Wraysbury, Windsor and Maidenhead, TW19
1319382	The George Inn	II	Wraysbury, Windsor and Maidenhead, TW19
1319383	Manor Farmhouse (Immediately North Of Church)	II	Wraysbury, Windsor and Maidenhead, TW19
1332739	Old Timbers	II	Iver, South Bucks, Buckinghamshire, SL3
1332745	Old School House	II	Colnbrook with Poyle, Slough, SL3
1358318	Pates Manor	II	Hounslow, London, TW14
1358320	Cranford Park Bridge	II	Hounslow, London, UB3
1358325	Church Of St Martin	II*	Hillingdon, London, UB7
1358326	Wall Running South From The Old Gatehouse And West Along Front Of Gatehouse Nurseries	II*	Hillingdon, London, UB7
1358327	Wall In Front Of Numbers 40 To 50 (Even)	II	Hillingdon, London, UB7
1358336	Queen River Cottage Willow Tree Cottage	II	Hillingdon, London, UB7
1358337	Orchard Cottage	II	Hillingdon, London, UB7
1358338	Wall To North West Of Weekly House	II	Hillingdon, London, UB7
1358345	Drayton Hall (Council Offices)	II	Hillingdon, London, UB7
1358346	Offices Of The Valentine Varnish And Lacquer Company	II	Hillingdon, London, UB7
1358349	The Frays	II*	Hillingdon, London, UB7
1358351	29, The Green	II	Hillingdon, London, UB7
1358352	Forecourt Walls To Number 31	II	Hillingdon, London, UB7
1358353	Avenue Cottage Avenue House (Flats 1-4)	II	Hillingdon, London, UB7
1358354	Walls To North And East Of Garden Of Southlands	II	Hillingdon, London, UB7
1358355	Hope Cottage	II	Hillingdon, London, UB7

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Heathrow Expansion
Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

List Number	Title	Grade	Location
1358366	The Sun House	II	Hillingdon, London, UB7
1358367	Manor Farmhouse	II	Hillingdon, London, UB7
1358368	The Gable Stores	II	Hillingdon, London, UB7
1358387	Wall To South Of East End Of Stables	II	Hillingdon, London, TW5
1358388	Garden Walls To West Of Cranford House Stables	II	Hillingdon, London, UB3
1358391	Wall To South Of Churchyard Of Church Of St Peter And St Paul	II	Hillingdon, London, UB3
1358403	Forecourt Wall To Number 85	II	Hillingdon, London, UB7
1358410	25, Holloway Lane	II	Hillingdon, London, UB7
1358411	The Railway Arms Public House	II	Hillingdon, London, UB7
1358413	The Grange	II	Hillingdon, London, UB7
1358414	Wall To East Of The Grange	II	Hillingdon, London, UB7
1360959	Church Of St Mary	II	Hounslow, London, TW14
1360961	Milestone 12 Miles From London	II	Hounslow, London, TW14
1376787	Gate Piers And Walls	II	Hounslow, London, TW14
1390714	Milestone	II	Spelthorne, Surrey, TW19
1393523	Stanwell War Memorial	II	Spelthorne, Surrey, TW19
1393676	War Memorial Cherry Lane Cemetery	II	Hillingdon, London, UB3
1409790	Road Traffic Hazard Sign	II	Hillingdon, London, UB3
1428695	Roman Catholic Church Of St Catherine	II	Hillingdon, London, UB7
1444965	Harlington War Memorial	II	Hillingdon, London, UB3

1.3 Designated heritage assets - Conservation Areas

1.3.1 Conservation Areas are areas identified and designated by local planning authorities as having special architectural and historic interest.

1.3.2 There are 11 Conservation Areas which lie partly or wholly within the historic environment study area.

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Heathrow Expansion
Designated heritage assets within the study area
(scheduled monuments, listed buildings and conservation areas)

Table 11.2.3 Conservation Areas within the historic environment study area

Conservation Area	Local Planning Authority
Botwell Thorne EMI Conservation Area	London Borough of Hillingdon
Cranford Park Conservation Area (Hillingdon)	London Borough of Hillingdon
Harlington Village Conservation Area	London Borough of Hillingdon
Harmondsworth Village Conservation Area	London Borough of Hillingdon
Longford Village Conservation Area	London Borough of Hillingdon
West Drayton Green Conservation Area	London Borough of Hillingdon
Bedfont Green Conservation Area	London Borough of Hounslow
Cranford Park Conservation Area (Hounslow)	London Borough of Hounslow
Old Windsor Conservation Area	Royal Borough of Windsor and Maidenhead
Colnbrook Conservation Area	Slough Borough Council
Staines Conservation Area	Spelthorne Borough Council
Stanwell Conservation Area	Spelthorne Borough Council

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Appendix 12.1
Local Planning Authority health priorities

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1. INTRODUCTION

1.1.1 As part of the scoping for the health chapter of the Environmental Statement (ES), a review of the health priorities of each Local Planning Authority area in the wider study area has been undertaken. This appendix presents the findings of that review. The objectives of the review were:

1. To capture the main health issues and priorities for each area
2. To identify any information relevant to the Airport, locations/communities close to the Airport and vulnerable groups.

1.1.2 The review used a number of different documents for each Local Planning Authority area to identify issues and priorities. It reviewed Joint Strategic Needs Assessments (JSNAs) which are assessments of the current and future health and social care needs of the local community. There is no standard template or mandatory data set for a JSNA and local areas are free to undertake them in a way best suited to their local circumstances. This means they take very different forms. Most are very extensive and many are now web-based interfaces that are continuously updated, rather than single documents. They highlight needs, rather than identify priorities, and are more of a data resource for public health than an action plan.

1.1.3 It also reviewed Joint Health and Wellbeing Strategies (JHWSs) which are strategies for meeting the needs identified in JSNAs. They explain what the priorities for action are and are used to inform local commissioning and locally led initiatives. Again, there is no standard template for JHWSs so they take different forms.

1.1.4 Local health and wellbeing boards have responsibility for developing JSNAs and JHWSs. These boards are made up of Local Planning Authorities and Clinical Commissioning Groups. Health and wellbeing boards often include additional members such as local voluntary and community sector organisations, patient representatives, health and care professionals, experts and other local players. Therefore, JSNAs and JHWSs should reflect the perspectives of a range of stakeholders.

1.1.5 Health and wellbeing boards can choose to work together to produce JSNAs and/or JHWSs, covering their combined geographical area. Therefore, sometimes the JSNA may cover a larger area than the JHWS, as for example is the case for Spelthorne and Runnymede which are both included in the JSNA for the county of Surrey.

1.1.6 In addition to JSNAs and JHWSs, the review of health priorities looked relevant data in the Public Health Profile for each area. These Public Health Profiles are

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produced by Public Health England (PHE) to provide a snapshot overview of a range of health-related data for each Local Planning Authority in England. This review looked at data including life expectancy, health inequalities as measured by differences in life expectancy, health assets and the wider determinants of health. It used this data to identify potential relevant health issues for each Local Planning Authority area, for example where measures for a determinant health are worse than the average for England.

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2. REVIEW

Overview

2.1.1 This section summarises health priorities and issues for each of the ten Local Planning Authority areas in the wider study area using information taken from its JSNA and the JHWS. These Local Planning Authorities are:

1. South Bucks District Council
2. London Borough of Ealing
3. London Borough of Hounslow
4. Spelthorne Borough Council
5. Slough Borough Council
6. The Royal Borough of Windsor and Maidenhead
7. Runnymede Borough Council
8. London Borough of Hillingdon
9. London Borough of Richmond upon Thames
10. London Borough of Wandsworth.

2.1.2 The section supplements the JSNA/JHWS information with summary information from Public Health Profile produced by PHE on the health of the population, health assets and wider determinants of health.

South Bucks District Council

The JSNA and JHWS

2.1.3 The JSNA covers the County of Buckinghamshire and has been updated for 2016 to 2020. The JSNA does not itself set priorities. It is structured in sections that consist of population characteristics, social determinants of health and population groups. Each of these sections is further broken down into sub-sections on specific determinants, population sub-groups or disease area. These sub-sections in some cases include conclusions and in others, recommendations.

2.1.4 The JHWS covers 2016-2021 (2017 revision). It has five key priorities:

1. Give every child the best start in life
2. Keep people healthier for longer and reduce the impact of long term conditions
3. Promote good mental health and wellbeing for everyone

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4. Protect residents from harm
5. Support communities to enable people to achieve their potential and ensure Buckinghamshire is a great place to live.

Data on deprivation, health assets, wider determinants of health

2.1.5 The health of people in South Bucks is generally better than the England average. South Bucks is one of the 20% least deprived districts/unitary authorities in England. However about 10% (1,100) of children live in low income families. Life expectancy is 5.8 years lower for men and 7.2 years lower for women in the most deprived areas of South Bucks than in the least deprived areas. PHE data on health assets and the determinants of health for Bucks are generally better than the national average. The number killed and seriously injured on the roads is higher than the national average.

London Borough of Ealing

The JSNA and JHWS

2.1.6 The JSNA covers the area of the borough. In 2017 three chapters were updated. Other chapters date from 2016 or 2014. JSNA chapters are based on the six policy objectives of the "Fair Society, Healthy Lives" 2010 report:

1. Give every child the best start in life
2. Enable all children, young people and adults to maximise their capabilities and have control over their lives
3. Create fair employment and good work for all
4. Ensure healthy standard of living for all
5. Create and develop healthy and sustainable places and communities
6. Strengthen the role and impact of ill-health prevention.

2.1.7 The JHWS covers the period 2016 to 2021. It defines four long-term ambitions:

1. Create and sustain good mental and physical health for children and adults at every stage of life
2. Reduce health inequalities by improving outcomes for neighbourhoods and communities experiencing poor health
3. Enable people of working age to participate as fully as possible in working life, to improve the health and economic outcomes for them and their families

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4. Enable everyone to be healthy and independent for as long as possible, helping to prevent or delay the need for social and acute care.

2.1.8 There are four priority areas for action:

1. Develop a systems leadership approach to Health and Wellbeing
2. Make more extensive use of educational settings and workplaces as health-promoting environments
3. Address the broader social, economic, and environmental factors that can support people's ability to be healthy and make changes to improve their health
4. Support residents and communities to manage their health, prevent ill health and recover quickly from ill health.

Data on deprivation, health assets, wider determinants of health

2.1.9 The health of people in Ealing is varied compared with the England average. About 21% (14,800) of children live in low income families. Life expectancy for both men and women is higher than the England average. Life expectancy is 3.9 years lower for men and 2.5 years lower for women in the most deprived areas of Ealing than in the least deprived areas. PHE data on health assets and the determinants of health are in general in line with the national average. However, the percentage of people who use services who have control over their daily lives is lower. There are also high rates of air pollution and more overcrowded householders and injuries due to falls among older people than the national average.

London Borough of Hounslow

The JSNA and JHWS

2.1.10 The JSNA covers the area of the borough and was updated in 2017.The JSNA defines the following priority needs that were selected according to three criteria; needs that affect more than 200 people, AND have a serious impact on personal health, AND have poorly performing quantitative outcomes.

1. Cardiovascular and respiratory disease
2. Falls
3. Dementia
4. School readiness
5. Accidents in children aged 0-14
6. Obesity in children and adults

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7. Physical activity
8. Air quality and noise
9. Cancer
10. Intimate partner violence
11. Termination of pregnancy
12. Learning disabilities.

2.1.11 The existing JHWS covers the period 2013 to 2017. It focuses on three key priorities:

1. Reduced differences in life expectancy between communities
2. Every child has the best possible start in life
3. Adults retain their independence and good health for longer.

Data on deprivation, health assets, wider determinants of health

2.1.12 The health of people in Hounslow is varied compared with the England average. About 21% (11,500) of children live in low income families. Life expectancy for women is higher than the England average. Life expectancy is 5.3 years lower for men and 4.6 years lower for women in the most deprived areas of Hounslow than in the least deprived areas. PHE data on health assets and the determinants of health are in general in line with the national average. However, a Hounslow has a lower percentage of people who use services who have control over their daily lives. Hounslow also has the worst measures for exposure to road, rail and air transport noise during the night in England. There are also more overcrowded householders and injuries due to falls among older people than the average for England.

Spelthorne Borough Council

The JSNA and JHWS

2.1.13 The JSNA covers the county of Surrey. It is a continuous process and is updated as additional information becomes available. The JSNA is structured in 30 sections. Some of these focus on particular health needs (e.g. sexual and reproductive health), others some on the needs of groups (e.g. adult carers) and others on the social determinants of health (e.g. economy, employment and deprivation).

2.1.14 The JHWS covers the Spelthorne Borough area and the period 2016 to 2019. In includes the following key priorities:

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1. A borough where health inequalities are reducing amongst all ages
2. Develop a preventative approach (to prevent ill health and promote wellness
3. Improve emotional and mental wellbeing
4. Safeguarding the population.

Data on deprivation, health assets, wider determinants of health

2.1.15 The health of people in Spelthorne is varied compared with the England average. About 14% (2,400) of children live in low income families. Life expectancy for both men and women is higher than the England average areas. Life expectancy is 6.2 years lower for men and 5.0 years lower for women in the most deprived areas of Spelthorne than in the least deprived. PHE data on health assets and the determinants of health for Surrey are generally better than the national average. The number killed and seriously injured on the roads is higher than the average for England.

Slough Borough Council

The JSNA and JHWS

2.1.16 The JSNA covers the area of the borough and the current version was updated in 2016. The JSNA states public health priorities include:

1. Crime reduction (violent crime and domestic abuse)
2. Childhood obesity and oral health
3. Child and parental mental health
4. Prevention of and reduction of early deaths from cardiovascular disease.

2.1.17 The JSNA also includes sections on healthcare needs, population characteristics, social determinants of health and population groups, outlining unmet needs and recommendations.

2.1.18 The JHWS covers the period 2016 to 2020. It includes the following key priorities:

1. Protecting vulnerable children
2. Increasing life expectancy by focusing on inequalities
3. Improving mental health and wellbeing
4. Housing.

2.1.19 It addresses these using five key principles:

1. Focus on prevention, early intervention and health promotion

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2. Provide opportunities for individual and community empowerment and volunteering
3. Promote a culture of self care and personal responsibility
4. Achieve more for less by making the very best use of resources
5. Engage in an on-going dialogue with our residents, communities and patients.

Data on deprivation, health assets, wider determinants of health

2.1.20 The health of people in Slough is varied compared with the England average. About 19% (6,900) of children live in low income families. Life expectancy for men is lower than the England average. Life expectancy is 6.5 years lower for men and 4.1 years lower for women in the most deprived areas of Slough than in the least deprived areas. PHE data on health assets and the determinants of health are in general in line with the average for England.

The Royal Borough of Windsor and Maidenhead

The JSNA and JHWS

2.1.21 The JSNA covers the borough. It was updated in 2017. The JSNA is divided into chapters which are further divided into sections. The chapters are structured using a life course approach:

1. Starting well
2. Developing well
3. Living and working well
4. Ageing well.

2.1.22 There is also a section on the wider determinants of health and vulnerable groups. Each of these sections includes between one and 20 recommendations aimed at the Local Planning Authority, the Clinical Commissioning Group (CCG), specific service providers and departments and other organisations.

2.1.23 The JHWS covers the period 2016 to 2020. It includes 3 themes and 12 Priorities Provide the Framework for Action (page 8):

1. Theme 1 - Supporting a healthy population
   a. Priority 1 – Enable more children and adults to be at a healthy weight
   b. Priority 2- Lower risky levels of alcohol intake.
   c. Priority 3 - Get more people to be more active more often

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d. Priority 4- Empower people to be educated to 'Self Care'

2. Theme 2 - Prevention and early intervention

e. Priority 5 – Enable a reduction in levels of cardiovascular disease

f. Priority 6 -Support people to have early diagnosis of dementia

g. Priority 7 – Support adults and children with mental health needs

h. Priority 8 – Assist and empower people with long term conditions

3. Theme 3 - Enable residents to maximise their capabilities and life chances

i. Priority 9 – Facilitate participation in education, training, work, social and community activities

j. Priority 10 – Support carers of all ages

k. Priority 11 – Enable health and wellbeing through regeneration and sustainable planning, including housing

l. Priority 12- Promote and enable greater independence for people.

Data on deprivation, health assets, wider determinants of health

2.1.24 The health of people in Windsor and Maidenhead is generally better than the England average. Windsor and Maidenhead is one of the 20% least deprived districts/unitary authorities in England, however about 9% (2,400) of children live in low income families. Life expectancy for both men and women is higher than the England average. Life expectancy is 5.8 years lower for men and 4.8 years lower for women in the most deprived areas of Windsor and Maidenhead than in the least deprived areas. PHE data on health assets and the determinants of health are in general better than the average for England. However, it has lower rates of utilization of outdoor space for exercise.

Runnymede Borough Council

The JSNA and JHWS

2.1.25 The JSNA covers the county of Surrey, which also covers Spelthorne. It is a continuous process and is updated as additional information becomes available. The JSNA is structured in 30 sections. Some of these focus on particular health needs (e.g. sexual and reproductive health), others some on the needs of groups (e.g. adult carers) and others on the social determinants of health (e.g. economy, employment and deprivation).

2.1.26 The JHWS was refreshed in 2016. In includes five priorities:

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1. Improving children's health and wellbeing
2. Developing a preventative approach
3. Promoting emotional wellbeing and mental health
4. Improving older adults' health and wellbeing
5. Safeguarding the population.

Data on deprivation, health assets, wider determinants of health

2.1.27 The health of people in Runnymede is generally better than the England average. Runnymede is one of the 20% least deprived districts/unitary authorities in England, however about 12% (1,600) of children live in low income families. Life expectancy for both men and women is higher than the England average. Life expectancy is 6.2 years lower for men and 5.7 years lower for women in the most deprived areas of Runnymede than in the least deprived areas. PHE data on health assets and the determinants of health for Surrey are generally better than the national average. The number killed and seriously injured on the roads is higher than the average for England.

London Borough of Hillingdon

The JSNA and JHWS

2.1.28 The JSNA covers the London Borough of Hillingdon. Sections are updated regularly when new information becomes available. It includes seven priority themes:

1. Promoting healthier lifestyles
2. Improved co-ordination of joint health and social care working
3. Safeguarding, prevention and protection
4. Community-based, resident-focussed services
5. Promoting economic resilience
6. Preserving and protecting the environment
7. Reducing disparities in health outcomes.

2.1.29 The existing JHWS covers the period 2014 to 2017 (a draft strategy for the period 2018 to 2021 is available but has not been finalised). The strategy includes four priorities:

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1. Improve health and wellbeing and reduce inequalities - we know that people will feel better and be healthier if they are more active and are able to access facilities across Hillingdon
2. Invest in prevention and early intervention – we need to spend more on preventing disease and illness. The sooner health and social care are delivered, the better the chance of a good outcome
3. Develop integrated, high quality social care and health services within the community or at home - the Care Act 2014 is designed to create a more joined up set of services for our patients, their families and carers. We want to make this the normal experience for the people of Hillingdon
4. Creating a positive experience of care - we will tailor our services in a more personalised way which will be achieved by listening to views and experiences.

Data on deprivation, health assets, wider determinants of health

2.1.30 The health of people in Hillingdon is varied compared with the England average. About 20% (12,000) of children live in low income families. Life expectancy for both men and women is higher than the England average. Life expectancy is 6.1 years lower for men and 5.5 years lower for women in the most deprived areas of Hillingdon than in the least deprived areas. PHE data on health assets and the determinants of health for Hillingdon in general show similar values to the England average. However, there are a higher percentage of overcrowded households.

London Borough of Richmond upon Thames

The JSNA and JHWS

2.1.31 The JSNA covers the London Borough of Richmond upon Thames. Sections are updated regularly when new information becomes available. The JSNA outlines the specific aim to: Enable people to have access to high-quality information and lifestyle interventions that prevent their health and care needs becoming serious. It includes priorities to create healthy communities – harnessing local community assets to support people and their carers and re-shape healthy lifestyles services and embedding self-care. It includes recommendations and conclusions in most of its sections on needs assessments, rather than priorities.

2.1.32 The JHWS covers the period 2016 to 2021. It includes priorities and proposed action around three themes: Start Well which covers child and family services; Live Well which includes prevention services and healthy environments; and Age Well which focuses on integrating health and social care services, carers and helping people age well.

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Data on deprivation, health assets, wider determinants of health

2.1.33 The health of people in Richmond upon Thames is generally better than the England average. Richmond upon Thames is one of the 20% least deprived districts/unitary authorities in England, however about 10% (3,300) of children live in low income families. Life expectancy for both men and women is higher than the England average. Life expectancy is 5.8 years lower for men and 3.3 years lower for women in the most deprived areas of Richmond upon Thames than in the least deprived areas. PHE data on health assets and the determinants of health for Richmond upon Thames in general show better values to the England average. However, the utilisation of outdoor space for exercise and health reasons is lower than the average for England.

London Borough of Wandsworth

The JSNA and JHWS

2.1.34 The JSNA covers the London Borough of Wandsworth. The section on children dates from 2015 and the other sections from 2014. The JSNA does not include priorities as such. It includes key messages around of health needs (e.g. mental health, childhood immunisation), diseases (e.g. TB), vulnerable groups (e.g. looked after children) and determinants of health (e.g. access to open spaces).

2.1.35 The existing JHWS covers the period 2015 to 2020. It includes three priorities with defined areas of action:

1. Healthy Places. We will work to ensure regeneration and development schemes are opportunities to improve people's health and wellbeing. Action on:
   m. Urban design
   n. Healthy homes
   o. Building community assets
   p. Health protection
2. Targeted interventions. We will identify the people most in need and deliver holistic programmes that address their health needs. Action on:
   q. Target those in most need
   r. Support employment
   s. Intensive interventions
   t. Develop health living hubs
3. Mental health. We will make mental health as important as physical health in improving health and reducing inequalities. Action on:

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u. Prevention

v. Early intervention

w. Recovery and control

Data on deprivation, health assets, wider determinants of health

2.1.36 The health of people in Wandsworth is varied compared with the England average. About 20% (10,400) of children live in low income families. Life expectancy for women is higher than the England average. Life expectancy is 8.3 years lower for men and 5.7 years lower for women in the most deprived areas of Wandsworth than in the least deprived areas. PHE data on health assets and the determinants of health are in general in line with the average. However, it has more overcrowded households and more injuries due to falls on people aged 65 and over than the average for England.

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Table 12.1.1 Summary of health priorities and data by Local Planning Authority area

Local Planning Authority area	JSNA needs	JHWS priorities	Life expectancy and inequalities	Poorer health assets and determinants of health than the average for England
South Bucks District Council	Sections that consist of population characteristics, social determinants of health and population groups broken down into sub-sections on specific determinants, population sub-groups or disease area. These sub-sections in some cases include conclusions and in others, recommendations.	Give every child the best start in life Keep people healthier for longer and reduce the impact of long term conditions Promote good mental health and wellbeing for everyone Protect residents from harm Support communities to enable people to achieve their potential and ensure Buckinghamshire is a great place to live.	One of the 20% least deprived districts/unitary authorities in England. Life expectancy is 5.8 years lower for men and 7.2 years lower for women in the most deprived areas than in the least deprived areas	The number killed and seriously injured on the roads is higher than the average for England.
London Borough of Ealing	Give every child the best start in life Enable all children, young people and adults to maximise their capabilities and have control over their lives Create fair employment and good work for all Ensure healthy standard of living for all Create and develop healthy and sustainable places and communities	Create and sustain good mental and physical health for children and adults at every stage of life Reduce health inequalities by improving outcomes for neighbourhoods and communities experiencing poor health Enable people of working age to participate as fully as possible in working life, to improve the health and economic outcomes for them and their families	Life expectancy for both men and women is higher than the England average. Life expectancy is 3.9 years lower for men and 2.5 years lower for women in the most deprived areas of Ealing than in the least deprived areas	The percentage of people who use services who have control over their daily lives is lower than the average for England. There are also higher rates of air pollution and more overcrowded householders and injuries due to falls among older people.

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Heathrow Expansion
Local Planning Authority health priorities

Local Planning Authority area	JSNA needs	JHWS priorities	Life expectancy and inequalities	Poorer health assets and determinants of health than the average for England
	Strengthen the role and impact of ill-health prevention	Enable everyone to be healthy and independent for as long as possible, helping to prevent or delay the need for social and acute care		
London Borough of Hounslow	Cardiovascular and respiratory disease; Falls; Dementia; School readiness; Accidents in children aged 0-14; Obesity in children and adults; Physical activity; Air quality and noise; Cancer; Intimate partner violence; Termination of pregnancy; Learning disabilities	Reduced differences in life expectancy between communities Every child has the best possible start in life Adults retain their independence and good health for longer.	Life expectancy for women is higher than the England average. Life expectancy is 5.3 years lower for men and 4.6 years lower for women in the most deprived areas of Hounslow than in the least deprived areas.	Has the worst measures for exposure to road, rail and air transport noise during the night in England, more overcrowded householders and injuries due to falls among older people than the average for England.
Spelthorne Borough Council	Structured in 30 sections. Some of these focus on particular health needs (e.g. sexual and reproductive health), others some on the needs of groups (e.g. adult carers) and others on the social determinants of health (e.g. economy, employment and deprivation).	A borough where health inequalities are reducing amongst all ages Develop a preventative approach (to prevent ill health and promote wellness Improve emotional and mental wellbeing Safeguarding the population	Life expectancy for both men and women is higher than the England average areas. Life expectancy is 6.2 years lower for men and 5.0 years lower for women in the most deprived areas than in the least deprived.	The number killed and seriously injured on the roads is higher than the average for England.
Slough Borough Council	Public health priorities include: Crime reduction (violent crime and domestic abuse)	Protecting vulnerable children Increasing life expectancy by focusing on inequalities	Life expectancy for men is lower than the England average. Life expectancy is 6.5 years lower for men and 4.1 years lower for	

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Heathrow Expansion
Local Planning Authority health priorities

Local Planning Authority area	JSNA needs	JHWS priorities	Life expectancy and inequalities	Poorer health assets and determinants of health than the average for England
	Childhood obesity and oral health Child and parental mental health Prevention of and reduction of early deaths from cardiovascular disease.	Improving mental health and wellbeing Housing	women in the most deprived areas than in the least deprived areas	
The Royal Borough of Windsor and Maidenhead	Recommendations structured according to: 1. Starting well 2. Developing well 3. Living and working well 4. Ageing well	3 themes with 12 priorities: Theme 1 - Supporting a healthy population Theme 2 - Prevention and early intervention Theme 3 - Enable residents to maximise their capabilities and life chances	One of the 20% least deprived districts/unitary authorities in England: Life expectancy for both men and women is higher than the England average. Life expectancy is 5.8 years lower for men and 4.8 years lower for women in the most deprived areas than in the least deprived areas	lower rates of utilization of outdoor space for exercise than the average for England.
Runnymede Borough Council	Structured in 30 sections. Some of these focus on particular health needs, others some on the needs of groups and others on the social determinants of health.	Improving children's health and wellbeing Developing a preventative approach Promoting emotional wellbeing and mental health Improving older adults' health and wellbeing Safeguarding the population.	One of the 20% least deprived districts/unitary authorities in England. Life expectancy for both men and women is higher than the England average. Life expectancy is 6.2 years lower for men and 5.7 years lower for women in the most deprived areas than in the least deprived areas.	The number killed and seriously injured on the roads is higher than the average for England.

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Heathrow Expansion
Local Planning Authority health priorities

Local Planning Authority area	JSNA needs	JHWS priorities	Life expectancy and inequalities	Poorer health assets and determinants of health than the average for England
London Borough of Hillingdon	Promoting healthier lifestyles Improved co-ordination of joint health and social care working Safeguarding, prevention and protection Community-based, resident-focussed services Promoting economic resilience Preserving and protecting the environment Reducing disparities in health outcomes.	Improve health and wellbeing and reduce inequalities Invest in prevention and early intervention Develop integrated, high quality social care and health services within the community or at home Creating a positive experience of care	Life expectancy for both men and women is higher than the England average. Life expectancy is 6.1 years lower for men and 5.5 years lower for women in the most deprived areas than in the least deprived areas.	Higher percentage of overcrowded households than the average for England.
London Borough of Richmond upon Thames	Outlines the specific aim to: Enable people to have access to high-quality information and lifestyle interventions that prevent their health and care needs becoming serious. It includes recommendations and conclusions in most of its sections on needs assessments, rather than priorities.	Priorities and proposed action around three themes: Start Well which covers child and family services Live Well which includes prevention services and healthy environments Age Well which focuses on integrating health and social care services, carers and helping people age well.	One of the 20% least deprived districts/unitary authorities in England. Life expectancy for both men and women is higher than the England average. Life expectancy is 5.8 years lower for men and 3.3 years lower for women in the most deprived areas than in the least deprived areas. PHE	The utilisation of outdoor space for exercise and health reasons is lower than the average for England.
London Borough of Wandsworth	Includes key messages around of health needs (e.g. mental health, childhood immunisation), diseases (e.g. TB), vulnerable	Healthy Places: ensure regeneration and development schemes are opportunities to	Life expectancy for women is higher than the England average. Life expectancy is 8.3 years lower for men and 5.7	More overcrowded households and more injuries due to falls on people aged 65 and over than the average for England.

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Local Planning Authority area	JSNA needs	JHWS priorities	Life expectancy and inequalities	Poorer health assets and determinants of health than the average for England
	groups (e.g. looked after children) and determinants of health (e.g. access to open spaces).	improve people's health and wellbeing Targeted interventions: identify the people most in need and deliver holistic programmes that address their health needs Mental health: make mental health as important as physical health in improving health and reducing inequalities	years lower for women in the most deprived areas than in the least deprived areas.	

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Common health priority themes across Local Planning Authorities

2.1.37 The JSNAs and JHWSs for the ten Local Planning Authority areas included in the review use different types of information and data and do not present their findings in a similar way. This makes it difficult to compare them systematically. However, it is possible to draw out common themes in the needs highlighted by the JSNAs and priorities identified in the JHWSs. These common themes include:

1. The need to focus on prevention of disease and early death through actions such as encouraging exercise, lowering risky levels of alcohol intake, smoking cessation services and early diagnosis
2. The importance of meeting the needs of children, including tackling childhood obesity, promoting positive mental health, ensuring children are school-ready and supporting vulnerable families
3. The prioritisation of mental health, including promoting positive mental health and improving mental health services
4. The importance of addressing the needs of older people, including enabling independence in older age, safeguarding older people, reducing excess winter death and improving care and support
5. The need to address inequalities in health including targeting communities experiencing poor health, children living in poverty and deprived neighbourhoods
6. The recognition of the importance of addressing the wider determinants of health by promoting environments that are green, safe and clean, access to transport, employment and training opportunities and housing
7. The use of the life-course approach to understanding how an individual's health needs change as they age
8. Identifying and meeting the needs of vulnerable groups with particular needs, including looked after children, people with learning disabilities and frail older people.

Overview of local areas' priorities relating to relevant determinants of health

2.1.38 The review of health priorities also searched JSNAs and JHWSs to identify to what extent local areas prioritise needs associated with the determinants of health which may be impacted be the development. This search was based on those determinants of health the construction and the operation phases are anticipated to influence. This was carried out by key word searches. The pathways by which a change in the determinant creates a potential impact on health were also considered. Key findings are explained below and summarised in Table 12.1.2.

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Relevant priorities identified in the JSNAs and JHWSs are not categorised as to whether they relate to the construction or operation phase as in most cases they relate to both.

1. All local areas identify the environment as an important determinant of health in their JSNAs and/or JHWSs. All local areas recognise the need to ensure good air quality. Some also recognise control noise pollution and improve environmental amenity
2. All local areas identify lifestyle as an important determinant of health. All local areas include the need to promote physical activity in their JSNAs and/or JHWSs
3. All local areas identify the economy as an important determinant of health in their JSNAs and/or JHWSs. All local areas include the need for employment opportunities for their residents
4. Most local areas identify access to services as an important determinant of health in their JSNAs and/or JHWSs
5. While none of the local areas make reference to residential relocation in their JSNAs and/or JHWSs, they all include some reference to the importance of housing
6. Some of the areas refer to social cohesion in their JSNAs and/or JHWSs by highlighting the need for community networks and empowerment
7. Some of the areas identify safety as a determinant of health in their JSNAs and/or JHWSs through reference to road traffic incidents and the need to reduce these.

Table 12.1.2: Summary table of local areas' prioritises relating to relevant determinants of health

Determinant of health	Health pathway	Summary of inclusion in JSNAs and JHWSs
Access to services	Access to services and healthcare	Most local areas identify access to services as an important determinant of health
Economy	Employment	All local areas identify the economy as an important determinant of health in their JSNAs and/or JHWSs. All local areas include the need for employment opportunities for their residents.
Environment	Air quality	All local areas refer to the need to ensure good air quality

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Determinant of health	Health pathway	Summary of inclusion in JSNAs and JHWSs
	Noise	Some local areas refer to the need to control noise pollution
	Environmental amenity	Some local areas refer to ensure good environmental amenity
Lifestyle	Physical activity	All local areas include the need to promote physical activity
	Air travel	None identified
Living conditions	Residential relocation	No local areas include specific priorities related to residential relocation required by the development. All areas recognise housing as a need
Social cohesion	Perceptions and sense of place	Recognised by some local areas
	Community networks	Recognised by some local areas
	Viability of remaining communities	None identified
Safety	Road traffic incidents	Some of the areas refer to road traffic incidents and the need to reduce these

Summary of local areas' health priorities related to Heathrow Airport

2.1.39 The review of health priorities also searched JSNAs and JHWSs to identify any health needs or priorities that relate explicitly to the current operation and future development of Heathrow Airport. Eight of the ten local areas' JSNAs and/or JHWSs include specific mention of Heathrow Airport. These relate to issues including:

1. The need to work to minimise the impact and gain mitigation measures for the expansion in terms of noise, air quality and increased traffic
2. The need to ensure development increases local employment and training opportunities
3. The need to improve air quality and concern that major sources of air pollution, including Heathrow Airport, are outside the control of local areas
4. The need to gain noise mitigation measures
5. Recognition of the role of Heathrow as a provider of employment to many residents
6. Recognition of the significant impact of Heathrow on local economies

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7. Description of transport routes to Heathrow affecting local areas
8. Concern about the air quality impacts of commuting to Heathrow through local areas
9. Concern about the pollution and noise caused road traffic travelling to Heathrow
10. Identification of clusters of sex workers in areas close to Heathrow
11. Identification of unaccompanied asylum seeking children in the context of proximity to Heathrow.

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3. REFERENCES

Table 12.1.3 Links to JSNAs and JHWSs

Local Planning Authority area	Link to JHWS	Link to JSNA
South Bucks District Council	https://www.buckscc.gov.uk/media/4509402/jhws2017april.pdf	http://www.healthandwellbeingbucks.org/s4s/WhereILive/Council?pageId=2098
London Borough of Ealing	https://www.ealing.gov.uk/downloads/download/3755/health_and_wellbeing_strategy	https://www.ealing.gov.uk/info/201072/strategies_plans_and_policies/1963/ealings_joint_strategic_needs_assessment
London Borough of Hounslow	https://www.hounslow.gov.uk/downloads/file/192/joint_health_and_wellbeing_strategy	https://www.hounslow.gov.uk/info/20049/health_and_well_being/1513/joint_strategic_needs_assessment
Spelthorne Borough Council	https://www.spelthorne.gov.uk/article/12131/Health-and-Wellbeing-Strategy	https://www.surreyi.gov.uk/ViewPage1.aspx?C=Resource&ResourceID=1756
Slough Borough Council	http://www.slough.gov.uk/council/strategies-plans-and-policies/slough-joint-wellbeing-strategy.aspx	https://www.slough.gov.uk/council/joint-strategic-needs-assessment/
The Royal Borough of Windsor and Maidenhead	https://www3.rbwm.gov.uk/downloads/download/37/joint_health_and_wellbeing_strategy_jhws	https://www3.rbwm.gov.uk/publichealth/info/11/joint_strategic_needs_assessment
Runnymede Borough Council (Surrey's Health and Wellbeing Strategy)	https://www.healthysurrey.org.uk/about/strategy	https://www.surreyi.gov.uk/ViewPage1.aspx?C=Resource&ResourceID=1756
London Borough of Hillingdon	https://www.hillingdon.gov.uk/article/25636/Health-and-social-care	https://www.hillingdon.gov.uk/jsna
London Borough of Richmond upon Thames	http://www.richmond.gov.uk/joint_health_and_wellbeing_strategy	https://www.richmond.gov.uk/jsna
London Borough of Wandsworth	http://www.wandsworth.gov.uk/downloads/file/11850/joint_health_and_wellbeing_strategy	http://www.wandsworth.gov.uk/jsna

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Appendix 14.1
Land Quality Approach to Human Health and Controlled Waters Risk Assessment

The content of this appendix was originally produced in December 2017 and issued to the Environment Agency and Local Planning Authorities for their consideration. The final content of this appendix has been updated to address and incorporate the comments received (**Appendix 14.2: Land Quality Environment Agency correspondence** and **Appendix 14.3: Land Quality Local planning authorities correspondence**). The updated report therefore also reflects the description of the DCO Project and some of the terminology presented in Volume 1 of this Scoping Report which may differ from the point in time that the original content was produced.

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1. INTRODUCTION

1.1.1 This document has been prepared to detail the approach to controlled waters risk assessment (CWRA) and human health risk assessment (HHRA) for use during the Quantitative Risk Assessment (QRA) element of the land quality assessment which will be undertaken as part of the Environmental Impact Assessment (EIA) for the DCO Project.

1.1.2 The methodologies for the CWRA and HHRA presented in this document have been developed to meet the requirements of the UK legislative framework for the assessment and management of potentially contaminated land (an overview of which is presented in this document) and incorporate current best practice including statutory and non-statutory guidance and codes of good practice.

1.1.3 The land quality risk assessment approach outlined in this document is intended to provide the framework for the assessment of potential land contamination risks associated with the DCO Project. Construction related activities, acute risks to construction staff and construction health and safety will be addressed separately within the EIA and managed in line with the Construction Design and Management (CDM) Regulations, 2015.

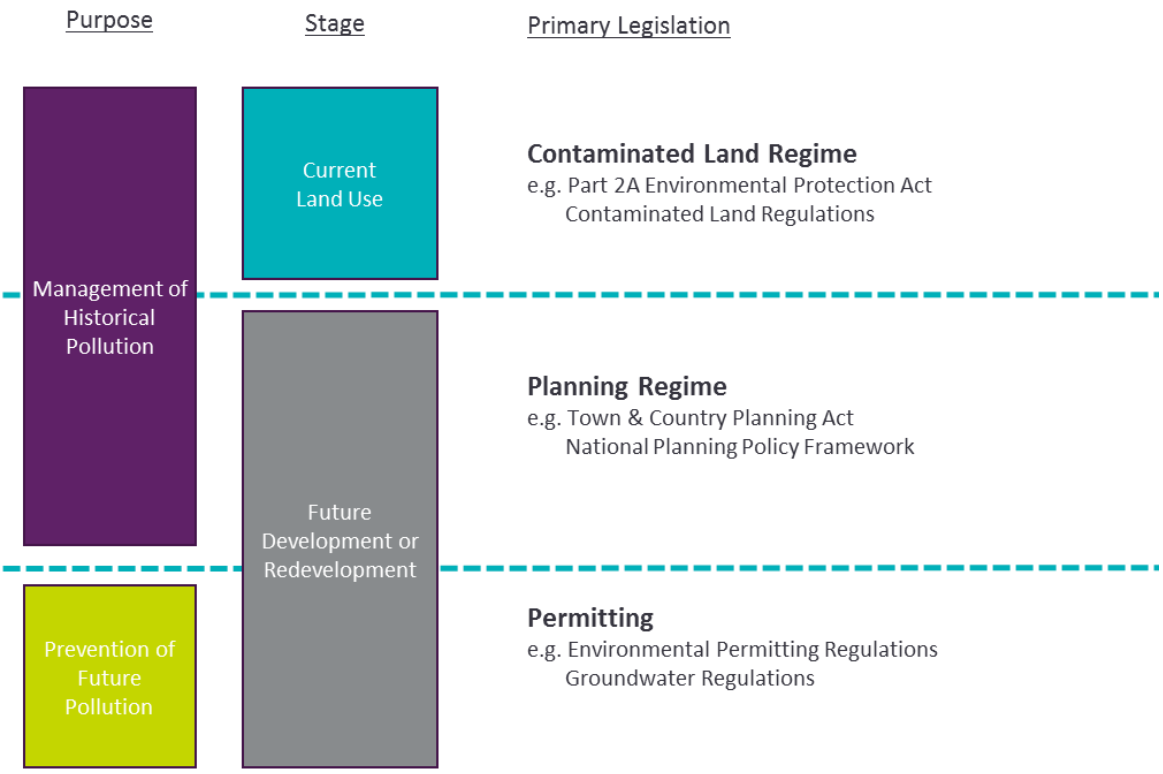
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2. LEGISLATIVE CONTEXT

2.1 Overview

2.1.1 Land contamination in the UK is regulated under a number of legislative regimes, most notably the Contaminated Land Regime, Planning Regime and Environmental Permitting Regulations. Each of these focusses on different aspects of land contamination from the management of historical contamination to the potential of future contamination. Graphic 14.1.1 provides a generalised summary of the application of each regime.

Graphic 14.1.1 Land contamination legislation overview



2.1.2 The methodologies presented in this document are intended to assess and mitigate potential land contamination risks associated with the completed DCO Project which may arise from historical contamination. The prevention of future pollution under UK legislation will be managed through 'embedded' and 'best practice' mitigation and, where required for the construction/operation activities, environmental permits (e.g. discharge consents etc).

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2.1.3 For the purposes of the CWRA, the meaning "controlled waters" is per Part III, Section 104 of the Water Resources Action 1991.

2.2 Environmental Protection Act 1990: Part 2A

2.2.1 Part 2A of the Environmental Protection Act 1990 (Part 2A) provides the regulatory basis for the identification, designation and remediation of Contaminated Land.

2.2.2 "Contaminated Land" is defined in Part 2A as "*land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that – (a) significant harm is being caused or there is a significant possibility of such harm being caused; or (b) significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused*;"

2.2.3 For risks to human health, Part 2A defines "Harm" to mean "*harm to the health of living organisms or other interference with the ecological systems of which they form part and, in the case of man, includes harm to his property*".

2.2.4 For risks to controlled waters, significant pollution is defined in Part 2A as:

1. Pollution equivalent to 'environmental damage' to surface water or groundwater as defined by The Environmental Damage (Prevention and Remediation) Regulations 2009, but which cannot be dealt with under those Regulations
2. Inputs resulting in deterioration of the quality of water abstracted, or intended to be used in the future, for human consumption such that additional treatment would be required to enable that use
3. A breach of a statutory surface water Environment Quality Standard, either directly or via a groundwater pathway
4. Input of a substance into groundwater resulting in a significant and sustained upward trend in concentrations of contaminants (as defined in Article 2(3) of the Groundwater Daughter Directive (2006/118/EC)).

2.2.5 Part 2A takes a risk based approach to defining contaminated land where "risk" means the combination of (a) the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land; and (b) the scale and seriousness of such harm or pollution if it did occur.

2.2.6 Under Part 2A risks should only be considered in relation to the current use of the land.

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2.3 National Planning Policy Framework

2.3.1 The National Planning Policy Framework (NPPF) outlines the requirement for managing and mitigating contamination risks associated with future site uses through the planning system. The NPPF was published in 2012 and sets out the Governments planning policies for England and how these are expected to be applied. English planning law requires that applications for planning permission must be determined in accordance with the NPPF, unless material considerations indicate otherwise.

2.3.2 Specifically related to land contamination, paragraphs 120 and 121 of the NPPF state that:

Paragraph 120: "*To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effect) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rest with the developer and/or landowner*."

Paragraph 121: "*Planning policies and decisions should also ensure that:*

- *the site is suitable for its new use taking into account ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impact on the natural environment arising from that remediation.*
- *after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990*".

2.3.3 As such the NPPF prescribes the requirement to assess the impact of the future site use on human health and the environment requiring that it is assessed in the manner compliant with Part 2A.

2.4 Statutory guidance

2.4.1 The framework for the assessment of potential land contamination adopted in this document is based on current statutory guidance documents regarding the implementation of Part 2A and the assessment of potentially contaminated land within the NPPF. In particular, reference has been made to:

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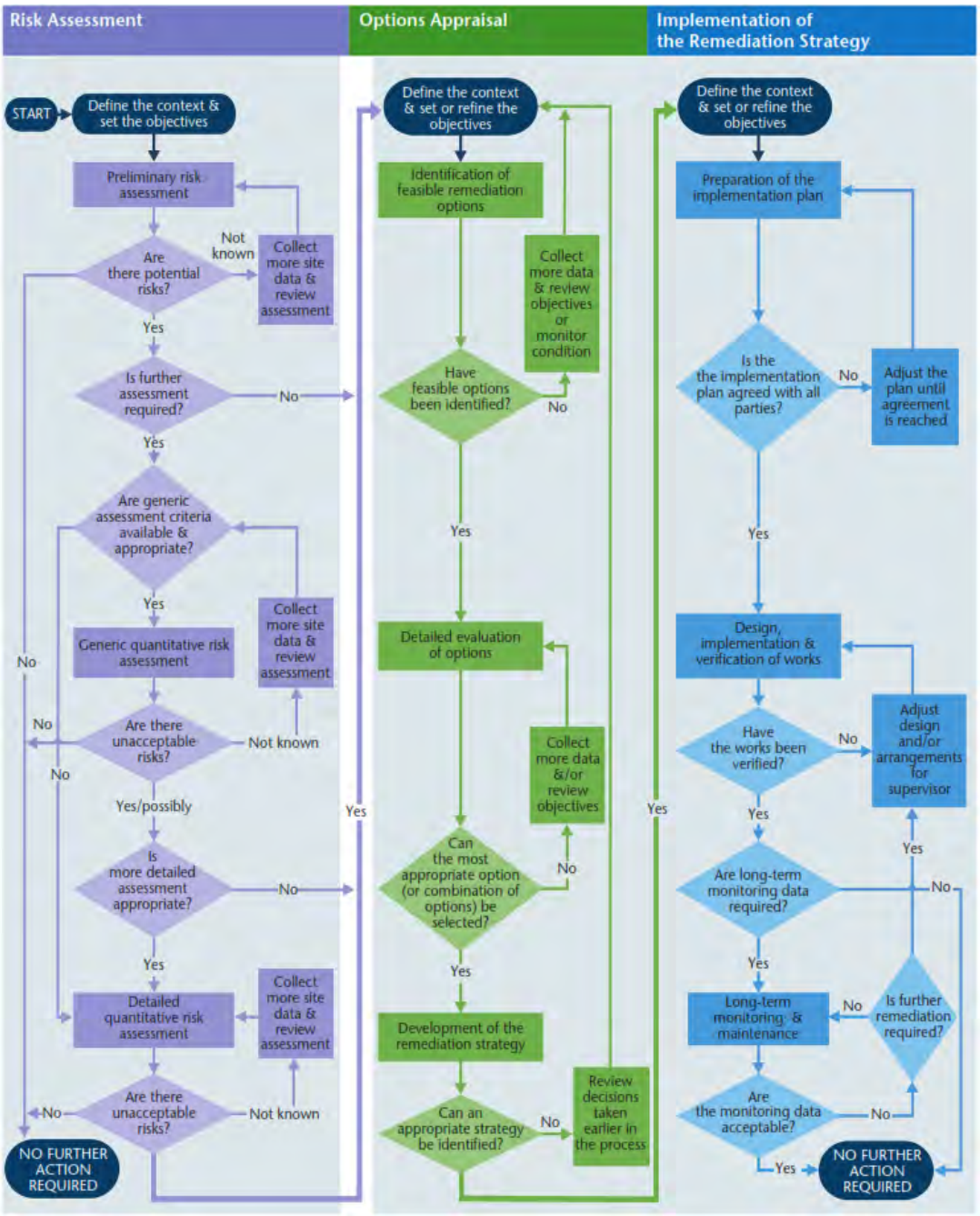
1. Defra (2012): *Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance*
2. Environment Agency (2004): *Model Procedures for the Management of Land Contamination*, Contaminated Land Report 11 (CLR11)
3. British Standard (BS) 10175:2011+A1:2013, *Investigation of Potentially Contaminated Sites*
4. Department for Communities and Local Government (2012): *National Planning Policy Framework* (NPPF).

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3. CONTAMINATED LAND RISK ASSESSMENT APPROACH

3.1.1 The assessment of potentially contaminated land will follow the phased and iterative approach set out in CLR11 (see Graphic 14.1.2).

Graphic 14.1.2 Overview of CLR11 process for managing land contamination



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3.1.2 As part of the land quality assessment, a Conceptual Site Model (CSM) will be developed representing the baseline and each of the construction and operational phase assessment years. The CSM's will be refined/revised as more information and understanding is obtained through the assessment process.

3.1.3 The CSM describes the potential contaminant sources and potential receptors that may be present as part of the DCO Project and thus the potentially active 'contaminant linkages' between these sources (contaminants) and receptors, as defined in the relevant legislation and guidance.

3.1.4 At sites where contamination may be present, site specific data will be collected through a ground investigation comprising soil, water and gas sampling and subsequent laboratory analysis to determine the concentrations of contaminants present within each media.

3.1.5 The ground investigation (including the collection and laboratory analysis of soil, water and gas samples) will be undertaken in line with current guidance and best practice including:

1. British Standard BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites
2. British Standard BS5930:2015 Code of Practice for Ground Investigations
3. Environment Agency Model Procedures for the Management of Land Contamination (CLR-11)
4. Institution of Civil Engineers, ICE, UK Specification for Ground Investigation, 2nd edition (2012).

3.1.6 The data will then be evaluated to determine whether there are unacceptable risks to human health or controlled waters which may require remediation as part of the DCO Project (the process of risk assessment).

3.1.7 A phased approach to the risk assessment will be undertaken comprising:

1. Screening out of sites where ground investigation data indicates a contaminant source is not present or there is no pollutant linkage between a source and potential receptor
2. QRA comprising an initial evaluation of data against a global site model to provide a holistic overview of the land quality risks for the CSM scenario
3. Additional assessment where data indicates a potential contamination risk remains following the initial assessment and further evaluation is needed to determine its significance and the requirement for remediation

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3.1.8 The approach to the global model and QRA, where required, is detailed in Section 4: Controlled waters risk assessment (for controlled waters) and Section 5: Human health risk assessment (for human health).

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4. CONTROLLED WATERS RISK ASSESSMENT

4.1 Site setting

4.1.1 The land being considered for the DCO Project is located in a catchment area containing several watercourses that are tributaries of the River Thames. Under the Water Framework Directive (WFD) these tributaries have been classified as either having 'Poor' or 'Moderate' overall status. Within the land being considered for the DCO Project there are also several lakes formed within areas of previous gravel workings and also reservoirs that provide storage for water supply.

4.1.2 The land required for the DCO Project is primarily located on the superficial Quaternary Taplow Gravels, a shallow unconfined gravel aquifer which forms part of a larger body of terraced river sands and gravel (the river terrace deposits) present across the current River Thames floodplain. These deposits sit on top of the Tertiary London Clay (an aquitard), itself set on the regional Chalk aquifer (which is strategically important in terms of regional water resource supply). The river terrace deposits are typically 3m to 9m thick. In contrast, the London Clay is over 30m thick and up to 80m thick in places within the land required for the DCO Project.

4.1.3 The gravel aquifer within the shallow river terrace deposits is designated as a Principal Aquifer by the Environment Agency (due to their being used for public water supply) and as a groundwater body under the WFD (the Lower Thames Gravels). Under the WFD, it is currently classified as having 'Good' status but has historically failed to achieve 'Good' status because of poor water quality resulting from historical contamination.

4.1.4 The gravel aquifer is considered to be the primary pathway by which soil derived contaminants may migrate to surface water courses. However, it should be noted that some water courses within the land required for the DCO Project have been extensively modified and channelised and therefore may not be in hydraulic continuity with the surrounding groundwater at a given point.

4.1.5 In addition, the gravel aquifer is a receptor in its own right, along with any potable groundwater abstractions from the aquifer (public or private).

4.1.6 The DCO Project will include the creation of new channels resulting in a number of existing source-pathway-receptor linkages being broken. It is noted that whilst the introduction of new water courses will create new surface water receptors, where the new water courses are channelised and hydraulically disconnected from the surrounding groundwater, in these locations, new Source-Pathway-Receptor contaminant linkages will not be created. Assessment of potential linkages to

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water courses will only be undertaken within the CWRA where they are in continuity with the surrounding groundwater.

4.2 Controlled Waters Assessment objectives

4.2.1 The controlled waters assessment will follow the principles set out in the Environment Agency's guidance document 'The Environment Agency's Approach to Groundwater Protection' (March 2017). In the context of the DCO Project these are interpreted as:

4.2.2 Where pollutants have not yet entered groundwater, all necessary and reasonable measures shall be taken to:

1. Prevent the input of hazardous pollutants into groundwater
2. Limit the entry of non-hazardous substances into groundwater so as to avoid pollution, and to avoid deterioration of the status of groundwater adjacent to the Heathrow Planning Boundary or sustained upward trends in pollutant concentration.

4.2.3 Where hazardous substances or non-hazardous substances have already entered groundwater, the priority is to:

1. Minimise further entry of hazardous substances and non-hazardous substances into groundwater
2. Take necessary and reasonable measures to limit the pollution of groundwater or impact on the status of groundwater adjacent to the Heathrow Planning Boundary from the future expansion of a contaminant plume, if necessary by actively reducing its extent.

4.2.4 Given the local geology, groundwater flow is considered the primary pathway by which pollutants may enter surface waters on site. As such the above objectives are also deemed to be protective of surface waters on site (where these are in continuity with the groundwater).

4.2.5 To achieve these objectives a global assessment model will be adopted utilising a risk based approach to the assessment of contaminated land as recommended in CLR11.

4.3 Global site model

4.3.1 The global assessment model will initially consider the land being considered for the DCO Project as a whole to identify those areas where land contamination may present a risk of pollution to controlled waters. To achieve this the concentration of

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contaminants of concern (as identified within the desk study and ground investigation) will be screened against a set of selected screening criteria. The selection of these criteria is detailed in Section 4.4. Areas where the screening criteria are exceeded will be mapped to show the spatial distribution and extent of individual contamination source zones. Each source zone will then be taken to the next phase of assessment.

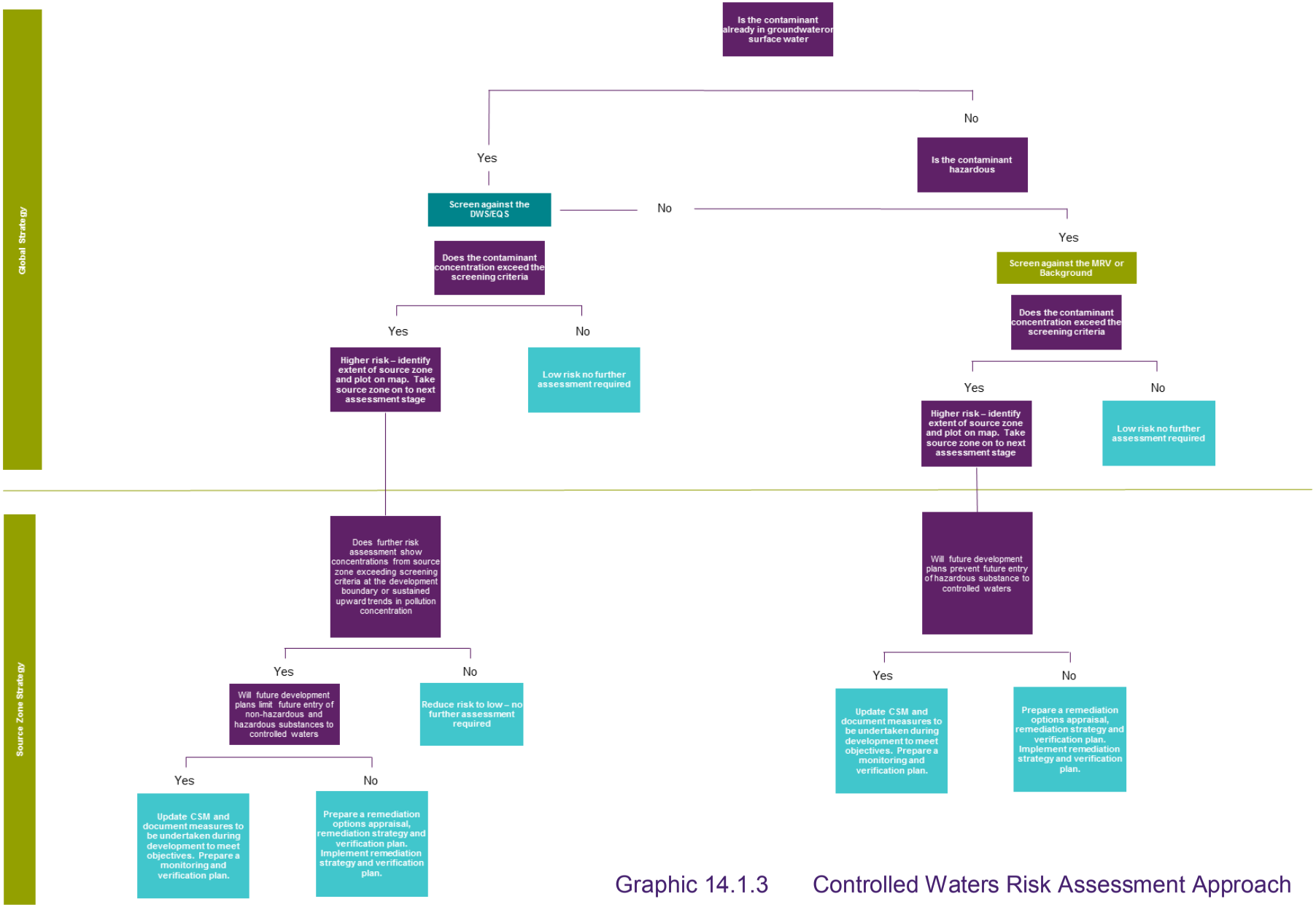
4.3.2 The next phase of assessment will look at each source zone in the context of the objectives set out above and the development proposals for that individual part of the DCO Project. Further assessment will be undertaken to identify whether contaminant concentrations identified represent a risk to surface waters and groundwater. Should risks be identified an updated CSM will be produced to identify whether pre-development measures, such as remediation, are required to meet the required objectives. This phase of assessment may require various tiers of assessment including groundwater modelling to identify the required approach.

4.3.3 The thickness of London Clay (which is of low permeability) prevents significant groundwater movement between the gravel aquifer and the regional Chalk Aquifer and is therefore considered sufficient to provide protection from the potential vertical migration of contaminants. On this basis, where the DCO Project does not extend beyond the base of the London Clay, the global site model will exclude the Chalk Aquifer as a receptor and risks to the Chalk Aquifer will not be assessed as part of the CWRA. Where the DCO Project potentially extends into the Chalk Aquifer (e.g. through piling beneath the base of the London Clay), or Ground Investigation data indicates the potential for vertical migration to occur, potential risks to the Chalk Aquifer will be considered.

4.3.4 The controlled waters risk assessment methodology is presented as a flow chart in Graphic 14.1.3

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Graphic 14.1.3 Controlled Waters Risk Assessment Approach

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4.4 Controlled Waters Risk assessment criteria

4.4.1 Risks to the water environment will be assessed by comparison of soil, groundwater and surface water concentrations to minimum reporting values (MRV) or the relevant UK Environmental Quality Standards (UK EQS) or UK Drinking Water Standards (UK DWS).

4.4.2 Given the current poor status of the gravel aquifer within and beyond the land being considered for the DCO Project, it is unlikely that a reduction in contaminant input from sources within the land being considered for the DCO Project will improve its standing as a water resource (e.g. through excavation of unlined historic landfills). However, by identifying and remediating areas that have the potential to be negatively impacting surface waters, the underlying groundwater will also see betterment of its quality.

4.4.3 That said, the Lower Thames Gravels WFD groundwater body is a drinking water protected area and therefore, groundwater quality will initially be assessed using the UK DWS screening criteria. The UK EQS have been derived as a set of criteria for assessing the quality of surface water bodies under the WFD and will be used for the initial assessment of surface water samples. They provide criteria for a set of priority substances and other polluting chemicals as listed in the Environmental Quality Standards Directive (EQSD).

4.4.4 MRV will be used to assess hazardous substances in soil by assessing soil pore water concentrations where they have not yet entered groundwater. The MRVs have been produced by the Environment Agency for selected hazardous substances in clean water. Where particular contaminants are wide spread within the water environment, consideration will be given during the assessment as to whether it would be more appropriate to use a background (up hydraulic gradient) value as the assessment criteria in this scenario. Non-hazardous substances in soil will be assessed using the UK DWS/EQS screening criteria as appropriate to the specific conceptual setting.

4.4.5 Where a more detailed quantitative risk assessment is required for a particular area or parcel of land within the DCO Project, the Environment Agency Remedial Targets Methodology (RTM) will be adopted to determine the need for remedial action, including the use of appropriate compliance criteria, compliance points and degradation rates. The risk assessment will consider the most appropriate model to use depending on the requirement to back-calculate acceptable source concentrations (using the Remedial Targets Worksheet, RTW) or predict concentrations at the receptor (using ConSim). The choice of model used will be documented in the risk assessment.

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4.4.6 The DQRA will be informed by the potential effects of each phase of the DCO Project (baseline, construction phase and the operation phase comprising the completed development) to ensure that potential changes to the groundwater flow regime as a result of the DCO Project (for example from basements to buildings) are taken into account when modelling source-pathway-receptor linkages.

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5. HUMAN HEALTH RISK ASSESSMENT

5.1 Generic Quantitative Risk Assessment (GQRA)

5.1.1 The GQRA stage will follow completion of the desk study and ground investigation. Following receipt of the ground investigation data, the first stage of the quantitative risk assessment process for human health is to compare the results of the analytical testing on soil and groundwater samples to a set of Generic Assessment Criteria (GAC).

5.1.2 GAC represent 'screening values' that have been generated using a set of conservative assumptions relating to toxicology, receptor behaviour and soil type.

5.1.3 If samples exceed the chosen screening criteria used in the GQRA, then only these will be taken forward for further assessment, and where necessary will be the subject of a Detailed Quantitative Risk Assessment (DQRA). Soil concentrations that fall beneath the chosen GAC for the particular land use will not require further assessment.

5.2 Generic Assessment Criteria for soils

5.2.1 Risks to human health will be assessed by comparison with GAC established using the UK Contaminated Land Exposure Assessment (CLEA) framework. There are a number of sources for GAC's in the UK which include values for various contaminants. A hierarchy of GACs will therefore be used as shown here and discussed further below.

1. Suitable for Use Levels (S4ULs) developed by Land Quality Management (LQM) (Nathanail, et al., 2015)
2. Category 4 Screening Levels (C4SLs); C4SLs have been developed in support of Defra's revision to the Statutory Guidance for Part 2A of the Environmental Protection Act 1990
3. GACs historically developed by CL:AIRE, AGS, and EIC in 2009.

5.2.2 Where the above listed GAC are not available for certain contaminants, then European standards, US standards and then standards from the rest of the world would be used (albeit with caution); although it is generally expected that these latter values would rarely be used and it is likely that the derivation of in-house criteria through appropriate use of modelling would be undertaken prior to using non-UK standards.

5.2.3 In all cases, for each contaminant and land use scenario, the assessment will document which GAC has been selected and its source.

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5.2.4 Suitable for Use Levels (S4ULs) have been developed by Land Quality Management (LQM) (Nathanail, et al., 2015) in accordance with the CLEA framework to replace the withdrawn 2009 LQM/CIEH GAC values. Where equivalent assessment criteria exist, S4ULs would be used as a preference as they represent more conservative values based on the principles of “minimal” or “tolerable” risk enshrined within the Environment Agency’s Science Report 2 (SR2, 2009). This ensures that the resulting assessment criteria are 'suitable for use' under planning. The values are intended as “trigger values” above which further assessment of the risks may be needed. For each contaminant, S4ULs and GACs have been calculated for the four standard land use scenarios published within the Environment Agency’s CLEA model (SR3, 2009) and the S4ULs also include two new land uses for public open space developed by Defra.

5.2.5 In the case of the Lead, there is no published S4UL which would take precedence in the GAC hierarchy. Therefore, for Lead only, this will be assessed by reference to Category 4 Screening Levels (C4SLs); C4SLs have been developed in support of Defra’s revision to the Statutory Guidance for Part 2A of the Environmental Protection Act 1990. The revised guidance presents a four-category system for determining land as contaminated land under Part 2A, ranging from Category 4 (the level of risk posed is acceptably low) to Category 1 (the level of risk is clearly unacceptable). The C4SLs provide criteria to determine whether contamination risks are low and definitely do not represent contaminated land (i.e. contaminant concentrations do not present a Significant Possibility of Significant Harm). The published C4SLs, S4ULs, GACs and SGVs are therefore conservative thresholds.

5.2.6 LQM states that the GAC are “broadly equivalent to the Soil Guideline Values”. Defra recognises the use of the LQM and CL:AIRE GAC through statutory guidance thereby providing authoritative backing to their use in appropriate circumstances.

5.2.7 In terms of land use, it is likely that GAC for light industrial or commercial end use would apply to much of the DCO Project, although public open space (park) would be used where soft landscaping areas are proposed to ensure that the likely exposure scenarios are appropriate to the type of development on land within the DCO Project. These end uses are considered conservative in this assessment as the likely exposure scenarios relate to:

1. Commercial land use – the model assumes the critical receptor in this case is an adult female with exposure duration of 49 years and takes into account exposure pathways including direct contact skin with soil and dust, inhalation of soils dusts and vapours.
2. Public open space (park) – users of the airport may come into contact with areas of soft landscaping following construction. The model assumes the

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critical receptor is a female child (0-6 years old) and takes into account exposure pathways including direct soil ingestion, skin contact with soils and inhalation of dust and vapours.

5.2.8 However, where necessary, additional land uses will be considered, for example when evaluating risks to construction workers in temporary accommodation.

5.2.9 Soil organic matter (SOM) would be assessed as part of the proposed ground investigation and the corresponding SOM dependent GAC used accordingly.

5.3 Generic Assessment Criteria for groundwater

5.3.1 There are currently no formally published UK GAC for the assessment of vapour risk arising from volatile contaminants in groundwater (GACgwvap). In 2017, the Society of Brownfield Risk Assessment (SOBRA) published the *Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater*.

5.3.2 The publication presents a methodology and GACgwvap that risk assessors may use to help in the assessment of chronic health risks from the inhalation of vapours arising from groundwater.

5.3.3 Volatile contaminants in groundwater have the potential to cause risk to human health *via* volatilisation and migration of vapours into overlying buildings or outdoor air space followed by inhalation.

5.3.4 The GACgwvap are intended for comparison with measured groundwater concentrations and represent the estimated concentration in groundwater below which the long-term risks to human health from vapour migration and inhalation can be considered low/tolerable, i.e. unlikely to be of concern (for the land use scenarios considered).

5.3.5 The GACgwvap have been developed in line with UK risk assessment guidance (e.g. Defra and Environment Agency, 2004; Environment Agency, 2009a) and are intended to be used for sites in the UK. The GACgwvap have been derived for two land use scenarios for which the vapour intrusion pathway is likely to require assessment: residential and commercial.

5.3.6 It is noted that the GACgwvap have not been derived to determine if remediation is necessary nor used as remediation targets, whereby a DQRA would be required. Within their report SOBRA also caution that in some instances groundwater concentrations may be lower than the GACgwvap but an expose risk may remain. For this reason, the GACgwvap for commercial end-use will only be used to inform the GQRA for the DCO Project and a detailed CSM and understanding of the site-

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specific ground conditions will be used to determine where further DQRA/remediation may be required.

5.4 Assessment of data

5.4.1 The incoming data will be screened against the GAC's identified above and exceedances highlighted. This screening will identify chemical variations in soils spatially across the land being considered for the DCO Project and:

1. Locations where significantly elevated concentrations of contaminants above background are present and/or
2. Locations where a number of contaminants are all present in elevated concentrations.

5.4.2 In order to identify if these areas of contamination represent gross impacts or hotspots, consideration will be given to statistical analysis of data. Statistical analysis may not be appropriate in all instances and will be assessed based upon the number of samples, contaminant of concern and distribution of data. Assessment may be based upon *CL:AIRE Guidance on Comparing Soil Contamination Data with a Critical Concentration* (CL:AIRE, 2008).

5.5 Detailed Quantitative Risk Assessment (DQRA)

5.5.1 If unacceptable risks remain, taking into consideration the proposed construction methodologies which may include:

1. Capping of areas of the site, breaking the pathway to human health receptors or
2. Use of appropriate construction techniques to mitigate potential risks (may include ground gas protection measures in buildings and selection of construction materials suitable for the ground conditions).

Further assessment will be undertaken in a DQRA.

5.5.2 The DQRA will include derivation of site specific assessment criteria (SSACs) based upon published UK exposure model parameters (chemical, physical and toxicology). Details of the ground conditions encountered during the ground investigation and details of the future development occupiers will also be used in the site-specific modelling. The SSACs will be derived using the Environment Agency Contaminated Land Exposure Assessment (CLEA) model version V1.071.

5.5.3 Exceedances from the GQRA will be compared to the SSACs for commercial and public open space land uses and any exceedances will be highlighted for remedial action prior to or during construction.

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5.5.4 For the assessment of Total Petroleum Hydrocarbons (TPH), concentrations will be reviewed and, if considered appropriate, the results of additivity of the individual TPH fractions assessed.

5.6 Ground gas assessment

5.6.1 Potential risks to human health include the potential presence of ground gas from landfill sites and other made ground sources on and adjacent to the land being considered for the DCO Project. Ground gas monitoring data will be used to assess the risks to human health within enclosed structures including buildings and tunnels. The assessment will be undertaken using the following guidance documents:

1. CIRIA C665 (2007) *Assessing risks posed by hazardous ground gases to buildings*
2. BS8576:2013 *Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)*
3. BS8485:2015 *Code of practice for the design of protective measures for methane and carbon dioxide ground gas for new buildings* and
4. CL:AIRE Research Bulletin (RB17), 2012, *A Pragmatic Approach to Ground Gas Risk Assessment*.

5.6.2 This assessment will include calculation of the characteristic gas situation for the area of the site where new buildings are proposed and an assessment of what level of protection is required in new buildings to be protective of future users.

5.6.3 It is considered unlikely that a quantitative gas risk assessment will be required. If, however, this is considered necessary based on the conceptual site models and testing results, the guidance set out in the *Ground Gas Handbook* (S Wilson, G Card and S Haines, published 2009) will be followed.

5.7 Asbestos

5.7.1 The objective of this methodology is to assess the long-term risk to human health in the completed DCO Project. In the completed DCO Project, any asbestos found in soil is likely to be covered by a runway, building or soft landscaping, thus eliminating the pathway.

5.7.2 It is noted that the industry guidance on risk assessment approach for asbestos is currently under review by SOBRA as part of the Joint Industry Working Group (JIWG) on asbestos and findings from this group may affect the final methodology adopted for the EIA. At present, however, the risk assessment for future use would

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be based around the approach taken in CIRIA C733 *Asbestos in soil and made ground: a guide to understanding and managing risks*. The risks would be subject to assessment using the Hodgson and Darnton model to assess the toxicological risk from exposure and use dust generation calculations and asbestos fibres release data from specific testing of samples taken from the affected materials to assess exposure. The assessment will consider exposure during construction.

5.7.3 The receptor characteristics (e.g. the exposure frequency and age and duration of exposure) would reflect assumptions made in the wider risk assessment on exposure to near surface soil.

5.7.4 Although asbestos in soil may present a risk during construction, this methodology is not intended to cover construction health and safety or acute risks to construction staff from land contamination, which will be addressed under CDM regulations.

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6. REUSE OF MATERIALS AND IMPORTED SOILS

6.1.1 As part of the DCO Project, excavated materials (such as Made Ground, landfill material, natural soils and river sediments) will be assessed for their re-use potential (for example as general earthworks fill, landscaping etc). The assessment will be undertaken with reference to the CL:AIRE Definition of Waste: Development Industry Code of Practice (DoW CoP).

6.1.2 In addition, soils may need to be imported to create landscaping and open space land uses.

6.1.3 Assessment criteria for the reuse of materials and acceptance criteria for the use of imported soils will be derived separately from the HHRA process outlined in Section 5 as part of theMMP. The requirements for the MMP will be detailed in the draft CoCP.

6.1.4 The acceptance criteria to be developed within the MMP will take into account:

1. The phytotoxic values of compounds such zinc, nickel and copper (which are markedly lower than S4ULs to be used in the HHRA) and
2. The requirements of Waste Acceptance Criteria (WAC) in line with the relevant guidance

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7. GLOSSARY

Term/Abbreviation	Description
BS	British Standard
C4SL	Category 4 Screening Levels
CSM	Conceptual Site Model
CDM	Construction Design Management
CIRIA	Construction Industry Research and Information Association
CoCP	Code of Construction Practice
CLEA	Contaminated Land Exposure Assessment
CLEA	Contaminated Land Exposure Assessment
CL:AIRE	Contaminated Land: Applications in Real Environments
CWRA	Controlled Waters Risk Assessment
DoW CoP	Definition of Waste: Code of Practice
DefraEFRA	Department for the Environment, Food and Rural Affairs
DQRA	Detailed Quantitative Risk Assessment
DWS	Drinking Water Standards
EIA	Environmental Impact Assessment
EQS	Environmental Quality Standards
EQSD	Environmental Quality Standards Directive
GACgwvap	GAC for the assessment of vapour risk arising from volatile contaminants in groundwater
GAC	Generic Assessment Criteria
GQRA	Generic Quantitative Risk Assessment
HHRA	Human Health Risk Assessment
JIWG	Joint Industry Working Group
LQM	Land Quality Management
MRV	Minimum Reporting Value
NPPF	National Planning Policy Framework
Part 2A	Part 2A of the Environmental Protection Act 1990
RTM	Remedial Targets Methodology
SSAC	Site Specific Assessment Criteria
SOBRA	Society of Brownfield Risk Assessment
SGV	Soil Guideline Values

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Term/Abbreviation	Description
SOM	Soil organic matter
S4UL	Suitable for Use Levels
TPH	Total Petroleum Hydrocarbons
VOC	Volatile Organic Compounds
WFD	Water Framework Directive

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8. BIBLIOGRAPHY

Creator	Title	Publisher and Place of Publication	Date of Publication
Agency, E., & Defra	Model Procedures for the Management of Land Contamination, Contaminated Land Report 11 (CLR-11)	CL:AIRE http://webarchive.nationalarchives.gov.uk/20140328160926/http://cdn.environment-agency.gov.uk/scho0804bibr-e-e.pdf	2003
British Standard	BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites.	British Standards Institute https://www.bsigroup.com/en-GB/	2011/2013
British Standard	BS5930:2015 Code of Practice for Ground Investigations	British Standards Institute https://www.bsigroup.com/en-GB/	2015
British Standard	BS8576:2013 Guidance on Investigations for Ground Gas, Permanent Gases and Volatile Organic Compounds	British Standards Institute https://www.bsigroup.com/en-GB/	2013
British Standard	BS8485:2015 Code of practice for the design of protective measures for methane and carbon dioxide ground gas for new buildings	British Standards Institute https://www.bsigroup.com/en-GB/	2015
CIRIA	C665 Assessing Risks posed by Hazardous Ground Gases to Buildings	CIRIA https://www.ciria.org/	2007
CIRIA	C733 Asbestos in Soil and Made Ground: a guide to understanding and managing risks	CIRIA https://www.ciria.org/	2014
CL:AIRE	Guidance on Comparing Soil Contamination Data with a Critical Concentration - Use of statistics guidance	CL:AIRE https://www.claire.co.uk/information-centre/cl-aire-publications	2008
CL:AIRE	Research Bulletin (RB17): A Pragmatic Approach to Ground Gas Risk Assessment	CL:AIRE https://www.claire.co.uk/information-centre/cl-aire-publications	2012
CL:AIRE	Definition of Waste: Development Industry Code of Practice	CL:AIRE https://www.claire.co.uk/projects-and-initiatives/dow-cop/28-framework-and-	2011

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Creator	Title	Publisher and Place of Publication	Date of Publication
		guidance/111-dow-cop-main-document	
Defra	Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance	The National Archives http://www.legislation.gov.uk/	2012
Defra	SP1010 Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination, Final Project Report Revision 2	CL:AIRE https://www.claire.co.uk/information-centre/cl-aire-publications	2014
Department for Communities and Local Government	National Planning Policy Framework	Department for Communities and Local Government https://www.gov.uk/government/publications/national-planning-policy-framework--2	2012
Environment Agency	Human Health Toxicological Assessment of Contaminants in Soil (SR2)	Environment Agency https://www.gov.uk/government/publications/human-health-toxicological-assessment-of-contaminants-in-soil	2009
Environment Agency	Updated Technical Background to the CLEA Model (SR3)	Environment Agency https://www.gov.uk/government/publications/updated-technical-background-to-the-clea-model	2009
Environment Agency	The Environment Agency's Approach to Groundwater Protection	Environment Agency https://www.gov.uk/government/publications/groundwater-protection-position-statements	2017
European Union	Council Directive 2000/60/EC establishing a framework for Community action in the field of water policy (Water Framework Directive)	European Commission http://ec.europa.eu/environment/water/water-framework/index_en.html	2000
European Union	Groundwater Daughter Directive (2006/118/EC)	European Commission http://ec.europa.eu/environment/water/water-framework/index_en.html	2006
HM Government	Part 2A Environmental Protection Act.	The National Archives http://www.legislation.gov.uk/	1990

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Creator	Title	Publisher and Place of Publication	Date of Publication
HM Government	Water Resources Act	The National Archives http://www.legislation.gov.uk/	1991
HM Government	The Environmental Damage (Prevention and Remediation) Regulations	The National Archives http://www.legislation.gov.uk/	2009
HM Government	Construction (Design and Management) Regulations	The National Archives http://www.legislation.gov.uk/	2015
HM Government	The Water Environment (Water Framework Directive) (England and Wales) Regulations	The National Archives http://www.legislation.gov.uk/	2017
Institution of Civil Engineers (ICE)	UK Specification for Ground Investigation, 2nd edition	ICE Publishing http://www.icebookshop.com/index.asp	2012
Nathanail, C. et. al.	The LQM/CIEH S4ULs for Human Health Risk Assessment	LQM http://www.lqm.co.uk/publications/	2015
SOBRA	Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater	SOBRA https://sobra.org.uk/resources/	2017
Wilson, S., Card, G., & Haines, S.	Ground Gas Handbook	CRC Press	2009

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creating a better place

Environment Agency

[redacted]
Wood PLC
Via email
[redacted]@Woodplc.com

Our ref: NE/2017/127936/01-L01
Your ref: HEP53-xx-RP-900-012965

Date: 16 January 2018

Dear [redacted]

ENV6001151R - Heathrow airport expansion project - Land Quality Risk Assessment; approach to human health and controlled waters risk assessment (HHRA and CWRA)

Documents reviewed:

Land Quality Risk Assessment Approach to Human Health and Controlled Waters Risk Assessment, document reference: HEP53-xx-RP-900-012965

Having reviewed the submitted document we are broadly in agreement with the proposed approach to the controlled waters risk assessment from a land quality perspective presented at this early and preliminary stage. We have the following comments to make:

Our comments are only in response to the controlled waters risk assessment aspect of the document as human health matters are not within the remit of the Environment Agency but are the responsibility of the relevant local authorities.

Section specific comments:

- 3.1.8. -The Construction Phase Environmental Management Plan (CEMP) should also include comprehensive details of the groundwater and surface water monitoring programme for prior (to establish baseline), during and after construction works

- Section 4.1.3 - the reason for the gravel aquifers in the Heathrow area being classified as a Principal Aquifer is due to their being used for public water supply.

- Section 4.1.4 - in addition to the identified receptor of surface watercourses, the gravel aquifer is itself a receptor and so are the public and private abstractions from the gravel aquifer.

- Section 4.4.2 - the Lower Thames Gravels WFD GwB is a Drinking Water Protected Area and therefore UK Drinking Water Standards should be the initial criteria for use in groundwater quality risk assessments and not surface EQS values.

Due to the potential scale and impact of development associated with the expansion it will be important that the DQRA is informed by the impacts of each phase of the expansion (pre-development, construction phase and developed). This is due to the fact

Cont/d..

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that the development has the potential to significantly alter the groundwater flow regimes in the area. These changes in the groundwater flow regime could potentially impact on receptors which would not necessarily be impacted based on the pre-development groundwater flow regime. It will therefore be important for the controlled waters risk assessment to be informed by the detailed groundwater modelling being carried out to inform the EIA and associated studies.

I hope that these comments are helpful. Please contact me if you have any queries.

Yours sincerely

[redacted]

Environment Agency

Telephone: Mobile [redacted]
E-mail: [redacted]@Environment-Agency.gov.uk
Address: Environment Agency, 2 Marsham Street, London, SW1P 4DF

End

[redacted]

From: [redacted] hounslow.gov.uk>
Sent:
To: [redacted]
Cc: [redacted] heathrow.com; [redacted].com
Subject: 5.3 Environmental Impact Assessment - Land Quality Risk Assessment Document Review Request

Dear [redacted]

Please find here comments from Hounslow Borough Council on the document "Risk Assessment, Approach to Human Health and Controlled Waters Risk Assessment" as requested in the HSPG work request LQ2A. Apologies for the delay in sending out our response but received the request later than it was sent out.

With regards to the 'site' it is unclear what the site covers will it be the whole site outlined in red as the report states that assessment of risks to groundwater at the edge of the expanded airport boundary only? With regards to Human Health assessment section 5.1.1 refers to a site wide desk study. If the site is to be reported as a whole it will be more onerous on regulators/ stakeholders to review all the site investigation and assessment data for the whole red line area when they may only be interested in distinct parts of the red line area. Is there any provision to break the site up regionally or by individual end use parcels. While it is useful to have a regional picture there may be areas of the site that need to be remediated first as they may have an effect on other parts of the site they may have an earlier build programme.

With regards to the GAC section of the report. This sets it out as S4ULs, C4SLs then historic GACs by CL:AIRE, AGS and EIC. Paragraph 5.2.3 refers to the Lead C4SL only which would take precedence under the hierarchy. It is not clear how an exceedance of a S4UL value but at a value less than the C4SL would be dealt with. We would request that further detail is provided on this. However our view is that the C4SL for Lead should only be used. A table showing contaminants of concern and the generic value to be used based on the land use would be considered useful. As well as AGS and EIC consideration should be given to Atkins or in-house derived values through appropriate use of modelling. This would be preferable to non UK standards. In addition no reference has been made to Phytotoxic contamination and some of these values can be lower than for human health.

Suitable detail should be provided on how both soil and water samples will be obtained referencing current guidance and legislation to ensure suitable samples are obtained and appropriate methods are used.

With regards to the SOBRA GACgwap consideration should be given to how it is used, specifically that it has not been derived to determine if remediation is necessary and caution that it will be sufficiently protective.

There is no reference to leachate testing. Will this be undertaken as part of the investigative works.

If gpm are required that these are validated in accordance with current guidance and standards

The document does not set out acceptance criteria for imported soils and cut & fill materials, which while being outside the scope of this document will be of interest to the same regulators/ stakeholders as we go through the environmental impact assessment process. Application of WAC testing will similarly be of interest with cut& fill operations.

If you require any additional information please let me know.

Kind regards

[redacted] **| Land Quality Manager**
Centre

London Borough of Hounslow
Office: [redacted]
Fax: [redacted]
Mob: [redacted]
www.hounslow.gov.uk

www.slough.gov.uk
Slough Borough Council

Taking pride in our communities and town

Date 2nd March 2018

Department: Environmental Quality
Contact Name: [redacted]
Contact No: [redacted]
Fax:
Email: [redacted] slough.gov.uk
Our Ref:
Your Ref: LQ2A

[redacted]
DCO Planning Manager
Heathrow Expansion Programme
Heathrow Airport
The Compass Centre, Nelson Road
Hounslow, Middlesex
TW6 2GW

Dear [redacted]

Re: Work Request LQ2A

I have reviewed the Land Quality Risk Assessment Report, and I have a few comments:

- **Section 3. Contaminated land risk assessment approach:**

  The proposed Conceptual Site Model (CSM) which *will be developed based on the future development of the Heathrow Expansion Project scheme*, should be developed for each site identified, as suggested in paragraph 3.1.6.

- **Section 4. Controlled waters risk assessment**

  This Section should be further reviewed by the EA, and advice should be sought regarding the proposed creation of new channels, and re-routing existing ones. Also, I believe that this phrase: *It is noted that the new water courses will in places also be channelised and therefore, in these locations, new linkages* ***will not*** *be created*, should read: ….*new linkages* ***will*** *be created*?

  Otherwise, the proposed Strategy to heal with Controlled water seems acceptable.

- **Section 5. Human Health Risk Assessment:**

  Paragraph 5.2.5. mentions that the site will most likely have 2-3 end uses, thus the likely exposure scenarios must be risk assessed separately. Otherwise, the proposed assessment and investigation are acceptable.

Yours sincerely,

[redacted]
Senior Scientific Officer

[redacted]

From: [redacted] spelthorne.gov.uk>
Sent: 19 January 2018 17:01
To: [redacted]
Cc: [redacted] heathrow.com'; [redacted] woodplc.com'
Subject: Work Request LQ2A: TO 5.3 E [redacted] act Assessment - Land Quality Risk Assessment Document Review Request

Dear [redacted]
Please find here comments from Spelthorne Borough Council on the document "Risk Assessment, Approach to Human Health and Controlled Waters Risk Assessment" as requested in the HSPG work request LQ2A.

- Paragraph 2.2.6. states that under Part 2A risks should only be considered in relation to the current use of the land – a minor point, but the Statutory Guidance (April 2012) for Part 2A defines "current use" quite broadly to include, for example, time to time temporary uses, reasonably likely future uses that would not require planning permission, and likely informal use of the land whether authorised or not. Given that the human health and controlled waters risk assessments are being prepared for the DCO process this is probably not an important distinction.
- Having reviewed the document I am not clear about "the site", what the outputs will be and the process for assessing those outputs – For groundwater there is reference to a global site model (section 4.3) and assessment of risks to groundwater at the site boundary, so presumably this refers to the site as the whole red line area, and so assessment of risks to groundwater at the edge of the expanded airport boundary only? Paragraph 5.1.1. refers to a site wide desk study for human health assessment. Will the human health and controlled waters risk assessments be reported for the whole red line area as one, or will the red line area be divided into individual use land parcels or areas (Geographical or local authority based), or disaggregated by proposed end use, and reported separately? I can see that there are benefits to assessing the regional picture, but obviously it will be more onerous on regulators/ stakeholders to review all the site investigation and assessment data for the whole red line area when they may only be interested in distinct parts of the red line area.
- Section 5.2 describes the hierarchy of GACs to be applied in human health assessment. This sets it out as S4ULs, C4SLs then historic GACs by CL:AIRE, AGS and EIC. Paragraph 5.2.3 refers to the Lead C4SL only – Lead being the only current published C4SL for which there is not a S4UL which would take precedence under the hierarchy, so the hierarchy is potentially slightly misleading. It is not clear how an exceedance of a S4UL value (but at a value less than the C4SL) e.g. for arsenic, benzene, benzo(a)pyrene, cadmium, or chromium VI, would be dealt with. Our view would be that clarification should be given that he exception for use of a C4SL over S4ULs shall only apply to lead. Under development control we would normally anticipate that a consultant would tabulate contaminants of concern stating the generic value to be used for the applicable land use scenario(s) and stating the source. This provides greater transparency and clarity on the hierarchy. As a principle, Spelthorne agrees that assessment criteria based on the principles of "minimal" or tolerable risk" should be preferred. There is no reference to other proprietary generic assessment values such as Atkins SSVs, and/ or the derivation of in-house criteria through appropriate use of the model methodology, which can provide values for some less common contaminants, and would be preferable to use of non-UK standards.
- Paragraph 5.3.1 refers to the use of SOBRA GACgwap for assessing vapour risks to human health from volatile contaminants in groundwater. It must be noted that the GACgwvap have not been derived to determine if remediation is necessary nor to be used as remediation targets, whereby a DQRA would be required. Within their report SOBRA also caution that in some instances the GACgwvap are not sufficiently protective, such that where the water concentration is lower than the GAC exposure could still exceed the HCV. Therefore the GACgwvap are not definitive and a full and proper Conceptual Site Model and good understanding of site specific conditions is imperative.
- There is no reference to any leachate testing or assessment there of – will this type of testing be done or will it only be soils and water testing?

- The document is of course related to assessment of contamination, but it is worth saying at this stage that if gas protection is appropriate that installation should be validated in accordance with CIRIA C735 (2014, Good practice on the testing and verification of protection systems for buildings against hazardous ground gases) in order to comply with the requirements of the BS8485: 2015.
- The document does not make any reference to phytotoxic contamination. Under development control we would expect a consultant's table of assessment criteria/ acceptance criteria to reflect the phytotoxic values of zinc, nickel and copper for landscaping and open space land use scenarios, as set out in BS 3882:2015 Specification for topsoil and BS8601: 2013 Specification for subsoil and requirements for use, which are markedly lower than the human health S4ULs.
- The document does not set out acceptance criteria for imported soils and cut & fill materials, which while being outside the scope of this document will be of interest to the same regulators/ stakeholders as we go through the environmental impact assessment process. Application of WAC testing will similarly be of interest with cut& fill operations.

Please do not hesitate to contact me if you have any queries with respect to these comments.

Kind regards,

[redacted]

Principal Pollution Control Officer

Spelthorne Borough Council,
Council Offices, Knowle Green, Staines-upon-Thames, TW18 1XB
Tel: [redacted]

[redacted]***working hours are Monday, Wednesday and Friday 08.00 – 17.30; and Tuesday and Thursday 08.00 – 14.30.*** *Outside of these hours, if your query is urgent, please telephone our support team on 01784 446 251. For non-urgent queries please re-direct your email to pollution.control@spelthorne.gov.uk.*

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Appendix 14.4
Minerals safeguarding policy context

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1. OVERVIEW OF POLICY CONTEXT

1.1.1 Minerals safeguarding and extraction is regulated principally under the Planning Regime, with control over operational matters divided between the Planning Regime, Environmental Permitting (which is regulated by the Environment Agency) and the Health and Safety Executive.

1.1.2 The planning policy framework which the applicant for the Development Consent Order (DCO) Project would have to comply with is set out in the revised draft Airports National Policy Statement (ANPS)[1]. This sets out the policies to be applied in determining any future application through the DCO process

1.1.3 The revised draft ANPS was published in October 2017, with the intention that the final ANPS will be designated by Parliament in the end of the first half of 2018.

1.1.4 Once designated, the ANPS will provide the principal planning policy to be applied in determining Heathrow's DCO application. The ANPS states:

1.12 The Airports NPS provides the primary basis for decision making on development consent applications for the Northwest Runway at Heathrow Airport, and will be an important and relevant consideration in respect of applications for new runway capacity and other airport infrastructure in London and the South east of England. Other NPSs may also be relevant to decisions on airport capacity in this geographical area.

1.1.5 The NPS policy requirements in relation to mineral safeguarding are underpinned by established national minerals safeguarding policies set out in the National Planning Policy Framework (NPPF), National Policy Statement for National Networks (NN NPS) and Planning Practice Guidance (PPG). Local Plans produced by Local Planning Authorities (LPAs) also contain policies for mineral safeguarding and mineral extraction. These documents are replaced by the NPS in respect of the DCO Project but remain as important material considerations which, *inter alia*, set out the detailed policy requirements in relation to mineral safeguarding.

1.1.6 The relevant points from these documents in relation to minerals safeguarding are set out in the following sections.

1.2 Airports National Policy Statement

1.2.1 Relevant sections of the revised draft ANPS are reproduced below:

[1] Department of Transport, Revised Draft Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England, October 2017

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5.115 The applicant should safeguard any mineral resources on the proposed site for the preferred scheme as far as possible.

5.119 Where the preferred scheme has an impact on a mineral safeguarding area, the Secretary of State must ensure that the applicant has put forward appropriate mitigation measures to safeguard mineral resources.

1.2.2 Other relevant linked policy extracts from the revised draft ANPS include:

5.79 Mitigation measures at the construction stage should also be provided and draw on best practice from other major construction schemes, including during the procurement of contractors. Specific measures could include but are not limited to [inter alia]:

- Selection of construction materials to utilise low carbon options; and

- Selection of construction material to minimise distance of transport.

5.227 The applicant has a range of mechanisms available to mitigate and minimise risks of land instability. These include [inter alia]:

- Requiring ground improvement techniques, usually involving the removal of poor material and its replacement with suitable inert and stable material. For development on land previously affected by mining activity, this may mean prior extraction of any remaining mineral resource.

1.3 National Planning Policy Framework

1.3.1 The National Planning Policy Framework (NPPF) outlines the requirement for mineral safeguarding and extraction through the planning system. The NPPF was published in 2012 and sets out the Government's planning policies for England and how these are expected to be applied.

1.3.2 Specifically related to minerals safeguarding, the NPPF states that:

13. Facilitating the sustainable use of minerals

142. Minerals are essential to support sustainable economic growth and our quality of life. It is therefore important that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs. However, since minerals are a finite natural resource, and can only be worked where they are found, it is important to make best use of them to secure their long-term conservation.

143. In preparing Local Plans, local planning authorities should:

- *define Minerals Safeguarding Areas and adopt appropriate policies in order that known locations of specific minerals resources of local and national importance are not needlessly sterilised by non-mineral development, whilst not creating a presumption that resources defined will be worked; and define Minerals Consultation Areas based on these Minerals Safeguarding Areas;*
- *safeguard:*

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- *existing, planned and potential rail heads, rail links to quarries, wharfage and associated storage, handling and processing facilities for the bulk transport by rail, sea or inland waterways of minerals, including recycled, secondary and marine-dredged materials; and*
- *existing, planned and potential sites for concrete batching, the manufacture of coated materials, other concrete products and the handling, processing and distribution of substitute, recycled and secondary aggregate material.*

- *set out policies to encourage the prior extraction of minerals, where practicable and environmentally feasible, if it is necessary for non-mineral development to take place;*

144. When determining planning applications, local planning authorities should, [inter alia]*:*

- *give great weight to the benefits of the mineral extraction, including to the economy;*
- *ensure, in granting planning permission for mineral development, that there are no unacceptable adverse impacts on the natural and historic environment, human health or aviation safety, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites in a locality;*
- *not normally permit other development proposals in mineral safeguarding areas where they might constrain potential future use for these purposes;*

145. Minerals planning authorities should plan for a steady and adequate supply of aggregates by:

- *preparing an annual Local Aggregate Assessment, either individually or jointly by agreement with another or other mineral planning authorities, based on a rolling average of 10 years sales data and other relevant local information, and an assessment of all supply options (including marine dredged, secondary and recycled sources);*
- *participating in the operation of an Aggregate Working Party and taking the advice of that Party into account when preparing their Local Aggregate Assessment;*
- *making provision for the land-won and other elements of their Local Aggregate Assessment in their mineral plans taking account of the advice of the Aggregate Working Parties and the National Aggregate Coordinating Group as appropriate. Such provision should take the form of specific sites, preferred areas and/or areas of search and locational criteria as appropriate taking account of published National and Sub National Guidelines on future provision which should be used as a guideline when planning for the future demand for and supply of aggregates;*
- *using landbanks of aggregate minerals reserves principally as an indicator of the security of aggregate minerals supply, and to indicate the additional provision that needs to be made for new aggregate extraction and alternative supplies in mineral plans;*
- *making provision for the maintenance of landbanks of at least 7 years for sand and gravel and at least 10 years for crushed rock, whilst ensuring that the capacity of operations to supply a wide range of materials is not compromised. Longer periods may be appropriate to take account of the need to supply a range of types of aggregates, locations of permitted reserves relative to markets, and productive capacity of permitted sites;*
- *ensuring that large landbanks bound up in very few sites do not stifle competition; and*
- *calculating and maintaining separate landbanks for any aggregate materials of a specific type or quality which have a distinct and separate market.*

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1.4 National Policy Statement for National Networks

1.4.1 The NN NPS outlines the requirement for mineral safeguarding and extraction as they relate to the delivery of nationally significant infrastructure (NSIP) projects on the national road and rail networks in England. The NN NPS was published in 2014 and sets out the Government's policies for England and how these are expected to be applied

1.4.2 Section 5 (Paragraph 169) of the NN NPS advises that "*Applicants should safeguard any mineral resources on the proposed site as far as possible*".

1.4.3 Section 5 (Paragraph 182) advises that "*Where a proposed development has an impact on a Mineral Safeguarding Area (MSA), the Secretary of State should ensure that the applicant has put forward appropriate mitigation measures to safeguard mineral resources*".

1.5 National Planning Practice Guidance

1.5.1 The National PPG, published alongside the NPPF, states:

What are mineral resources and why is planning permission required?

Mineral resources are defined as natural concentrations of minerals or, in the case of aggregates, bodies of rock that are, or may become, of potential economic interest due to their inherent properties. They make an essential contribution to the country's prosperity and quality of life. …

Planning for the supply of minerals has a number of special characteristics that are not present in other development:

- *minerals can only be worked (i.e. extracted) where they naturally occur, so location options for the economically viable and environmentally acceptable extraction of minerals may be limited. This means that it is necessary to consider protecting minerals from non-minerals development and has implications for the preparation of minerals plans and approving non-mineral development in defined mineral safeguarding areas;*
- *working is a temporary use of land, although it often takes place over a long period of time;*
- *working may have adverse and positive environmental effects, but some adverse effects can be effectively mitigated;*
- *since extraction of minerals is a continuous process of development, there is a requirement for routine monitoring, and if necessary, enforcement to secure compliance with conditions that are necessary to mitigate impacts of minerals working operations; and*
- *following working, land should be restored to make it suitable for beneficial after-use.*

The mineral planning authority is the county council (in 2-tier parts of the country), the unitary authority, or the national park authority. Minerals extraction may only take place if the operator has obtained both planning permission and any other permits and approvals. These

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include permits from bodies such as the Environment Agency, and licenses from Natural England and, in relation to coal resources, the Coal Authority.

Paragraph: 001 Reference ID: 27-001-20140306

Revision date: 06 03 2014

What steps should mineral planning authorities take to safeguard mineral resources?

Mineral planning authorities should adopt a systematic approach for safeguarding mineral resources, which:

- *uses the best available information. to define Mineral Safeguarding Areas [MSA];*
- *sets out Minerals Safeguarding Areas on the policies map that accompanies the local plan and*
- *define Minerals Consultation Areas [MCA]; and*
- *adopt clear development management policies which set out how proposals for non-minerals development in Minerals Safeguarding Areas will be handled, and what action applicants for development should take to address the risk of losing the ability to extract the resource. This may include policies that encourage the prior extraction of minerals, where practicable, if it is necessary for non-mineral development to take place in Minerals Safeguarding Areas and to prevent the unnecessary sterilisation of minerals.*

Detailed advice on mineral safeguarding may be found in the British Geological Survey Report Mineral safeguarding in England: good practice advice.

Paragraph: 003 Reference ID: 27-003-20140306

Revision date: 06 03 2014.

Is it appropriate to safeguard mineral resources in designated areas and urban areas?

Safeguarding mineral resources should be defined in designated areas and urban areas where necessary to do so. For example, safeguarding of minerals beneath large regeneration projects in brownfield land areas can enable suitable use of the mineral and stabilisation of any potentially unstable land before any non-minerals development takes place.

Paragraph: 004 Reference ID: 27-004-20140306

Revision date: 06 03 2014.

Why should planning authorities safeguard existing, planned and potential storage, handling and transport sites?

Planning authorities should safeguard existing, planned and potential storage, handling and transport sites to:

- *ensure that sites for these purposes are available should they be needed; and*
- *prevent sensitive or inappropriate development that would conflict with the use of sites identified for these purposes.*

In areas where there are county and district authorities, responsibility for safeguarding facilities and sites for the storage, handling and transport of minerals in local plans will rest largely with the district planning authority. Exceptions will be where such facilities and sites

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are located at quarries or aggregate wharves or rail terminals.

Planning authorities should consider the possibility of combining safeguarded sites for storage, handling and transport of minerals with those for processing and distribution of recycled and secondary aggregate. This will require close co-operation between planning authorities.

Paragraph: 006 Reference ID: 27-006-20140306

Revision date: 06 03 2014"

Planning Practice Guidance defines MSA and MCA as follows:

"Minerals Safeguarding Area – an area designated by a Mineral Planning Authority which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development."

"Minerals Consultation Area – a geographical area, based on a Mineral Safeguarding Area, where the district or borough council should consult the Mineral Planning Authority for any proposals for non-minerals development".

Paragraph: 221 Reference ID: 27-221-20140306

Revision date: 06 03 2014

"What is the role of the district council, as the local planning authority, in safeguarding minerals?

Whilst district councils are not mineral planning authorities, they have an important role in safeguarding minerals in 3 ways:

- *having regard to the local minerals plan when identifying suitable areas for non-mineral development in their local plans. District councils should show Mineral Safeguarding Areas on their policy maps;*
- *in those areas where a mineral planning authority has defined a Minerals Consultation Area, consulting the mineral planning authority and taking account of the local minerals plan before determining a planning application on any proposal for non-minerals development within it; and*
- *when determining planning applications, doing so in accordance with development policy on minerals safeguarding, and taking account of the views of the mineral planning authority on the risk of preventing minerals extraction.*

Paragraph: 005 Reference ID: 27-005-20140306

Revision date: 06 03 2014"

1.6 Guidance

1.6.1 The detailed advice on mineral safeguarding referenced in PPG paragraph 003 *British Geological Survey Report Mineral safeguarding in England: good practice advice* reinforces the guidance in PPG paragraph 004, stating that (*inter alia*):

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2.3 Safeguarding Mineral Resources

2.3.1 Mineral resources are finite and they must be protected to give future generations the best possible chance of meeting their own needs. Minerals can only be worked where they naturally occur and with increased pressure on land use we must ensure that those resources are not needlessly sterilised.

2.3.2 Sterilisation of mineral resources can occur as a result of surface development directly overlying the mineral resource, or by development that is situated on or close to the boundary of the resource. The marked differences in geological occurrences, properties, markets, and supply and demand for minerals, give rise to different land use planning implications and safeguarding considerations depending on the location"

2.3.3 There is no presumption that areas within a MSA will ultimately be allocated for extraction. If an application is submitted for mineral extraction within an MSA, the MSA designation itself does not provide any support for a grant of consent. If a MSA wishes to define future allocations for extraction then such areas must be identified as Areas of Search, Preferred Areas, and Specific Site allocations. Equally, there is no presumption that non-mineral development within a MSDA is automatically precluded. MSAs alert those proposing sites for future development to the presence of valuable mineral resources which they otherwise might not have considered. The MSAs indicate where local minerals safeguarding policies, formulated specifically to suit local circumstances may apply. The process should ensure that minerals are not necessarily sterilised whilst allowing competing development to proceed if the there is an overriding need for it. In those circumstances, extraction of the mineral ahead of the development (prior extraction) should always be considered.

A complete safeguarding process will:

- *identify mineral resources from the best available information*
- *define and adopt mineral safeguarding areas in development plans*
- *adopt suitable policies to ensure that minerals are not unnecessarily sterilised.*

4.2.10 In urban areas, MPAs should define MSAs to highlight the potential for extracting minerals (such as shallow coal, river terrace sand and gravel or Etruria Formation clays) beneath large regeneration projects and brownfield sites. Mineral development on such sites, particularly on the fringes of the urban areas, may be of economic advantage due to the availability of mineral on site for the development proposed, or the shorter distance to market if sold

1.6.2 Other guidance recognises the likely limitations of scale of prior extraction of minerals where development or redevelopment are involved, in particular *Guidance Note on Mineral Safeguarding Process for Aggregates – Sand and Gravel and Carstone*; Norfolk County Council, November 2014, which states that:

"Whatever form the prior extraction takes, it is recognised that some scales of prior extraction may be incompatible with the proposed development, this would need to be determined on a site by site basis. However, it is considered likely that some form of prior extraction would be feasible on most sites where viable mineral is proved."

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1.7 Local development plan policy

1.7.1 In accordance with the requirements set out in the national policies, the LPAs have each addressed the issue of Mineral Safeguarding in their existing and emerging Development Plans.

1.7.2 The mineral extraction and mineral safeguarding policies of the following LPAs are likely to be relevant because the DCO Project sits within or close to these LPA areas:

1. **London Boroughs**
   a. London Borough of Hillingdon
   b. London Borough of Haringey.
2. **Two Tier Authority Areas** (where the County Council is the Mineral Planning Authority):
   a. Surrey:
      - Surrey County Council
      - Spelthorne Borough Council
      - Runnymede Borough Council.
   b. Buckinghamshire:
      - Buckinghamshire County Council
      - South Bucks District Council.
3. Unitary Authorities:
   a. Windsor and Maidenhead Council
   b. Slough Borough Council.

1.7.3 The London Boroughs (Hillingdon and Haringey) and the Berkshire Unitary Authorities (Slough and Windsor and Maidenhead) together with Surrey County Council and Buckinghamshire County Council are all MPAs in their own right.

1.7.4 In summary, the LPAs have:

1. Designated specific sites in their Plans for future mineral working. These are variously described as “preferred sites” or “preferred areas” and occasionally “safeguarded sites”. The policies confer an in-principle presumption in favour of the site being extracted for sand and gravel. These sites take on a particular importance because they are needed to replenish the permitted minerals reserves which make up the MPAs individual and collective contributions to

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maintaining a landbank of permitted mineral reserves; which is a key mechanism for maintaining a steady and adequate supply of aggregate minerals.

2. Designated as safeguarded, individual sites or whole areas of known mineral reserves for future mineral working, but with no presumption that proposals for mineral extraction will be acceptable.

1.7.5 In addition to Development Plan policies, MPAs are required by the NPPF to produce (individually or jointly) an annual Local Aggregates Assessment (LAA). The LAA is intended to outline the sources of supply and demand for aggregates within the MPA area and make an assessment as to whether there is a shortage or surplus of supply, and how any shortages will be addressed.

1.7.6 The NPPF also requires MPAs to participate in Aggregate Working Parties (AWP) in order to maintain a steady and adequate supply of aggregates. The AWPs are responsible for preparing Aggregate Monitoring reports. The information and advice in these reports is essential for the preparation of LAAs.

1.7.7 The AWPs relevant for the proposed development are the South-East Region and London AWPs.

1.7.8 The MPAs and AWPs will also be important consultees on the proposed approach to Minerals Safeguarding and Extraction during the scoping phase of the DCO application process.

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Appendix 14.5
Minerals safeguarding assessment approach

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1. OVERVIEW

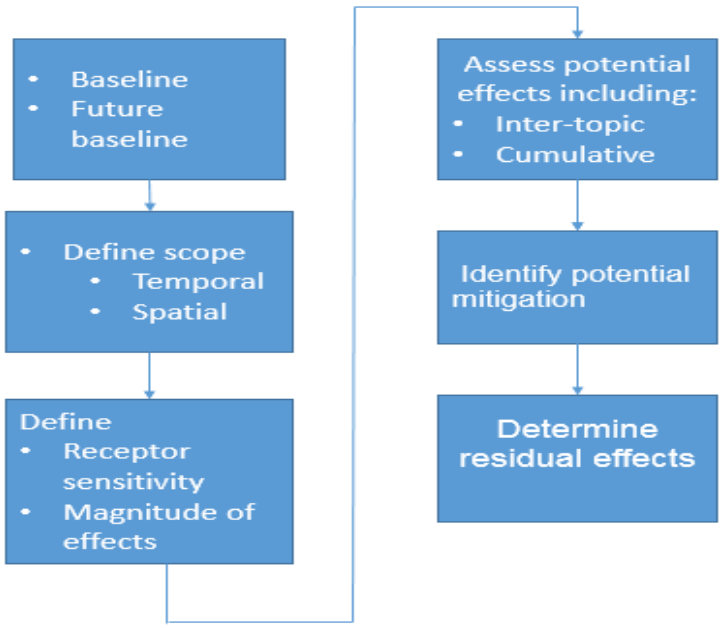
1.1 Assessment of effects on mineral safeguarding

1.1.1 The following provides a methodology for the assessment of effects on safeguarded mineral resources.

1.1.2 There is no established methodology for assessing the environmental effects of a development on mineral safeguarding. The proposed methodology detailed in this appendix has therefore been developed based on the guidance detailed in **Appendix 14.4: Minerals Safeguarding Policy Context** and professional judgement.

1.1.3 A flowchart summarising the proposed methodology presented as Graphic 14.5.1.

Graphic 14.5.1 Mineral resources Environmental Impact Assessment (EIA) methodology approach flowchart



1.1.4 The approach seeks to identify the ways in which the DCO Project could impact on the existing mineral resources in terms of safeguarded mineral resources and sterilisation of unworked mineral resources.

1.2 Receptors and minerals sterilisation

1.2.1 The key receptor for the minerals assessment is the unworked mineral resources themselves.

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1.2.2 Sterilisation of mineral resources is the loss of access to those resources as a consequence of non-mineral development. When permanent development is constructed over mineral resources, those resources directly underneath (and also areas potentially beyond the development) will become unavailable for current and future generations to extract the mineral.

1.2.3 As construction also consumes aggregate minerals (for example in concrete production), the sterilisation of a mineral resource also results in other sites and areas being extracted instead, thereby depleting the finite resources in those areas and 'passing on' the environmental effects of mineral extraction to another site or area.

1.2.4 Mineral sterilisation is therefore likely to occur when existing sand and gravel reserves are:

1. Built over for the first time i.e. greenfield sites
2. Below areas that are proposed for redevelopment and are rendered inaccessible again by new development or,
3. Subject to new constraints which may prevent them from being worked, including:
    a. New non-mineral development which introduces constraints on the extraction of mineral reserves on both the development site and on mineral resources nearby due to the need to protect new land uses and sensitive receptors
    b. The change of use of undeveloped sites to uses that may not be compatible with mineral extraction, for example, sites earmarked for public open space or biodiversity.

1.2.5 On this basis, areas of land within the study area can be divided into three main receptor categories:

1. Undisturbed greenfield sites with underlying mineral resources
2. Sites already subject to current and / or previous mineral workings but with remaining unworked reserves of sand and gravel
3. Sites already developed with permanent buildings/infrastructure, but which will be displaced (and therefore demolished) as part of the DCO Project, thus potentially exposing unworked reserves of sand and gravel.

1.2.6 Within each receptor category, there may be a number of distinguishable receptor types which include:

1. Existing extraction sites (operational or dormant but which could be restarted)

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2. Existing sites (operational or dormant) with planning permission for extensions to the existing or former operations
3. Sites with existing planning permission for new extraction
4. Sites designated as preferred sites for mineral extraction in Local Planning Authority (LPA) local plans
5. Sites designated as safeguarded sites and areas in LPA local plans
6. Safeguarded mineral resources on undesignated sites.

1.3 Characterising potential effects

1.3.1 This section will describe the characteristics of the potential effects of the DCO Project on minerals resources.

1.3.2 The sensitivity and magnitude of the effects will each be categorised as High, Medium, Low or Negligible, with the significance of the combined sensitivity and magnitude categorised as Major, Moderate, Minor or Negligible.

1.3.3 Whilst demolition work is beyond the general scope of the minerals safeguarding topic, it is important to note that the periodic removal and replacement of buildings and infrastructure takes place on many sites with varying lengths of time between demolition and redevelopment.

1.3.4 Each time this happens it theoretically creates conditions where some minerals that may be sterilised by the current development become available for extraction prior to redevelopment proceeding. These conditions have been incorporated into the potential effects.

1.3.5 The potential sensitivity of the mineral resources will be assigned using Table 14.5.1.

Table 14.5.1 Evaluation of receptor sensitivity

Mineral resource present	Resource Sensitivity	Planning designation	Planning Sensitivity	Overall Receptor Sensitivity
Nationally important aggregate or industrial mineral sparsely distributed and with limited regional and local reserves	High	Active or mothballed quarry with substantial remaining reserves	High	High
Nationally important aggregate or industrial mineral, widely distributed but with limited regional and local reserves	Medium	Site allocated in a Local Plan for sand and gravel extraction and with	High	High

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Mineral resource present	Resource Sensitivity	Planning designation	Planning Sensitivity	Overall Receptor Sensitivity
		substantial reserves		
Nationally important aggregate or industrial mineral, widely distributed but with limited regional and local reserves	Medium	Areas with substantial reserves and subject to a safeguarding designation or policy presumption	High	Medium
Nationally important aggregate or industrial mineral, widely distributed and with substantial regional and local reserves	Low	Areas with limited reserves and subject to a safeguarding designation or policy presumption	Low	Low
Nationally important aggregate or industrial mineral, widely distributed and with limited regional and local reserves	Medium	Areas with limited reserves and subject to a safeguarding designation or policy presumption	Low	Low
Nationally important aggregate or industrial mineral, widely distributed and with limited regional and local reserves	Medium	Areas with negligible reserves subject to safeguarding designation or policy presumption	Negligible	Negligible
Nationally important aggregate or industrial mineral, widely distributed and with limited regional and local reserves	Medium	Green field areas with substantial reserves subject to general safeguarding policy	Medium	Medium
Nationally important aggregate or industrial mineral, widely distributed and with substantial regional and local reserves	Low	Redevelopment areas with substantial reserves subject to general safeguarding policy	Medium	Low
Nationally important aggregate or industrial mineral, widely distributed and with limited regional and local reserves	Medium	Redevelopment areas with substantial reserves subject to	Medium	Medium

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Mineral resource present	Resource Sensitivity	Planning designation	Planning Sensitivity	Overall Receptor Sensitivity
		general safeguarding policy		
Important non-aggregate mineral widely distributed and with accessible regional and local reserves	Low	The Project's development sites	Low	Low

Note: Substantial reserves is defined as over 100,000 tpa workable reserves. Limited reserves is defined as less than 100,000tpa workable reserves.

1.3.6 In Table 14.5.1, the sensitivity of a particular deposit is determined by a combination of the importance ascribed to the particular type of mineral and also the importance ascribed to the specific reserves in the minerals policies and site allocations of the relevant Local Plan, on the following basis:

1. Sand and gravel is an aggregate mineral of national importance. Government's policy priority is to ensure a steady and adequate supply of aggregate minerals
2. Current supplies of sand and gravel come from a combination of land based quarries and marine dredged sources
3. Land based sand and gravel deposits are spread widely but unevenly across the UK. In south-east England reserves are significantly constrained due to the extent of previous working. The area around Heathrow has historically been extensively worked for sand and gravel
4. Minerals can only be worked where they naturally occur and any one mineral site will have a finite quantity of extractable minerals. As the mineral in each planning permission is progressively extracted, the remaining 'landbank' of permitted mineral reserves is also being depleted
5. Mineral Planning Authorities (MPAs) are required to ensure that an adequate landbank of land won sand and gravel planning permissions is maintained. (This also applies to other aggregate minerals as well including 'crushed rock'). They do this by periodically reviewing the minerals policies in their Local Plan which enables them to designate new minerals sites or extensions to existing. They also monitor sales of minerals and the extent of mineral reserves with planning permission and grant planning permission for additional reserves when there is a demonstrable need
6. MPAs are also required to designate areas with known mineral reserves as 'Minerals Safeguarding Areas' but with no necessary presumption that the mineral will be worked. These areas are also designated as 'Minerals Consultation Areas'. This ensures that proposals for non-mineral development

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in these areas (which would have the effect of sterilising the mineral by preventing its extraction in the future) are the subject of a consultation process with the MPA; and there is a requirement to assess the feasibility of prior extraction before any grant of planning permission for the development.

1.3.7 The potential magnitude of the effect will be assessed using the criteria in Table 14.5.2 which reflects the viability of the mineral resources present and the extent to which these are sterilised as a consequence of the DCO Project.

Table 14.5.2 Evaluation of magnitude of effects

Magnitude	Criteria
High	Development permanently prevents viable exploitation of a resource. Development causes a significant loss of a resource that cannot be accommodated by alternative sites at a local or regional level. Development directly and adversely affects the operation of an ongoing mineral extraction site, to the extent that its viability is clearly and demonstrably reduced.
Medium	Development has permanent effects that will sterilise a significant proportion of a mineral deposit (excluding those under ongoing extraction). Development has temporary effects that sterilise a significant proportion of a mineral deposit (excluding those under ongoing extraction), but which would be expected to be reversed in the short to medium term.
Low	Development permanently affects a minor proportion of a mineral deposit, to an extent that is unlikely to significantly affect its overall viability or quality. Development has temporary effects that sterilise minor parts of a mineral deposit (excluding those under ongoing extraction), which would be expected to be reversed in the short to medium term.
Negligible	Development has no permanent or temporary effects on mineral deposits that would affect the ability to extract the deposits, their viability or their quality.

1.4 Evaluation of significance of effects

The significance of the effects on mineral resources will be determined by combining the receptor sensitivity and the magnitude of the effects using the matrix presented in

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1.4.1 Table 14.5.3.

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Table 14.5.3 Determination of Significant Effects on Mineral Resources

	Magnitude of Effects			
Sensitivity of Receptor	**High**	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

1.4.2 It is proposed that effects assessed as major will be considered to be significant for the purposes of the EIA.

1.4.3 Effects assessed as moderate or minor would not, however, be disregarded. Whilst not significant for EIA purposes, measures to reduce such effects may be incorporated as 'additional' or 'best practice' mitigation within the draft Code of Construction Practice (CoCP).

1.4.4 The draft CoCP will incorporate the requirements for a Materials Management Plan (MMP) to be developed which will seek to maximise the reuse of clean mineral resources excavated as part of the DCO Project.

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Appendix 15.1
Definitions

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1. DEFINITIONS

1.1.1 Given that the topic of major accidents and disasters is new to Environmental Impact Assessment (EIA), it is important that concepts and the context of terms used in the assessment are agreed and understood. The following definitions are referenced throughout **Chapter 15: Major accidents and disasters**.

1.1.2 Note 1: These definitions have been developed for use in documents relating to major accidents and disasters topic, only. Alternative definitions of these phrases may be applied in documents prepared in other topic chapters within the EIA. This is due to differences in the nature and focus of each topic considered.

1.1.3 **Major accident** – An occurrence resulting from an uncontrolled event caused by a man-made activity or asset leading to serious damage on receptors, either immediate or delayed.

1.1.4 Note 1: This either arises from (directly or indirectly), or has potential to impact upon the DCO Project under assessment. This includes the third runway and associated activities and features, during both construction and operation.

1.1.5 Note 2: Major accidents include both those sourced at the DCO Project under assessment and those sourced externally but interacting with it.

1.1.6 Examples: A major accident at a third-party establishment which gives rise to significant injury at the airport; aircraft crash; fire in terminal or discharge of contaminated firewater or de-icer.

1.1.7 **Disasters** – A natural occurrence leading to serious damage on receptors, either immediate or delayed.

1.1.8 Note 1: The 2014/52/EU Directive Para 14 refers to man-made disasters and the European Commission document *A Community Approach on the Prevention of Natural and Man-made Disasters (February 2009)*. The remainder of the Directive refers only to disasters or natural disasters. Our interpretation is that the concept of man-made disasters is therefore included in the definition of 'major accidents' in the 2014/52/EU Directive.

1.1.9 Note 2: This either arises from (directly or indirectly), or has potential to impact upon the development.

1.1.10 Examples: Hurricane, landslide, extreme seismic activity.

1.1.11 **Vulnerability** – The United Nations Office of Disaster Risk Management (UNISDR) definition of vulnerability[146] is '*The conditions determined by physical,*

[146] United Nations Office of Disaster Risk Management www.unisdr.org/we/inform/terminology (accessed 17 January 2018)

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social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards'. This is applied in this assessment as the reduced ability of the development to plan, control, resist and recover from a major accident or disaster in a timely manner.

1.1.12 Note 1: The major accidents and disasters assessment will include consideration of relevant environmental features and effects from major accidents and disasters associated with the development and adding to its vulnerability, not only those of the development itself.

1.1.13 **Receptors** – Population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape. These are as defined in Regulation 5(2) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and include people.

1.1.14 Note 1: The definition of receptors includes those which are part of the development, as well as those in the surrounding area.

1.1.15 **Serious damage to human populations** – This includes harm which would be considered substantial i.e. death(s), multiple serious injuries or a substantial number requiring medical attention.

1.1.16 **Serious damage on the environment** – Loss or significant detriment to populations of species or organisms, valued sites (including designated sites), valued cultural heritage sites, contamination of drinking water supplies, ground or groundwater, or harm to environmental receptors in line with other UK Major Accident regulations[147].

1.1.17 **Significant effect** – A significant effect is an increased risk of major accidents and disasters to a receptor leading to a total risk level that would be considered intolerable to general society and cannot be justified on any grounds. Further guidance on how intolerable is measured is provided in R2P2[148] and 'All Measures Necessary'[149].

~~1.1.18~~ Note 1: Direction provided by the European Commission (2017) highlights that the context for inclusion of major accidents and disasters is to ensure that adequate focus is given to the provisions for events leading to significant risk with an objective of building resilience in a development against such effects.

1.1.19 Note 2: At scoping stage all potential significant effects are considered. Risk reduction measures to prevent, control, recover from and reduce the impact of

[147] Control of Major Accident Hazards (COMAH) Regulations 2015
[148] Health and Safety Executive, Reducing Risk Protecting People (R2P2), 2001
[149] Health and Safety Executive, Environment Agency, Scottish Environmental Protection Agency, Natural Resources Wales, Office for Nuclear Regulation, All Measures Necessary – Environmental Aspects Guidance to the Competent Authority Inspectors and Officers, April 2016

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major accidents and disasters form a key part of the assessment and will help to identify those which are likely significant effects.

1.1.20 **Likely significant effect** – A significant effect which following assessment is confirmed to be present as a result of the development and remain even after risk reduction measures have been applied.

1.1.21 **Pathway** – The physical route or medium by which a hazard source reaches and effects a receptor.

1.1.22 **Risk** – The likelihood of an event occurring and resulting in a given consequence.

1.1.23 **Intolerable** – Intolerable denotes a level of risk to individuals, groups of individuals (societal risk) or the environment that would be considered to be unacceptable. In the HSE document R2P2[148], intolerable and unacceptable are used interchangeably. HSE state that *'a particular risk falling into that* [unacceptable/intolerable] *region is regarded as unacceptable whatever the level of benefits associated with the activity. Any activity or practice giving rise to risks falling in that region would, as a matter of principle, be ruled out unless the activity or practice can be modified to reduce the degree of risk'*

1.1.24 **Tolerable** – Tolerable risk denotes a level of risk to individuals, groups of individuals (societal risk) or the environment that society *'is willing to live with a risk so as to secure certain benefits in the confidence that the risk is one that is worth taking and that it is being properly controlled'*. However, there are several constraints, HSE[148] state that in return for tolerating that risk, society can expect from the development that:

1. The nature and level of the risks are properly assessed and the results used properly to determine control measures
2. The residual risks are not unduly high and kept as low as reasonably practicable (the ALARP principle)
3. The risks are periodically reviewed to ensure that they still meet the ALARP criteria.

1.1.25 **Broadly acceptable** – Broadly acceptable risk denotes a level of risk to individuals, groups of individuals (societal risk) or the environment that according to HSE[148] is '*generally regarded as insignificant and adequately controlled*'. This level of risk is generally considered extremely low in comparison to background risk and so can be easily accepted by society. HSE state that *'the levels of risk characterising this region are comparable to those that people regard as insignificant or trivial in their daily lives.*'

1.1.26 **Reasonably foreseeable** – A reasonably foreseeable major accident or disaster is one that could credibly be expected to occur as part of the development as a

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result of events and behaviour associated with that development. HSE state in R2P2148 that *'the risk of a well-designed, properly built and well maintained building collapsing would not be regarded as a reasonably foreseeable event (unless signs such as subsidence, cracked walls or falling roof tiles suggest otherwise).*'

1.1.27 **ALARP** – As Low As Reasonably Practicable (ALARP) refers to a state where the level of risk for a potential major accident or disaster falling within the tolerable band (defined in 1.1.24) is at a level where the sacrifice required to further reduce the level of risk is 'grossly disproportionate' to the benefit gained in terms of risk reduction.

1.1.28 Note 1: While ALARP is used in this document, it should be noted that So Far Is As Reasonably Practicable (SFAIRP) is used in some legislation. HSE state that '*In HSE's view, the two terms are interchangeable except if you are drafting formal legal documents when you must use the correct legal phrase.*' [150]

[150] HSE, ALARP at a glance http://www.hse.gov.uk/risk/theory/alarpglance.htm (accessed on 27/04/18]

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Appendix 15.2
Relevant legislation, national and local planning policies

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1. LEGISLATION, NATIONAL AND LOCAL PLANNING POLICIES

1.1.1 Policy and legislation relevant to the major accidents and disasters assessment methodology is detailed in Section 15.2 of the Scoping Report.

1.1.2 Additional information concerning other legislation and guidance relevant to the major accidents and disasters assessment methodology is provided in Table 15.2.1.

Table 15.2.1 Additional legislation and guidance relevant to the major accidents and disasters assessment methodology

Legislation or policy reference	Legislation summary or policy information relevant to major accidents and disasters
Legislation	
Infrastructure Planning (Environmental Impact Assessment) Regulations 2017	These Regulations provide the legislative requirements for Environmental Impact Assessment (EIA) of Nationally Significant Infrastructure Projects in England and Wales, including the new requirement to consider Major Accidents and Disasters. Implement the requirements of the EIA Directive.
2014/52/EU Directive on the Assessment of the Effects of Certain Public and Private Projects on the environment	The EIA Directive is the principal instrument of EU legislation which establishes the framework for the environmental assessment of public and private projects. The revised 2014 EIA Directive has been written with reference to 'A Community Approach on the Prevention of Natural and Man-made Disasters', 2009 (paragraph 14 of the directive), and now includes an express requirement for major accidents and disasters to be considered as part of the EIA process.
Health and Safety at Work Act 1974	The primary legislative instrument covering workplace health and safety in Great Britain. The Act establishes various obligations to ensure, so far as is reasonably practicable, that persons are not exposed to risks to their health and safety. The Health and Safety Executive, along with local authorities, are responsible for enforcing the Act. Many Regulations made under the Act[146] are applicable to the DCO Project for the obligations they place on employers to assess risks and to implement controls. Associated Approved Codes of Practice and Guidance describe how the Regulations can be met. These will be used in the assessment to determine the significance of the

[146] The Health and Safety at Work Act is an enabling Act under which almost all other Health and Safety regulations are made.

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Legislation or policy reference	Legislation summary or policy information relevant to major accidents and disasters
	effect and to identify embedded mitigation arising from adherence to standards and practice.
Management of Health and Safety at Work Regulations 1999	These Regulations include a specific requirement that employers make a suitable and sufficient assessment of the risks to the health and safety of employees and persons, including an obligation to establish appropriate procedures to be followed in the event of serious and imminent danger to persons at work in an undertaking.
Control of Major Accident Hazards Regulations 2015 (COMAH)	COMAH is designed to control major accident hazards involving dangerous substances and to limit the consequences to people and the environment of any accidents which do occur. COMAH applies to establishments under its remit which have any dangerous substance(s) specified in COMAH in an aggregate quantity at or above a qualifying threshold. For those sites to which COMAH applies, specific obligations exist to support the management of major accidents and disasters (environmental and safety risk). A level of demonstration is also required which is proportionate to the level of risk posed by the establishment, and the quantity of dangerous substances involved. Standards and guidance issued in support of COMAH have been referenced in developing the methodology for scoping and assessment, including for identifying potential major accidents and disasters and setting the thresholds and criteria for assessing the significance of effects on the environment. The Seveso III Directive is implemented in Great Britain through COMAH Regulations 2015 and through planning legislation[147]. COMAH is enforced by the COMAH Competent Authority. In England, this comprises the Health and Safety Executive (other than for specific industries such as the nuclear industry) and the Environment Agency.
Pipeline Safety Regulations 1996	These Regulations are to ensure that pipelines are designed and operated safely. Additional requirements concerning emergency response planning and notification to regulatory bodies apply to pipelines conveying high hazard fluids (defined in the schedule to the Regulations).
Planning (Hazardous Substances) Regulations 2015	These Regulations require sites that want to hold inventories of hazardous substances at or above a defined threshold must obtain a hazardous substances consent.

[147] For example Planning (Hazardous Substances) Regulations 2015

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Legislation or policy reference	Legislation summary or policy information relevant to major accidents and disasters
Construction (Design and Management) Regulations 2015	These Regulations apply to all construction projects, from concept to completion. Places duties on designers, construction contractors and clients, to ensure that projects are carried out safely, and in a manner that secures the health and safety of any person affected by the project. The principal designer must identify and eliminate or control, so far as is reasonably practicable, foreseeable risks to people carrying out construction work or who may be affected by construction work, and to personnel involved in the upkeep of the structure. The risks from construction activities, including demolition must be mitigated by measures determined by a construction risk assessment and good working practices. Construction (Design and Management) includes specific requirements on site security, stability of structures, demolition and dismantling, explosives, excavations, cofferdams and caissons, energy distribution installations, prevention of drowning, traffic routes, vehicles, prevention of risk from fire, flooding or asphyxiation, emergency procedures, escape routes, fire detection and fire-fighting, temperature and weather protection, and welfare requirements.
Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)	LOLER are designed to ensure that risk is managed properly with regards to lifting operations, including through addressing the act of lifting cargoes, and the equipment used to perform the lifting. For complex lifts, a written plan, addressing foreseeable risks and prepared by competent person(s) is required. Lifting equipment must be suitable or the lift checked regularly.
Control of Asbestos Regulations 2012	These Regulations are designed to ensure that risk is properly managed with regards to dealing with asbestos and asbestos-containing materials. It details the requirements of duty holders to use control measures, assessment of work, and prevention and reduction measures to manage the risk and minimise exposure to asbestos.
Control of Substances Hazardous to Health Regulations 2002 (COSHH)	Employers have a duty to control substances that are hazardous to health, and to assess and manage the risk to health created by work involving such substances. The scope includes biological agents such as legionella.
The Regulatory Reform (Fire Safety) Order 2005 (FSO)	Outlines requirements to take reasonable steps to reduce the risk from fire and make sure people can safely escape if a fire occurs. This includes the requirement to carry out fire-risk assessment identifying possible dangers, and to take measures to make sure there is protection if flammable or explosive materials are used or stored. Scope includes construction. FSO does not apply to aircraft.

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Legislation or policy reference	Legislation summary or policy information relevant to major accidents and disasters
The Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005	These Regulations, as well as the Civil Contingencies Act 2004 under which the Regulations are made, set out what needs to be done to prepare for major accident / disaster at local level. Local authorities and primary responders such as the emergency services are required to have plans in place to respond to foreseeable emergencies. Heathrow Airport is designated a 'co-operating body' and as such works with the local authority and emergency services to plan for incidents that could affect the airport.
The Building Regulations 2010	These Regulations ensure that building work is controlled and complies with applicable requirements given in Schedule 1 of the Regulations. The Building Regulations 2010 are supplemented by a collection of Approved Documents which provide guidance on ways to meet the requirements of the Regulations. These include Approved Document A covering loading on a building, and the construction of the structural elements, and Approved Document B for fire safety including means of warning and escape; internal and external fire spread, and access and facilities for Fire and Rescue services. Note that in response to the fire that occurred at Grenfell, June 2017, the government ordered an independent review of Building Regulations and Fire Safety. The interim report[148] indicates that the current regulatory regime for ensuring fire safety in high-rise and complex buildings is 'not fit for purpose'. The focus of the review is on 'high-rise' and complex buildings, and it is likely that recommendations will be wider reaching and relevant to components of the development.
CAP 168: Licensing of Aerodromes, March 2014	Broad guidance document to support discretionary powers relating to the granting of an aerodrome licence contained in the Air Navigation Order (ANO). The scope includes guidance on design (for example runway surface, lighting etc.) risks for example. bird strike and requirements for emergency preparedness, including specifically to provide a Rescue and Fire-Fighting Service.
CAP 670: ATS Safety Requirements, May 2014	Sets out the safety regulatory framework and requirements associated with the provision of an air traffic service, and sets out requirements for a number of aspects such as Navigation, Communication, and Air Traffic Control.
CAP 760: Guidance on the Conduct of Hazard Identification, Risk Assessment and the	This initial guidance for Air Traffic Service Providers and Aerodrome Operators provides information on Hazard Identification, Risk Assessment and Developing Safety Cases. It outlines the structured and systematic Seven-Step risk assessment and mitigation process.

[148] Building a Safer Future – Independent Review of Building Regulations and Fire Safety: Interim Report https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/668832/Independent_Review_of_Building_Regulations_and_Fire_Safety_-_summary_accessible.pdf (accessed 16 February 2018)

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Legislation or policy reference	Legislation summary or policy information relevant to major accidents and disasters
Production of Safety Cases, December 2010	
CAP 795: Safety Management Systems - Guidance to Organisations, February 2015	This document provides guidance on the implementation of Safety Management Systems (SMS). It reflects and meets the requirements of ICAO Annex 19 and EASA Management System Implementing Rules.
CAP 1223: Framework for an Aviation Security, March 2018	The document outlines a framework for implementing a Security Management System (SeMS) which provides a formalised, risk-driven framework for integrating security into the daily operations and culture of an airport operator. SeMS is not a mandated process but if an airport operator has a SeMS which contains all the elements which are identified in this framework, it will help the airport operator meet the internal quality control provisions of articles 12, 13 and 14 of EC 300/2008.
CAP 1273: Implementing a Security Management System: An Outline, March 2018	Summarises and explains key aspects of the SeMS Framework (CAP 1223) and outlines the approach the Civil Aviation Authority (CAA) is taking to the support of SeMS implementation by the industry.
CAP 1616: Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements, December 2017	Describes the regulatory process for permanent and temporary changes to airspace. Requires the sponsor to prepare a safety assessment of any proposed changes at 'Options Appraisal'. The safety assessment is developed in increasing detail as the proposed changes progress through the process.
Regulation (EC) No 300/2008 Common rules in the field of civil aviation security	Lays down common rules and basic standards on aviation security and on procedures to monitor their implementation. It applies to all civil airports in the EU, as well as to air carriers and entities providing goods or services to or through these airports.
Policy	
Revised draft Airports National Policy Statement (ANPS)	The revised draft ANPS provides the primary basis for decision-making on development consent applications for a Northwest Runway at Heathrow Airport, and will be an important and relevant consideration in respect of applications for new runway capacity and other airport infrastructure in London and the South East of England. The revised draft ANPS covers a number of issues which have the potential to influence the cause, severity or likelihood of Major Accidents and Disasters (for example Climate Change, flood risk). The revised draft ANPS (paragraph 4.43) states that where there are safety critical elements of the design with a design life of 60 years or greater the applicant should apply the latest UK Climate

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Legislation or policy reference	Legislation summary or policy information relevant to major accidents and disasters
	Projections for 2080 against the 10, 50 and 90% probability levels so as to include high impact, low likelihood scenarios. The revised draft ANPS (paragraph 4.60 – 4.65) state that government policy regarding the prevention of terrorism will apply at the expanded airport and that adequate consideration must be given in the design to the management of security risks. It also states that the development must comply with the UK civil aviation safety regime regulated by the CAA. The revised draft ANPS (paragraph 4.65) also states that the expanded airport must comply with aviation security regulations and guidance in the same way as existing airport. The revised draft ANPS (paragraph 5.49) notes that *"Precise flight path designs can only be defined at a later stage after detailed airspace design work has taken place*" and "*Once the design work has been completed, the airspace proposal will be subject to extensive consultation as part of the separate airspace decision making process established by the Civil Aviation Authority*." The decision-making process for this separate consenting regime is defined in UK Air Navigation Guidance 2017 (ANG)[149] and in CAA CAP 1616[150] in line with UK aviation / airspace policy. This has been used to inform the scoping assessment. The revised draft ANPS (paragraph 5.171) states that the planning authority should ensure that water receptors are not put at unacceptable risk or adversely affected by water pollution. The revised draft ANPS (paragraph 5.225) discusses the need to avoid unacceptable risk due to land instability.
National Planning Policy Framework (NPPF): Draft for Consultation (March 2018)	The NPPF sets out the governments planning policies for England and how they are expected to be applied. It provides a framework by which local and neighbourhood plans can be developed. In March 2018, a draft version was released for consultation which will supersede the 2012 document below when it has been agreed and accepted. Paragraph 96 states that planning policies and decisions should promote public safety and take into account wider security and defence requirements by:

[149] Department for Transport, Air Navigation Guidance, 2017
[150] Civil Aviation Authority, CAP1616 Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements, 2017

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Legislation or policy reference	Legislation summary or policy information relevant to major accidents and disasters
	a) Anticipating and addressing all plausible malicious threats and natural hazards, especially in locations where large numbers of people are expected to congregate. Local policies for relevant areas (such as town centre and regeneration frameworks), and the layout and design of developments, should be informed by the most up-to-date information available from the police and other agencies about the nature of potential threats and their implications. This includes appropriate and proportionate steps that can be taken to reduce vulnerability, increase resilience and ensure public safety and security b) Recognising and supporting development required for operational defence and security purposes, and ensuring that operational sites are not affected adversely by the impact of other development proposed in the area. Paragraph 194 of the draft NPPF identifies that Local Planning Authorities should consult appropriate bodies when planning, or determining applications for developments around major hazards.
National Planning Policy Framework (NPPF) (2012)	The NPPF sets out the governments planning policies for England and how they are expected to be applied. It provides a framework by which local and neighbourhood plans can be developed. Paragraph 164 specifically identifies that account should be taken by local advisors and others of up to date information on higher risk sites in their area for malicious threats and natural hazards, including steps that can be taken to reduce vulnerability and increase resilience.
Local Plans	
Hounslow Local Plan 2015-2030, adopted September 2015 Vol 1 **Policy EC3 (j)**	Where adjacent to the River Thames, demonstrate that they will not preclude future rising or set back of the defence as identified in the Thames Estuary 2100 Plan to ensure adequate flood protection for the lifetime of the development.
Policy EQ9 (c)	Demonstrate that all reasonable steps have been taken to reduce the risk of safety related incidents occurring.
Policy EQ9 (d)	Ensure that proposals involving hazardous substances do not cause potential health and safety risks to neighbouring uses; Ensure that future users are not vulnerable to health and safety risks where the proposal is located near existing hazardous substances.
Policy EQ9 (e)	Apply for hazardous substances consent (HSC) where required.

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Heathrow Expansion
Major accidents and disasters:
Relevant legislation, national and local planning policies

Legislation or policy reference	Legislation summary or policy information relevant to major accidents and disasters
Hillingdon Local Plan Part 1, adopted November 2012 Strategic Objective 4 **Policy BE1 (8)**	Ensure that development contributes to a reduction in crime and disorder, is resilient to terrorism, and delivers safe and secure buildings, spaces and inclusive communities. Create safe and secure environments that reduce crime and fear of crime, anti-social behaviour and risks from fire and arson having regard to Secure by Design standards and address resilience to terrorism in major development proposals.
Spelthorne Core Strategy and Policy Development Plan Document, adopted February 2009 **Policy SP6 a)** **Policy EN14** **Paragraph 10.6**	Ensure the design and layout of new development incorporates principles of sustainable development, and creates an environment that is inclusive, safe and secure, is attractive with its own distinct identity and respects the environment of the area in which it is situated. The Council will refuse permission for any proposal likely to significantly increase the risks associated with any particular hazardous installation or impose conditions where necessary to avoid increased risk. Development leading to an increase in people living, working or congregating in the Public Safety Zone will be refused. The policy also reflects the potential contribution of good design to creating safe and secure environments. Community safety is one of the Council's corporate priorities and it therefore attaches particular importance to the integration of safety and security considerations in the design process.
Slough Core Strategy and Policy Development Plan Document, adopted December 2008 **Strategic Objective J** **Core Policy 7** **Core policy 8 2 a)**	To reduce areas subject to risk of flooding and pollution and control the location of development in order to protect people and their property from the effects of pollution and flooding. Development proposals will, either individually or collectively, have to make appropriate provisions for improving road safety; All development will be of a high-quality design that is practical, attractive, safe, accessible and adaptable.

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Appendix 15.3
List of receptors

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1. LIST OF RECEPTORS

1.1.1 The list of receptors are displayed in Table 15.3.1.

Table 15.3.1 Receptors within the study area

Receptor Type	Receptor	Receptor Detail
Designated Land / Water Sites (nationally important)	Staines Moor SSSI	Staines Moor SSSI Ref. 1000111 510.82 hectares
	Wraysbury Reservoir SSSI	Wraysbury Reservoir SSSI Ref. 1007245 205.56 hectares
	Wraysbury & Hythe End Gravel Pits SSSI	Wraysbury & Hythe End Gravel Pits SSSI Ref. 1000509 117.21 hectares
	Wraysbury N.1 Gravel Pit SSSI	Wraysbury No.1 Gravel Pit SSSI Ref. 1007244 57.96 hectares
	Kingcup Meadows and Oldhouse Wood SSSI	Kingcup Meadows and Oldhouse Wood SSSI Ref. 1000820 12.9 hectares
	Bushy Park and Home Park SSSI	Bushy Park and Home Park SSSI Ref. 1477753 540 hectares Longford River passes through this SSSI approximately 7 km downstream from Heathrow.
	Receptors potentially under the flight swathe of aircraft under the control of Heathrow	13 x SSSIs (Biological) Langham Pond SSSI Windsor Forest and Great Park SSSI Black Park SSSI Denham Lock Wood SSSI Fray's Farm Meadows SSSI Syon Park SSSI Richmond Park SSSI Bushy Park and Home Park SSSI Kempton Park Reservoirs SSSI Knight & Bessborough Reservoirs SSSI Dumsey Meadow SSSI Thorpe Park No. 1 Gravel Pit SSSI Thorpe Hay Meadow SSSI

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Major accidents and disasters:
List of receptors

Receptor Type	Receptor	Receptor Detail
		1 x NNR Richmond Park NNR
Designated Land / Water Sites (internationally important)	South West London Waterbodies Ramsar	South West London Waterbodies (Ramsar) Ref. UK11065 830.02 Hectares
	South West London Waterbodies SPA	South West London Waterbodies (SPA) Ref. UK9012171 830.02 Hectares
	Receptors potentially under the flight swathe of aircraft under the control of Heathrow	2 x SACs: Windsor Forest & Great Park SAC Richmond Park SAC There are additional SPA and Ramsar waterbodies but they are part of the South West London Waterbodies, part of which falls within the study area and have been detailed above.
Other designated land	Bedfont Lakes	Bedfont Lakes (LNR) Ref. 1009352 21.59 hectares
	Arthur Jacob Nature Reserve	Arthur Jacob Nature Reserve (LNR) Ref. 1009362 4.14 hectares
	Hounslow Heath	Hounslow Heath (LNR) Ref. 1008967 83.14 hectares
	Cranebank	Cranebank (LNR) Ref. 1009456 6.69 hectares
	Pevensey Road	Pevensey Road LNR Ref. 1009069 10.2 hectares This LNR is located 2 km downstream of the River Crane from Heathrow.
	Crane Park Isalnd	Crane Park Island LNR Ref. 1008856 2.67 hectares This LNR is located 3.5 km downstream of the River Crane from Heathrow.

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Receptor Type	Receptor	Receptor Detail
	Isleworth Ait	Isleworth Ait LNR Ref. 1009769 3.49 hectares This LNR is located approximately 10 km downstream of the River Crane from Heathrow where it join the River Thames.
	Receptors potentially under the flight swathe of aircraft under the control of Heathrow	21 other LNRs have been identified
Scarce Habitat	Scarce Habitat	A variety of habitats have been identified in the study area by the biodiversity topic (Chapter 6: Biodiversity). Relevant areas of land will be considered during the assessment where they can be affected. There are a variety of habitats located within the study area, with a variety of habitats located between Wraysbury and King George VI Reservoirs. This area includes habitats designated as Coastal and floodplain grazing marsh, Lowland meadows, Lowland dry acid grassland, Good quality semi-improved grassland, and additional habitats (mostly reedbeds). There is a large area designated as Coastal and floodplain grazing marsh habitat located by a water treatment facility in the potential borrow pits site to the West. There is an area of habitat designated as Lowland heathland habitat located on the South-East side of the boundary, within 1 km of potential associated built development sites. There are also large areas of habitats designated as Good quality semi-improved grassland habitats located South and South-East, and North-East of the site boundary, located on potential associated built development sites. There are many areas of Deciduous woodland located throughout the study area.

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Major accidents and disasters:
List of receptors

Receptor Type	Receptor	Receptor Detail
		There are small areas of Ancient woodland located throughout the study area.
	Receptors potentially under the flight swathe of aircraft under the control of Heathrow	Additional parcels of the same types of priority habitats listed above have been identified.
Widespread Habitat - Non designated Land	Various	A variety of habitats have been identified in the study area by the biodiversity topic (Chapter 6: Biodiversity). Relevant areas of land will be considered during the assessment where they can be affected.
Widespread Habitat - Non designated Water	Angling Societies	A number of local angling societies / clubs are located in close vicinity (within 1km) of the site (Colnbrook and River Colne).
Groundwater Source of Drinking Water	Drinking Water Safeguard Zone (Surface Water)	A substantial area around Heathrow is designated as a Drinking Water Safeguard Zone (Surface Water), which extends from the property boundary of Heathrow to beyond the study area in all directions except to the East and North-East.
	Receptors potentially under the flight swathe of aircraft under the control of Heathrow	There are several Source Protection Zones that are potentially within the flight swathe. These areas are mainly to the south and west, with two small areas to the north. There are areas of Zone 1 (Inner Protection Zone), Zone 2 (Outer Protection Zone) and Zone 3 (Total Catchment). However, none of these SPZs have an associated Drinking Water Safeguard zone. A substantial area around Heathrow is designated as a Drinking Water Safeguard Zone (Surface Water) which extends from the property boundary of Heathrow in all directions except to the East and North-East. Within this there are Drinking Water Protected Areas (Surface Water) associated with the reservoirs to the west and southwest as well as the River Thames. There is a water treatment facility that contributes to the public drinking water supply located to the East.

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Major accidents and disasters:
List of receptors

Receptor Type	Receptor	Receptor Detail
Groundwater – non-Drinking Water Source	Superficial Deposits Designation	The superficial deposits under the existing airport and the DCO Project under assessment are predominantly classified as a Primary / Secondary A aquifer. It is also categorised as a groundwater vulnerability zone, specifically Major Aquifer High/Intermediate vulnerability. Throughout most of the study area, the bedrock is not designated as an aquifer.
	Receptors potentially under the flight swathe of aircraft under the control of Heathrow	There are areas under the flight swathe that are designated as primary aquifers, secondary aquifers and undesignated areas for the superficial drift deposits. There are small areas of principal and secondary aquifers in the bedrock. Substantial areas of the flight swathe are designated as major aquifer high vulnerability.
Soil and sediment	Soils	The underling soils vary across the study area. It includes the following soil types: 1. Freely draining slightly acid loamy soils (Soil Ref. No. 6) 2. Freely draining slightly acid but base-rich soils (Soil Ref. No. 7) 3. Slowly permeable seasonally wet acid loamy and clayey soils (Soil Ref. No. 17) 4. Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (Soil Ref. No. 18) 5. Loamy and clayey floodplain soils with naturally high groundwater (Soil Ref. No. 20) 6. Loamy soils with naturally high groundwater (Soil Ref. No. 22) 7. Water (Soil Ref. No. 31).
	Receptors potentially under the flight swathe of aircraft under the control of Heathrow	All those listed above, in addition to the following soil reference numbers: 8, 14, 15, and 28.
Built environment (including historic environment)	Schoolhouse (Lord Knyvett's)	Schoolhouse (Lord Knyvett's), Scheduled Monument Ref. 1005920 0.034 hectares

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Major accidents and disasters:
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Receptor Type	Receptor	Receptor Detail
	Romano-British site	Romano-British site 1000yds (910m) W of East Bedfont parish church, Scheduled Monument Ref. 1002042 10.1ha
	Part of a causewayed enclosure	Part of a causewayed enclosure, 632m north-east of Mayfield Farm, Scheduled Monument Ref. 1002043 4.73ha
	Church of St. Mary	Church of St. Mary, Grade I Listed Building List Number 1187042
	The Great Barn, Harmondsworth	The Great Barn, Harmondsworth, Grade I Listed Building List Number 1194332
	Church of St. Peter and St. Paul	Church of St. Peter and St. Paul Grade I Listed Building List Number 1080163
	Church of St. Peter	Church of St. Peter Grade I Listed Building List Number: 1332743
	Receptors potentially under the flight swathe of aircraft under the control of Heathrow	27 Scheduled Monuments, consisting of both sub-surface and surface features. Surface features include Windsor Castle located approximately 10km to the West of Heathrow. 75 Grade I Listed Buildings, including Windsor Castle and all the buildings within its walls. Other Grade I Listed Buildings include various churches, farmhouses and other historic buildings. A single World Heritage Site: Royal Botanic Gardens, Kew is located approximately 10km to the East of Heathrow.
Particular species (Note - these criteria apply nationally - i.e. England, Wales, Scotland)	Various	A wide variety of species have been identified in the study area by the biodiversity topic (**Chapter 6: Biodiversity**). These include both common and protected species. Relevant populations of these will be considered during the assessment where they can be affected.
Marine	None identified	None identified within the study area.
Fresh and estuarine water habitats	River Thames	The River Thames and associated channels and tributaries including the River Ash.

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Receptor Type	Receptor	Receptor Detail
	River Crane	The River Crane and associated channels and tributaries.
	River Colne	The River Colne and associated channels and tributaries including the Wraysbury River, Duke of Northumberlands River, Colne Brook and Longford River.
	Surface water reservoirs	Various artificial reservoirs including the King George VI, Staines and Wraysburys reservoirs
	Lakes	Numerous lakes are within the study area, this includes the Colnbrook West, Orlitts, Old Slade and Saxon lakes.
	Receptors potentially under the flight swathe of aircraft under the control of Heathrow	Additional rivers, channels, reservoirs and lakes may fall under the flight swathe.
Population and Human Health	Airport	Potential populations and human health receptors within the study area include inhabitants, workers, users of leisure facilities and amenities and transport users within all or part of the communities listed. This includes workers, third parties, occupants of aircraft and other members of the public within the airport.
	Longford	
	Colnbrook	
	Harmondsworth	
	West Drayton	
	Sipson	
	Harlington	
	Hayes	
	Hounslow	
	Feltham North	
	Cranford Cross	
	Cranford	
	Heston	
	Bedfont	
	Stanwell	
	Stanwell Moor	
	Poyle	
	Iver and Richings Park	
	Occupants of aircraft under control of Heathrow	
	People under the flight swathe of Heathrow	

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Appendix 15.4
Identification of sources of major accidents and disasters

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1. SOURCES OF MAJOR ACCIDENTS AND DISASTERS

1.1.1 Table 15.4.1 is a generic prompt list and provides a starting point for the assessment. The assessment is not restricted to the list however, and other potential sources revealed during the course of the assessment, have been assessed and allowed for in the scoping assessment.

1.1.2 Equally, not all of the sources in the generic prompt list will be used in the assessment. Those where there is no credible potential, i.e. those that do not present a 'real risk', will not be used.

Table 15.4.1 List of typical sources of major accidents and disasters

External major accidents*	Natural disasters*
Contamination, for example, drinking water supply	Flooding (sea, river, rainfall)
Transport accident including aircraft	Catchment/flood plains mismanagement
Biological agents/disease	Seismic/earthquake
Biohazard/importation hazard	Subsidence
Radiological hazards	Extreme heat/cold
Chemical hazards from external source	Snow
Terrorism	Tsunami
Sabotage and vandalism	Extreme Storm
Cyber-attack and digital/data security	Lightning
Theft	Forest Fire
Civil unrest/Demonstration	Landslip
Bird/ Drone Strike	Disease outbreak
Lasers	Ash cloud and other natural phenomenon affecting inflight safety
Fire/explosion at neighbouring site	Drought
Structural collapse at neighbouring site	Infestation
Excavation failure at neighbouring site	Climate change /resilience (extreme changes to flood (from rainfall, river, and sea), sea rise level, temperature, storm, tsunami, snow loading, and avalanche.)

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Operational phase major accidents
Accidental release of hazardous chemical or flammable material
Structural collapse
Fire
Explosion
Toxic Release
Major Environmental Discharge
Loss of utilities
Loss of waste
Extreme heat (for example flaring)
Rotating equipment
Incidents associated with on-site pipelines or underground services
Historic site-specific hazard (for example unexploded ordnance)
Transportation of dangerous substances
Transport accidents including aircraft
Deficient design or operation
Major accident associated with deficiency in emergency planning, preparedness or provision
Major accident resulting from absent / deficiency of controls for operations outside of normal operation (including in response to emergency)

Construction phase major accidents
Structural collapse
Collapse of excavation
Removal of hazardous spoil
Accidental release of hazardous chemical or flammable material
Fire
Explosion
Toxic Release
Major Environmental Discharge
Loss of utilities
Loss of waste
Temporary Storage
Damage from adjacent establishments
Contractor facilities
Incidents associated with on-site pipelines or underground services
Historic site-specific hazard (for example unexploded ordnance)
Transport Accidents
Deficient design or operation
Major accident resulting from inadequate emergency planning, preparedness or provision

1.1.3 Note 1: External sources of major accidents and disasters listed in Table 15.4.1 are considered for both construction and operational phases, alongside those given for operational and construction phase major accidents.

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Appendix 15.5
Scoping findings

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1. SCOPING FINDINGS

1.1.1 The assessment focuses on those effects that are potentially significant and which are pertinent to decision-making. The full findings of the scoping exercise are contained Table 15.5.2 Section 1: External major accidents; Table 15.5.3 Section 2: Natural disasters, and Table 15.5.4 Section 3: Operation and construction phases. These provide:

1. Lists of potential major accidents and disasters identified for construction and operation phases
2. Conclusions as to whether the potential major accident or disaster identified should be scoped in or out of the EIA, along with the relevant justifications provided.

1.1.2 Table 15.5.1 provides the key used in Table 15.5.2, Table 15.5.3 and Table 15.5.4 to document the reason for proposing to scope out an accident or disaster scenario. Further reasoning is provided below.

Not applicable / below the threshold of major accident and disaster

1.1.3 Scenarios that do not give rise to a major accident or disaster either due to there being no source, pathway or receptor, or due to the magnitude of damage being below the threshold of a major accident and disaster are scoped out. In addition, scenarios in which a source, pathway and receptor are present but for which it is unrealistic to consider that major accident consequences could occur, even if theoretically credible, are also scoped out.

Security risks

1.1.4 It is proposed to scope out security risks from the major accidents and disasters assessment since these aspects will be assessed by the Department of Transport taking advice from the CAA and Centre for the Protection of National Infrastructure during the consenting process.

1.1.5 Heathrow will consult with relevant security experts from the Centre for the Protection of National Infrastructure and the Department for Transport to ensure that physical, procedural and personnel security measures have been adequately considered in the design process, and that adequate consideration has been given to the management of security risks.

1.1.6 Security risks are managed by Heathrow Airport Limited in association with the Police and security services as well as compliance with relevant CAA/EASA codes

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of practice. Existing facilities will extend to the DCO Project with the same or improved quality of provision.

Biosecurity

1.1.7 It is proposed to scope out biosecurity risks on the following basis:

1. Heathrow is an approved Border Inspection Post and provides facilities and a framework under which the Port Health Authority (PHA) operates. The framework and facilities are subject to inspection by the CAA
2. The increase in the number of people and animals / animal products entering the UK via Heathrow, and the opening up of routes from new destinations will be matched by a proportionate increase in facilities aligned to the demand created by an expanded airport
3. If the DCO Project were to not proceed, movements of people, animals and animal products would likely increase via other routes, therefore the change in effect of major accident and disasters resulting from the DCO Project is negligible.

Occupational safety hazards

1.1.8 It is proposed that accidents that could impact one or two workers[1] are scoped out of the EIA. These risks are managed under the general obligations of the Health and Safety at Work Act 1974 and are not generally recognised as a major accident.

1.1.9 Under the Health and Safety at Work Act 1974 and secondary legislation made under the Act, employers are required to manage the risk to their employees and others who could be affected by their activities, and to ensure that the risk is as low as reasonably practicable (ALARP). This includes complying with relevant good practice as a minimum (refer to Appendix 15.2 and 15.6).

1.1.10 It is not proposed to scope out accidents that could result in a large number of casualties among workers and / or casualties amongst members of the public during construction and operation.

1.1.11 For example, a major accident or disaster that could lead to the death of one to two workers due to build-up of a non-breathable atmosphere when working in confined space is scoped out; build-up of flammable gas in a confined space that

[1] In this context a 'worker' is considered to be a person employed on the Project, either directly or indirectly, during construction and/or operation phase. For example it does not include a passenger who is travelling on business.

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could explode resulting in building collapse and large numbers of fatalities is not scoped out.

Other scoped out effects

1.1.12 Certain major accident and disasters which present an already low likelihood of significant effect that are managed by current Heathrow procedures and facilities that will be extended proportionally to the DCO Project are proposed to be scoped out. This includes:

1. Damage to artefacts of national or international importance during transit through Heathrow - it is expected that those responsible for artefacts would undertake a specific risk assessment to ensure that the risk was acceptable
2. Damage to a rare species during transit through Heathrow - it is expected that those responsible for the rare species would undertake a specific risk assessment to ensure that the risk was acceptable.

1.1.13 Impairment of control measures (including fire service and policing) when this is known about in advance and Heathrow contingency measures, for example, to restrict operations are put into effect. Impairment is considered indirectly when embedded mitigation is considered.

1.1.14 Major accidents and disasters for which the causes are not location specific and the cause and control are external to Heathrow (i.e. Heathrow is a receptor). The risk of these events are assessed and the response coordinated by the relevant local authorities under the Civil Contingencies Act. Although the DCO Project will change the number and locations of receptors, it is 'more of the same' and the interface between the off-site authorities and Heathrow in responding to such an event will not change substantially.

Key to scoping tables

1.1.15 The key for scoping out justification are tabulated in Table 15.5.1. The findings of the scoping assessment are presented in Table 15.5.2, Table 15.5.3 and Table 15.5.4.

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Table 15.5.1 Key for Table 15.5.2, Table 15.5.3 and Table 15.5.4

Code	Description
Sec	Security risks managed in associated with the Police and security services
Bio	Biosecurity risk, managed by Port Health Authority, using facilities provided by Heathrow. Facilities to extend proportionally to the DCO Project, with the same quality of provision.
BAU	Other scoped out effects which present an already low likelihood of significant effect including impairment of control measures (for example fire service and policing) when this is known about in advance, and major accidents and disasters for which the causes are not location specific and the cause and control are external to Heathrow, and appropriate systems are in place for current operations, and will be extended to cover the DCO Project with the same quality of provision.
HSAWA	Occupational safety, affecting at most 1-2 workers, managed under Health and Safety at Work Act and associated Regulations, and Management of Health and Safety at Work Act.
Sub	Consequences are below the threshold for major accidents and disasters
N/A	No source of major accident / disaster, no pathway, no receptor or no change to baseline
neg	Increase in risk is not significant in comparison to the current baseline. Current measures extend proportionally to the DCO Project, with the same quality of provision.

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Table 15.5.2 Section 1: External major accidents

Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
1.1. External Transport Accident, road air or rail (for example aircraft not under the control of Heathrow / rail transport that is not part of the DCO / road vehicles outside the DCO)	Aircraft - not under control of Heathrow, impacts with the DCO Project or project airspace (people / structure / vehicles inc. aircraft equipment)	No		No	neg	EASA Licensing / CAP 168: Licensing of Aerodromes
						Pilot licensing (EASA, ICAO, NPPLM, NPLLSSEA) regulated by the CAA
						The background risk of an accident involving aircraft not under control of Heathrow is low and not substantially changed by the Project.
	Road / rail vehicle outside DCO impacts with the DCO Project (people / structure / vehicles inc. aircraft /equipment)	Yes		Yes		
	Transport event - blockage of emergency access/egress	Yes		Yes		
1.2. Biological agents / biohazard/ disease (human, animal, plant) / pathogen - import	Screening (wrong or undeclared substance), monitoring, handling, control and management	N/A		No	BAU	Heathrow is an approved Border Inspection Post, and so provides facilities and a framework under which the Port Health Authority operate. The framework and facilities are subject to inspection by the CAA.
	Planned Importation - Screening, monitoring, handling, control and management	N/A		No	BAU	Heathrow is an approved Border Inspection Post, and so provides facilities and a framework under which the Port Health Authority operate. The framework and facilities are subject to inspection by the CAA.
	Disembarkation of travelers / flight with controlled disease/ biohazard	N/A		No	BAU	Heathrow is a major UK airport with passenger disembarkation controls in line with UK border control requirements, working with Public Health England.
1.3. Damage to Artefacts of national/ international importance - import / export	Screening (wrong or undeclared substance) , monitoring, handling, control and management	N/A		No	BAU	Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
						Each artefact would be subject to a risk assessment by the artefact owner and insurers.
	Planned Import/ Export- Screening, monitoring, handling, control and management	N/A		No	BAU	Each artefact would be subject to a risk assessment by the artefact owner and insurers.
1.4 Radiological hazards - import / export	Screening (wrong or undeclared substance) , monitoring, handling, control and management	N/A		No	BAU	Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
	Planned Import / Export- Screening, monitoring, handling, control and management	N/A		No	BAU	Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
1.5. Chemical hazards - import / export	Screening (wrong or undeclared substance) , monitoring, handling, control and management	N/A		No	BAU	Current facilities will be extended proportionally to the DCO Project with the same quality of provision.

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
	Planned Import / Export - Screening, monitoring, handling, control and management	N/A		No	BAU	Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
1.6. Malicious attack	Major attack on persons at airport, DCO transport System and associated infrastructure or on environment	No	Sec	No	Sec	CAP 1223: Framework for an Aviation Security
						Guidance on policing at airports. London: ACPO, ACPOS, NPIA, NPIA, (2011).
						National Aviation Security Program - the design and operation of the Heathrow Northwest Runway scheme must comply with aviation security regulations and guidance in the same way as existing airports.
						Heathrow will consult with relevant security experts from the Centre for the Protection of National Infrastructure and the Department for Transport to ensure that physical, procedural and personnel security measures have been adequately considered in the design process, and that adequate consideration has been given to the management of security risks.
	Cyber attack and digital/data security (infrastructure/services), leading to major accident/ initiator at airport	No	Sec	No	Sec	Current systems management will be extended to the DCO Project.
						CAP 1574: 26 Security Controls for Regulation
1.7. Sabotage, vandalism, theft	Within the DCO Project - Leading to major accident/ initiator	No	Sec	No	Sec	CAP 1223: Framework for an Aviation Security
						Guidance on policing at airports. London: ACPO, ACPOS, NPIA, NPIA, (2011).
	External - leading to major accident / initiator in the DCO Project	No	Sec	No	Sec	CAP 1223: Framework for an Aviation Security
						Guidance on policing at airports. London: ACPO, ACPOS, NPIA, NPIA, (2011).
1.8. Industrial action	Leading to impairment of major accident/ initiator control (including fire service and policing, and ground crew)	Yes		No	BAU	Heathrow implement contingency plans including where necessary a restriction on operations. This is an extension of existing arrangements.
1.9. Widespread public disorder	Leading to major accident/ initiator	No		No	Sec	Guidance on policing at Airports, National Policing Improvement Agency
1.10. External Aircraft interference	Lasers, fireworks, sky lanterns	N/A		No	BAU	Handling of laser exposure occurrences given in CAP 789 Requirements and Guidance Material for Operators, Chapter 18. Detailed guidance on managing risks is also issued by ICAO: Doc 9815 Manual on Laser Emitters and Flight Safety
						CAP 736 Operation of Directed Light, Fireworks, Toy Balloons and Sky Lanterns within UK Air Space
	Drones	N/A		No	BAU	Emerging issue - covered by control of airspace. Will be covered specifically by EASA NPA 2017-05 (A) Introduction of a regulatory

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
						framework for the operation of drones; and further guidance also given in CAP 1559, and CAP 1627
	Wind turbine interaction with radar	N/A		No	neg	Guidance given in CAP 764: CAA Policy and Guidelines on Wind Turbines
						No large wind turbines in the vicinity, Any new wind farm would be subject to planning controls, including consideration of airport safety.
	Bird Strike	N/A		Yes		Retained in scope as the DCO Project may include changes to bird habitats
						CAP 772 Wildlife Hazard Management at Aerodromes.
						Guidance for acceptable compliance also given in EASA NPA 2011-20 (B.II) Authority, Organisation and Operations Requirements for Aerodromes
1.11. Industrial/ urban event external to site	Fire / Explosion at adjacent site/building - escalation to the DCO Project, release of toxic smoke	Yes		Yes		
	Structural Collapse or escalation failure at adjacent site/ building- (structural collapse, excavation)	Yes		Yes		
	Release of hazardous substance from adjacent site/ building (for example a toxic event, biological release)	Yes		Yes		
	Radiological/ biological contamination	Yes		Yes		
	Sudden release from dam/ reservoir/ canal	Yes		Yes		Refer also to Scoping chapter 20, 'Water - A Flood Risk Assessment will be carried out in accordance with planning guidance on flood risk.
	Biological agents/ biohazard/ disease - Outbreak/ source in locality	No	BAU	No	BAU	Cause is not location specific and the cause and control measures are outside scope of Heathrow (i.e. Heathrow is a receptor). Current operational measures to liaise with off-site authorities in this event will be extended proportionally to the DCO Project.
	Food/water contamination	No	BAU	No	BAU	Cause is not location specific and the cause and control measures are outside scope of Heathrow (i.e. Heathrow is a receptor). Current operational measures to liaise with off-site authorities in this event will be extended proportionally to the DCO Project.
	Smoke - building fire, warehouse, bonfire, leading to low visibility	Yes		Yes		Low visibility operations (LVO) covered in CAP 168 Licensing of aerodromes and EASA Annex to ED 2012/019/R Subpart E
1.12. Widespread utility/ system failure external to site.	Electrical/gas/site water/drinking water (inc. contamination)/waste water/fuel/communications or Shared	Yes		No	BAU	All safety and security critical systems are required to have backup power supply under CAP 168, CAP 670, and EASA CS-ADR-DSN Chapter S; therefore consequences below threshold.

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
	infrastructure/ utilities/ services/ facilities/ communications					The PEIR will consider loss of power to specific safety / environmental critical equipment within the DCO Project, under 'operations & construction'.

Table 15.5.3 Section 2: Natural disasters

Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
2.1. Flooding (sea/coastal, river, rainfall, surface water, flash)	Flooding of permanent or temporary asset including construction sites (for example terminal building, road access tunnel, cargo and maintenance facilities) leading to damage to people or environment	Yes		Yes		
	Floating of asset (for example storage tank, packaged goods, vehicles) leading to a hazardous release or casualties	Yes		Yes		
	Flooding with contamination leading to detriment to environmental receptor	Yes		Yes		
	Flooding leading to runway excursion	N/A		Yes		CAP 168 Appendix 31: Runway end safety areas
2.2. Catchment/flood plains mismanagement by 3rd parties	Increased risk of surface water flooding, leading to damage to people or environment	Yes		Yes		
2.3. Seismic/earthquake	Seismic event leading to building instability/ collapse	Yes		Yes		
2.4. Subsidence	Subsidence leading to building instability/collapse	Yes		Yes		
2.5. Extreme heat/cold	Instrument / navigation failure resulting from extreme cold	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes Adverse weather procedures in place to restrict airport operations and flights extreme weather. Flight procedures and restrictions in line with EASA and CAA guidelines for adverse weather.
	Cold Embrittlement	Yes		Yes		
	Degradation of runway surface	N/A		No	BAU	EASA Licensing / CAP 168: Licensing of Aerodromes Adverse weather procedures in place to restrict airport operations and flights extreme weather. Flight procedures and restrictions in line with EASA and CAA guidelines for adverse weather.

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
2.6. Snow/ice/hail	Runway excursion	Yes		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
						Adverse weather procedures in place to restrict airport operations and flights extreme weather. Flight procedures and restrictions in line with EASA and CAA guidelines for adverse weather.
	Leading to impairment of major accident/ initiator control (including fire service and policing, insufficient ground crew)	Yes		No	BAU	Heathrow implement contingency plans including where necessary a restriction on operations. This is an extension of existing arrangements.
	Snow loading of building or other asset	Yes		Yes		
2.7. Tsunami	Tsunami	N/A		N/A		Not considered reasonably foreseeable at Heathrow
2.8. Extreme Storm inc. Strong winds/gales/ hurricanes/storms	Damage to occupied building and assets	Yes		Yes		
	Debris leading to impact of persons or asset	Yes		Yes		
	Damage to temporary structures (scaffolding, cranage)	Yes		Yes		
	Damage to aircraft on ground or in flight under control of Heathrow	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
2.9. Low visibility	Fog restricting ground visibility leading to aircraft incident	Yes		Yes		Low visibility operations (LVO) covered in CAP 168 Appendix 2B and EASA Annex to ED 2012/019/R Subpart E
	Fog restricting ground visibility leading to land transport incident	Yes		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
2.10. Lightning	Lightning strike leading to electrocution, fire, building damage / debris resulting in damage to people or environment	Yes		Yes		
	Lighting strike to aircraft in flight	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
						Adverse weather procedures in place to restrict airport operations and flights extreme weather. Flight procedures and restrictions in line with EASA and CAA guidelines for adverse weather.
2.11. Wild fire/Forest Fire	Fire threatens asset, permanent or temporary asset including construction sites (for example terminal building, road access tunnel, cargo and maintenance facilities) leading to damage to people or environment.	N/A		N/A		Not considered credible
2.12. Landslip/ land movement	Significant land movement due to natural phenomena	No	neg	No	neg	No significant

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
2.13. Disease outbreak in surroundings, for example pandemic influenza, emerging infectious disease including animal diseases communicable to people	Health with possible fatalities to workers and visitors, with potential for further infection outside of airport	Yes		No	BAU	Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
	Leading to impairment of major accident/ initiator control (including fire service and policing, insufficient ground crew)	Yes		No	BAU	Heathrow implement contingency plans including where necessary a restriction on operations. This is an extension of existing arrangements.
2.14. Animal disease	Animal disease in locality affects quarantined or imported valuable species	N/A		No	BAU	Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
2.15. Drought	Loss of water supply - leading to welfare issues of passengers and staff	No	neg	No	neg	Also considered in Scoping Chapter 9, Climate change and scoping Chapter 20, Water
	Loss of water supply leading to failure of safety critical service, for example firewater	Yes		Yes		
	Foundation cracks / settlement leading to failure of building / asset and damage to people / environment.	Yes		Yes		
2.16. Infestation	Damage to essential safety equipment	N/A		No	BAU	Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
2.17.Ash cloud, volcanic eruptions and other natural phenomenon affecting in flight safety		No	neg	No	neg	Guidance material on Volcanic Ash given in CAP 1236: Guidance regarding flight operations in the vicinity of volcanic ash, and EASA NPA 2012-07
2.18. Space Weather, for example geomagnetic storms, radiation storms and solar flares	Severe space weather leads to loss of systems, for example loss of primary navigation system, loss of communications	N/A		No	BAU	UK Government space weather preparedness strategy
						Severe solar weather is also a cause of electrical power failure, which has been considered in external hazards, for all causes.
2.19. Climate change /resilience	Extreme changes to flood (from rainfall, river, and sea), sea rise level, temperature, storm, tsunami, snow loading, and avalanche.	Yes		Yes		Refer also to scoping Chapter 9, Climate change.
						Consideration of climate change will be incorporated in the assessment years.

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Table 15.5.4 Section 3: Operation and construction phases

Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
3.1. Transport Accident - Aircraft Incident on runways, taxiways and apron (Note this includes Standing, pushback /towing and taxiing, take-off and landing)	Aircraft collision with vehicle, structure, other aircraft/ wind turbine/ cranes / tall object leading to injury / loss of life to people	Yes		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
						CAP 738 Safeguarding of Aerodromes Appendix C / EASA CS-ADR-DSN Certification Specifications and Guidance Material for Aerodromes Design - Book 2 - Chapter H
	Runway/ taxiway incursion leading to aircraft accident leading to injury / loss of life to people	Yes		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
						CAP 168 Appendix 31: Runway end safety areas
						CAP 637 Visual Aids Handbook, Chapters 1-5
	Runway excursion leading to aircraft accident leading to injury / loss of life to people	Yes		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
						CAP 168 Appendix 31: Runway end safety areas
						CAP 637 Visual Aids Handbook, Chapters 1-5
	Failure of taxiway /runway maintenance and loss of integrity leading to leading to injury / loss of life to people	Yes		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
	Foreign object damage to aircraft leading to aircraft accident leading to injury / loss of life to people	Yes		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
						Appendix 3E: Aerodrome movement areas - clearance of Foreign Objects and Debris (FOD)
	Flying debris / detached object from aircraft impacting a vehicle, person or aircraft leading to injury / loss of life to people	Yes		Yes		EASA Certificate of Airworthiness validated annually with an Airworthiness Review Certificate
						CAP 747 Mandatory requirements for Airworthiness
						EASA Airworthiness Directives
	Aircraft incident due to error in ground handling - design, inspection, maintenance leading to injury / loss of life to people	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
						Appendix 3E: Aerodrome movement areas - clearance of Foreign Objects and Debris (FOD)
	Incorrect of off specification fuel /chemical delivered to aircraft	N/A		Yes		CAP 748 Aircraft Fuelling and Fuel Installation Management
	Failure of controls for operation /logistics /coordination /planning leading to aircraft incident leading to injury / loss of life to people	Yes		Yes		CAP 1168 Guidance Material for Organisations, Operations and Design Requirements for Aerodromes, Chapter: Emergency Planning
	Aircraft collision with person on the apron	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
	Aircraft collision with structure/equipment at airport leading to injury / loss of life to people	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
	Aircraft collision with other vehicle/ aircraft/ transport unit leading to injury / loss of life to people	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
	Wake vortex	N/A		No	Sub	Consequences (property damage) are below the threshold of major accident and disaster.
	Human error leading to aircraft incident and injury / loss of life - visiting airlines/pilots control	Yes		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
	Aircraft incident resulting in substantial fuel spill (unignited) / other hazardous material released to the environment	N/A		Yes		
	Fire involving aircraft at stand, apron, runway and taxiways leading to injury / loss of life to people	N/A		Yes		CAP 1168 Guidance Material for Organisations, Operations and Design Requirements for Aerodromes, Chapter: Rescue and Fire Fighting Service (RFFS)
	Rotating aircraft equipment - failure of equipment or systems leading to injury / loss of life	N/A		No	BAU	EASA Licensing / CAP 168: Licensing of Aerodromes
						EASA Certificate of Airworthiness validated annually with an Airworthiness Review Certificate
3.2. Transport Accident - Aircraft Incident whilst airborne and under control of Heathrow (Includes initial climb, and approach. Departing aircraft that have completed their initial climb, and aircraft flying to Heathrow but not yet on approach, are outside the bounds of the assessment.)	Airspace design (Aircraft / aircraft collision) leading to injury / loss of life to people	N/A		Yes		CAP 493 Manual of Air Traffic Services, Section 4 Chapter 2: Area Control Procedures
	Flying debris / detached object from aircraft impacting a vehicle, person or aircraft leading to injury / loss of life to people	No	neg	Yes		EASA Certificate of Airworthiness validated annually with an Airworthiness Review Certificate
						CAP 747 Mandatory requirements for Airworthiness
						EASA Airworthiness Directives
						CAP 1616 Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements
	Aircraft incident during manoeuvring	N/A		N/A		Manoeuvring not anticipated at Heathrow
3.3. Transport Accident - Airside (other vehicles)	Collision from ground vehicle inc. air bridge leading to injury / loss of life	N/A		Yes		CAP642 includes guidance for airside vehicle operation and driving.
	Substantial fuel spill (unignited) released to the environment	N/A		Yes		
	Transport accident caused by error in Design/inspection/maintenance leading to injury / loss of life	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
	Failure of controls for operation/ logistics/ coordination/ planning leading to injury / loss of life	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes
	Vehicle collision with person	N/A	HSAWA	No	HSAWA	CAP 642 includes guidance for airside vehicle operation and driving.
	Vehicle collision with structure/equipment at airport leading to injury / loss of life	N/A		Yes		CAP 642 includes guidance for airside vehicle operation and driving.

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
	Vehicle collision with other vehicle/aircraft /transport unit leading to injury / loss of life	N/A		Yes		CAP 642 includes guidance for airside vehicle operation and driving.
	Vehicle fire leading to injury / loss of life	N/A		Yes		
	Human error leading to transport incident leading to injury / loss of life	N/A		Yes		CAP 642 includes guidance for airside vehicle operation and driving.
	Incursion impacting road vehicle, for example construction vehicle	Yes		Yes		
3.4. Transport Accident - Landside road or construction site	Vehicle (car / HGV/ passenger vehicle) collision with other vehicle, or structure (for example building, road bridge)	Yes		No	BAU	
	Vehicle collision with pedestrian(s)	Yes		Yes		
	Multi vehicle collision on new or diverted road	Yes		Yes		
	Vehicle fire in a tunnel	Yes		Yes		
3.5. Transport accident - Rail	Collision involving rail transport vehicle resulting in injury / loss of life / damage to environment	Yes		Yes		
	Electrocution with overhead lines or electrified tracks	No	HSAWA	Yes		
	Train fire (tunnel)	Yes		Yes		
3.6. Release of hazardous substance that is dangerous to the environment or human life (toxic) - solid/liquid/vapour From storage, movement and handling of hazardous material including third parties / tenants and contractors during demolition, construction, operation	Loss of containment during storage and handling of hazardous substances	Yes		Yes		
	Loss of containment during transport of hazardous substances, including cargo, freight	Yes		Yes		
	Loss of operational control leading to release (for example overflow, human error, equipment failure)	Yes		Yes		
	Accidental release from pipeline including underground and over ground (for example aviation fuel, gas)	Yes		Yes		
	Co-storage of incompatible chemicals leading to a reaction and release of chemicals	Yes		Yes		
	Collision/impact/structural collapse (inc. dropped/swung load) leading to release	Yes		Yes		
	Use of incorrect or hazardous chemical in operation on the land/water/air environment	Yes		Yes		
3.7. Fire /explosion (involving flammable substances such as fuel or other	Release of flammable substance with ignition from storage and handling	Yes		Yes		

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
stored/used material) - including third parties / tenants and contractors during demolition, construction, operation	Ignited release of flammable substance during transport, including cargo, freight	Yes		Yes		
	Ignited release of flammable substance from pipeline including underground and over ground (for example aviation fuel, gas)	Yes		Yes		
	Loss of operational control leading to release of flammable substance (for example overflow, human error, equipment failure)	Yes		Yes		
	Collision/impact/structural collapse (inc. dropped/swung load) leading to release	Yes		Yes		
	Ignition in oxygen rich environment	Yes		Yes		
	Co-storage of incompatible chemicals leading to a reaction and release of flammable chemicals	Yes		Yes		
	Escalation from smaller fire	Yes		Yes		
	Extreme heat (for example flaring) with potential for multiple injuries	N/A	N/A	N/A	N/A	Flaring not planned to take place within the DCO Project or study area.
3.8. Fire - Building/ combustible material fire including third parties / tenants and contractors	Fire in a large complex buildings (for example terminals including retail and catering facilities, hotels)	Yes		Yes		
	Fire in the waste handling, warehousing, or stockpiling facilities	Yes		Yes		
	Fire in temporary facilities	Yes		Yes		
	Escalation from smaller fire	Yes		Yes		
3.9. Explosion - Physical burst (including third parties / tenants and contractors)	Boiler explosion / pressure vessel failure (or example design, inspection, maintenance, human error, external heating (boilers, cylinders)	Yes		Yes		
3.10. Structural collapse/failure (including third parties / tenants and contractors)	Structural collapse / failure leading to injury / loss of life/ damage to the environment (from buildings, structures, bridges, tunnels, storage, roads, construction equipment, mobile equipment, waste and spoils) For example, impact, dropped / swung load from crane, instability,	Yes		Yes		
3.11. Projectiles/rotating equipment	Failure of rotating equipment leading to projectiles	Yes		No	N/A	

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
3.12. Disease (human, animal, plant) / Biohazard onsite handling and storage	Release from quarantine/ storage centres, including waste and disposal	N/A		No	BAU	Heathrow is an approved Border Inspection Post and provides facilities and a framework under which the Port Health Authority (PHA) operates. The framework and facilities are subject to inspection by the CAA.
						Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
3.13. Exposure to biological agent/hazard during operation or construction	Loss of containment from storage or transport container	Yes		Yes		
	Generation of biological agent due to inadequate controls (legionella)	Yes		Yes		Notification of Cooling Towers and Evaporative Condensers Regulations (S.I.1992/2225), 1992.
	Other biological hazards, for example Psittacosis, Leptospirosis / Weil's, *E.coli,*	No	HSAWA	No	HSAWA	
3.14. Food/water contamination	Failure of onsite monitoring, handling, control and management, including security leading to contamination of food or water sources	Yes		No	BAU	Regulations governing supply of potable water. Food Standards Agency.
						Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
3.15. Radiological substance onsite handling and storage (operation, construction)	Failure of onsite monitoring, handling, control and management, including security leading to a release	No	HSAWA	No	BAU	Current facilities will be extended proportionally to the DCO Project with the same quality of provision.
3.16. Other hazardous agent (including third parties / tenants and contractors)	Electricity	No	HSAWA	No	HSAWA	
	Noise	No	Sub	No	Sub	Control of Noise at Work Regulations (S.I. 2005/1643), 2005.
3.17. Hostile environment	Low oxygen/poor air quality	No	HSAWA	No	HSAWA	
	Confined/high space hazards	No	HSAWA	No	HSAWA	Ingress into confined space of landfill gas to be considered (as historic hazard). Confined space entry for workers scoped out as it is an occupational safety hazard, controlled under HSAW and associated Regulations including Confined Spaces Regulations 1997 and Construction (Design and Management) Regulations 2015.
	Extreme temperature environments (hot/cold)	No	HSAWA	No	HSAWA	
3.18. Historic site specific hazard (for example unexploded ordnance, contamination)	Unexploded Ordnance (UXO)	Yes		No	neg	
	Release of landfill gas	Yes		Yes		
	Exposure to historical ground contamination (for example historic landfill)	Yes		N/A		
	Exposure to contaminated hazardous items in clearance site, for example discarded needles contaminated with blood borne viruses including Hepatitis B&C and HIV	No	HSAWA	N/A		Potential hazard associated, for example, with demolition or clearing of landfill, however each incident is unlikely to affect more than one person, and the risk is managed under existing H&S regulations.
	Other land/ water contamination with Major Accident implications	Yes		Yes		
	Exposure to asbestos / other hazardous materials in existing building, during demolition	Yes		N/A		Use of asbestos in new buildings is prohibited by law, therefore not applicable to the operation phase of the DCO Project. Asbestos may be

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
						an issue for demolition (to be determined). It is noted that any buildings containing asbestos would require demolition at some point in future.
3.19. Loss of utilities (onsite)	Electrical/gas/site water/drinking water (inc. contamination)/waste water/refrigeration/fuel leading to injury / loss of life or damage to the environment	Yes		Yes		
3.20. Loss of essential safety/ environmental systems and services	Air safety and air side systems (Communication, airstrip lighting, emergency lighting, NAVAID, radar signage emergency power, emergency isolation, detection)	N/A		No	BAU	EASA Licensing / CAP 168: Licensing of Aerodromes CAP 670 Air Traffic Services Safety Requirements, Part B Section 2 ATC 03: Emergency or Contingency Facilities
	Land safety / environmental systems (Communication, emergency lighting, emergency power, emergency isolation, detection, ventilation)	Yes		Yes		
3.21. Loss of safety critical workers	Unavailability of resource, for example, due to industrial action, or pandemic illness	N/A		No	BAU	EASA Licensing / CAP 168: Licensing of Aerodromes CAP 670 Air Traffic Services Safety Requirements, Part B Section 2 ATC 03: Emergency or Contingency Facilities
3.22. Absent or deficient emergency plan, preparedness or provision - Aircraft safety incident	Absent or deficient emergency plan provision for aircraft safety incident For example a major accident resulting from failure to identify and prepare for foreseeable emergencies (resource, mobilisation and communication, information equipment) failure to maintain / train / exercise	N/A		Yes		EASA Licensing / CAP 168: Licensing of Aerodromes CAP 670 Air Traffic Services Safety Requirements, Part B Section 2 ATC 03: Emergency or Contingency Facilities CAP 760: Guidance on the Conduct of Hazard Identification, Risk Assessment and the Production of Safety Cases
3.23. Absent or deficient emergency plan, preparedness or provision - Environmental incidents and non-aircraft safety incidents	Inadequate identification of potential major accidents and disasters / inadequate preparation	Yes		Yes		
	Major accident or disaster resulting from emergency response action, for example, release of contaminated firewater, fire fighting foam, use incorrect chemical	Yes		Yes		
	Consequences increased, for example, failure to evacuate affected building, emergency responders do not maintain sufficient distance	Yes		Yes		
	Equipment failure (alert, fire protection, PPE, communications equipment)	Yes		Yes		
3.24. Absent or deficient consideration of major accidents and disasters in design	Design (equipment, containment, integrity, location, separation, drainage/interceptor, height of equipment/buildings), maintenance, inspection failure - loss of integrity.	Yes		Yes		

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Hazard	Description	Scope in for construction?	Code (Construction)	Scope in for Operation?	Code (Operation)	Justification / Comments
3.25. Absent or deficient safety/ environmental management systems	Absent or deficient safety management system – for example inadequate planning, resource provision, procedures	Yes		No	BAU	
3.26. Absent or deficient security provision	Absent or deficient security management system – for example inadequate planning, resource provision, procedures	Yes		No	BAU	CAP 1223: Framework for an Aviation Security
						Guidance on policing at airports. London: ACPO, ACPOS, NPIA, NPIA, (2011).
						Current facilities will be extended proportionally to the DCO Project with the same quality of provision.

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Appendix 15.6
Relevant guidance

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1. RELEVANT GUIDANCE

1.1.1 Relevant guidance to the major accidents and disasters topic is outlined in Table 15.6.1.

Table 15.6.1 Relevant guidance to major accidents and disasters

Guidance	Comment
Environmental Impact Assessment of Projects, Guidance on the Preparation of the Environmental Impact Assessment Report, European Commission, 2017	Guidance on how to develop good quality environmental impact reports to ensure appropriate information is available for decision making purposes. The guidance provided by the European Commission highlights that the context for inclusion of major accidents and disasters is to ensure that adequate focus is given to the provisions for events leading to significant risk with an objective of building resilience in a development against such effects. The bar for what is tolerable to society is therefore set somewhat more onerously for major accidents and disasters than for a smaller event of much lower magnitude.
Guidelines in Environmental Management for Facilities Storing Bulk Quantities of Petroleum Products and Other Fuels, Energy Institute, 3rd edition, May 2015	Guidance on managing environmental issues involved in the design, construction, operation and decommissioning of bulk storage facilities. Promoting application of good environmental management systems and environmental risk assessment, and addressing inherent environmental protection. Applicable to facilities which do not fall into Control of Major Accident Hazards (COMAH) regulations, and those that do. Application of existing major accidents and disasters guidance (principally CDOIF, Version 2) to both non-COMAH and COMAH establishments is an approach suggested for environmental management of facilities in publications such as that of the Energy Institute, 2015.
Chemicals and Downstream Oil Industry Forum (CDOIF) Guideline – Environmental risk tolerability for COMAH establishments V2	Guidelines on the assessment and tolerability of major accidents to the environment (established in relation to COMAH sites).
Guide to predicting environmental recovery durations for Major Accidents Energy Institute, 2017	Establishes guidance on recovery time for ecosystems following a major accident in relation to the environmental fate of released chemicals.
Guidance on the Interpretation of Major Accidents to the environment for the	Guidance on what would constitute a major accident to the environment (from the perspective of COMAH regulations).

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Guidance	Comment
purposes of COMAH regulations, Department of the Environment, Transport and the Regions, June 1999	
All Measures Necessary – Environmental Aspects Guidance to the Competent Authority Inspectors and Officers, HSE/EA/SEPA/Natural Resources Wales, ONR, April 2016	Guidance in relation to COMAH for the management of risk relating to environmental aspects of major accidents and discussion of concepts for proportionality and risk tolerability.
Safety and Environmental Standards for Fuel Storage Sites Process Safety Leadership Group, HSE, 2009	Standards established to specify minimum standards of control storing large quantities of gasoline. Applicable to facilities falling within scope of COMAH.
Guidance: Hazardous Substances[1]	Guidance on how to consider hazardous substances in land use planning and relevant planning controls. It includes guidance on how to assess whether Hazardous Substance Consent is required based on the intended inventory.
Guidelines for Environmental Risk Assessment and Management Green Leaves III, Dept. of Environment, Food and Rural Affairs, November 2011	Guidelines for the management and assessment of environmental risk.
CIRIA C736 Containment Systems for the Prevention of Pollution: Secondary, Tertiary and Other Means for Industrial and Commercial Premises.	Good practice guidance on pollution prevention to assist owners and operators of commercial and industrial premises storing substances which may be hazardous to the environment.
Reducing Risks Protecting People (R2P2), Health and Safety Executive. (2001)	The Health and Safety Executive's (HSE) decision making process. Protocols and procedures followed in decision making in relation to the protection of human life in the UK. The tolerability criteria for risk to people, including the aversion for large numbers of casualties resulting from single incidents, has been referenced in setting the criteria for assessing the significance of effects on people.
Air Navigation Guidance, Department for Transport 2017	Guidance to the Civil Aviation Agency (CAA) on its environmental objectives when carrying out its air navigation functions and to the CAA and wider industry on airspace and noise management. It includes overriding need to maintain a high standard of safety.
CAP760 - Guidance on the Conduct of Hazard Identification, Risk Assessment and the Production of Safety Cases – Civil Aviation Authority (2010)	Provides information for Air Traffic Service Providers and Aerodrome Operators on Hazard Identification, Risk Assessment and Developing Safety Cases.

[1] Guidance: Hazardous substances https://www.gov.uk/guidance/hazardous-substances (accessed 1 December 2017)

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Guidance	Comment
CAP 795, Civil Aviation Authority, Safety Management Systems Guidance for organisations, February 2015	Guidance on safety management of operational airports including risk criteria for human harm.
CAP1616 , Civil Aviation Authority, Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements, 2017	Describes the regulatory process for permanent and temporary changes to airspace. Requires the sponsor to prepare a safety assessment of any proposed changes at 'Options Appraisal'. The safety assessment is developed in increasing detail as the proposed changes progress through the process.
Managing health and safety in construction: Construction (Design and Management) Regulations 2015, Guidance on Regulations (L153) 2015	Guidance on the Construction (Design and Management) Regulations 2015.
HID Regulatory Model: Safety Management in Major Hazard Industries, Health and Safety Executive (February 2013)	Describes the core elements of the HID[2] Regulatory Model and the HID approach to the regulation and control of risk in onshore and offshore high hazard industries.
Control of Development in Airport Public Safety Zones, Department for Transport Circular 01/2010 (March, 2010)	Describes how development in the vicinity of airports will be controlled.

[2] Hazardous Installations Directorate

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Appendix 15.7
Proposed major accident and disaster harm criteria

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1. PROPOSED MAJOR ACCIDENT AND DISASTER HARM CRITERIA

1.1.1 Section 15.10 describes the method used to assess the magnitude of change based on severity of harm and duration of harm for non-human receptors and severity of harm and number of people affected for human receptors. This appendix contains more detail about criteria used to rank these parameters.

1.1.2 Criteria for the severity of harm, duration of harm and number of people affected outlined in Table 15.7.1, Table 15.7.2 and Table 15.7.3 respectively. These are aligned to and largely extracted from definitions used in commonly applied major hazard guidance for the environment (CDOIF Guideline Environmental Risk Tolerability for COMAH Establishments, V2) and risk tolerability criteria for people applied by the HSE (R2P2, 2001), CAA (CAP 795, 2015) and in the DfT PSZ circular.

1.1.3 Note 1: Some of the criteria used in the major accidents and disasters assessment are based on the area of a receptor that is affected. The CDOIF guidance notes that this is a relatively crude guide to the severity or long-term effects. The method includes consideration of the proportion of a linear feature or population that is affected as well as considerations under other categories such as particular species (the method requires that each applicable factor is considered). The level of harm will be assessed with input from relevant specialists.

1.1.4 Receptor sensitivity, which relates to the intrinsic value and/or sensitivity of receptors, is embedded within the 'severity of harm', 'duration of harm' and number of people affected criteria to establish their threshold levels and scaling factors. For this reason, the guidance on which Table 15.7.1 is based does not explicitly state sensitivity levels. Therefore, to assist understanding, sensitivity of receptor groups has been provided in Table 15.7.1 based on expert judgement. These are ranked as: very high, high, medium and low.

1.1.5 The environmental (non-human) criteria have been directly extracted from that of CDOIF guidance which sets a maximum or minimum severity ranking for some receptors. In the table, therefore some severity of harm categories are noted as non-applicable.

1.1.6 Severity of harm criteria also includes criteria for human population which is not provided in CDOIF guidance. This has therefore been developed and calibrated to align with HSE's R2P2, CAP 795 and the DfT PSZ circular.

1.1.7 In Table 15.7.1, the term 'noticeable' is used to refer to a level of harm that might lead to noticeable pollution or a minor impact on people, but one which is not considered to reach the thresholds of a major accident. In the CDOIF guidance,

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this column is referred to as 'significant' (rather than 'noticeable') but note that the proposed assessment methodology treats levels of harm in this bracket in the same manner as the CDOIF guidance. It has been renamed to 'noticeable' here to avoid confusion since significant has a different meaning within the Environmental Impact Assessment (EIA) context.

1.1.8 Note 1: Typically, other topics examine effects that do not meet the thresholds for major accidents and disasters, but are expected or likely to occur during the life of a development due to planned construction or operational activities.

1.1.9 Note 2: Major accidents and disasters examines effects resulting from unplanned but reasonably foreseeable events of high magnitude. They are unlikely to occur during the life of a development however should they occur; the consequences are so serious that their scrutiny during the planning process is warranted to ensure that a development is not vulnerable to them.

1.1.10 Note 3: The thresholds are proposed in the context of the assessment of effects arising from major accident or disaster only. Effects that are 'noticeable' are not insignificant and in fact, were they to occur on a frequent basis would be unacceptable and are assessed in other chapters, notably **Chapter 6: Biodiversity** if they are considered likely and foreseeable.

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Table 15.7.1 Severity of harm to the environment (relative to the receptor sensitivity)

Receptor Type	Receptor Sensitivity	Severity of harm			
		Noticeable	Severe	Large	Very Large
Human populations (public: local communities, visitors, passengers)	Very high	Small number of minor injury	Substantial number of people requiring medical attention	Multiple life changing injuries, potential loss of life in low numbers	Potential loss of life in high numbers and substantial number of life changing injuries
Human populations (airport and construction workers)	Very High	Substantial number of people requiring medical attention	Multiple life changing injuries	Multiple life changing injuries, potential loss of life in low numbers	Potential loss of life in high numbers and substantial number of life changing injuries
Designated Land/Water Sites (Internationally important)*	Very high	<0.5 ha or <5% (<5% LF/Pop)	>0.5 ha or 5-25% of site area or 5-25% of associated linear feature or population	25-50% of site area, associated linear feature or population	>50% of site area, associated linear feature or population
Designated Land/Water Sites (Nationally important)*	High	<0.5 ha or <10%	>0.5 ha or 10-50% of site area, associated linear feature or population	>50% of site area, associated linear feature population	N/A
Other Designated Land*	High	<10 ha or <10%	10-100 ha or 10-50% of land	>100 ha or >50% of land	N/A
Scarce Habitat*	Medium /High	<2 ha or <10%	2-20 ha or 10-50% of habitat	>20 ha or >50% of habitat	N/A
Widespread Habitat – Non-designated Land*	Medium	<10ha	Contamination of 10-100 ha of land, preventing growing of crops, grazing of domestic animals or	100 – 1000 ha (applied as per text under 'Severe')	>1000 ha (applied as per text under 'Severe')

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Receptor Type	Receptor Sensitivity	Severity of harm			
		Noticeable	Severe	Large	Very Large
			renders the area inaccessible to the public because of possible skin contact with dangerous substances. Alternatively, contamination of 10ha or more of vacant land.		
Widespread Habitat – Non-designated Water*	Medium	N/A	Contamination of aquatic habitat which prevents fishing or aquaculture or renders it inaccessible to the public.	N/A	N/A
Groundwater Source of Drinking Water*	Very high	Interruption of drinking water supply <1000 person-hours or For England & Wales only <1ha SPZ	Interruption of drinking water supplied from a ground or surface source (where persons affected x duration in hours [at least 2] >1,000) or For England & Wales only 1-10ha of SPZ where drinking water standards are breached	>1 x 10^7 person-hours interruption of drinking water (a town of ~100,000 people losing supply for month) or For England & Wales only 10-100ha SPZ drinking water standards breached	>1 x 10^9 person-hours interruption of drinking (~1 million people losing supply for 1 month) or For England & Wales only >100ha SPZ drinking water standards breached
Groundwater – non Drinking Water Source*	Medium / High	<1ha	1-100ha of aquifer where water quality standards are breached (or	100-10,000ha	>10,000ha

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Receptor Type	Receptor Sensitivity	Severity of harm			
		Noticeable	Severe	Large	Very Large
			hazardous substance is discernible)		
Groundwater in unproductive strata*	Low	Groundwater not a pathway to another receptor.		N/A	
Soil or sediment (i.e. as receptor rather than purely a pathway)*	Low / Medium	Contamination not leading to environmental damage (as per ELD), or not significantly, affecting overlying water quality.	Contamination of 10-100ha of land etc. as per Widespread Habitat; Contamination sufficient to be deemed environmental damage (Environmental Liability Directive)	Contamination of 100-1000ha of land, as per Widespread Habitat; Contamination rendering the soil immediately hazardous to humans (e.g. skin contact) or the living environment, but remediation available.	Contamination of >1000ha of land, as per Widespread Habitat; Contamination rendering the soil immediately hazardous to humans (e.g. skin contact) or the living environment and remediation difficult or impossible.
Built environment* (Under CDOIF guidance, built environment is limited to status at or above Grade 1/Cat A listed buildings, scheduled monuments and conservation areas)	Medium - Very high depending on the designation and nature	Damage below a level at which designation of importance would be withdrawn.	Damage sufficient for designation of importance to be withdrawn.	Feature of built environment subject to designation of importance entirely destroyed.	N/A
Particular species (Note – these criteria apply	Low - Very high (depending on species)	Loss of <1% of animal or <5% of plant ground cover in a habitat.	Loss of 1-10% of animal or 5-50% of plant ground cover.	Loss of 10-90% of animal or 50-90% of plant ground cover.	Total loss (>90%) of animal or plant ground cover.

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Receptor Type	Receptor Sensitivity	Severity of harm			
		Noticeable	Severe	Large	Very Large
nationally not regionally/locally)*					
Marine*	Medium	<2ha littoral or sub-littoral zone, <100ha of open sea benthic community, <100 dead sea birds (<500 gulls), <5 dead/significantly impaired sea mammals.	2-20ha littoral or sub-littoral zone, 100-1000ha of open sea benthic community, 100-1000 dead sea birds (500-5000 gulls), 5-50 dead/significantly impaired sea mammals.	20-200ha littoral or sub-littoral zone, 100-10,000ha of open sea benthic community, 1000-10,000 dead sea birds (5,000-50,000 gulls), 50-500 dead/significantly impaired sea mammals.	>200ha littoral and sub-littoral zone, >1000ha of open sea benthic community, >10000 dead sea birds (>50000 gulls), >500 dead/significantly impaired sea mammals.
Fresh and estuarine water habitats*	High	Impact below that indicated to be severe	WFD Chemical or ecological status lowered by one class for 2-10km of watercourse or 2-20ha or 10-50% area of estuaries or ponds. Plus interruption of drinking supplies, as per Groundwater Source of Drinking Water.	WFD Chemical ecological status lowered by one class for 10-200km of watercourse or 20-200ha or 50-90% area of estuaries and ponds. Plus interruption of drinking water supplies, as per Groundwater Source of Drinking Water.	WFD Chemical or ecological status lowered by one class for >200km of watercourse or >200ha or >90% area of estuaries and ponds. Plus interruption of drinking water supplies, as per Groundwater Source of Drinking Water.

* Criteria and Receptor types extracted directly from CDOIF Guidance Criteria [1]

[1] Chemical and downstream Oil Industries Forum. Guideline Environmental Tolerability for COMAH Establishments V2

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1.1.11 In Table 15.7.1, where two threshold parameters are given within a single category, for example <0.5 ha or 10% of a designated site of national importance, the lesser of the two is taken to be the threshold for a given receptor. This ensures there is no gap between the 'severity of harm' categories.

1.1.12 The duration of harm, which might also be considered as the recovery period, is also a factor in establishing criteria for the magnitude of change relating to major accidents and disasters on non-human receptors. This is given in Table 15.7.2.

1.1.13 In general terms a receptor which is able to recover quickly from an event is considered to have suffered a lesser level of harm and one which is more easily tolerated than one that does not recover, or recovers only after a very long time. This concept is recognised in the duration criteria, which takes account of the ability of the receptor to recover and the importance given to the receptor by society (i.e. its sensitivity). Duration criteria therefore differs by receptor type, and what is considered short term for one receptor type is not the same as that of another.

1.1.14 Four categories of duration are considered: short-term, medium-term, long-term and very long-term.

1.1.15 For environmental (non-human) receptor types, the criteria is taken directly from the CDOIF guidance, informed by guidance provided by the Energy Institute[2], for appropriate recovery times of different receptors types following exposure to various hazardous substances.

[2] Energy Institute, Guide to Predicting Environmental Recovery Durations form Major Accidents. Supporting Guide to the Environmental Risk Tolerability for COMAH Establishments Guideline, 2017

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Table 15.7.2 Duration of harm to the environment (non-human receptors)

Description*	Short term	Medium term	Long term	Very long term
Groundwater or surface water drinking water source (public or private)	N/A	N/A	Harm affecting drinking water source or SPZ <6 years	Harm affecting drinking water source or SPZ >6 years
Groundwater (except drinking water sources): WFD Hazardous/Non Hazardous Substances	WFD hazardous substances <3 months	WFD hazardous subs >3 months	WFD hazardous subs >6 years	WFD hazardous subs >20 years
	WFD non-hazardous substances <1year	WFD non-hazardous substances >1 year	WFD non-hazardous substances >10 years	WFD non-hazardous substances >20 years
Surface water (except drinking water sources - see above)	<1 year	>1 year	>10 years	>20 years
Land	<3 years	>3 years or >2 growing seasons for agricultural land	>20 years	>50 years
Built environment[3]	Can be repaired in <3 years, such that its designation can be reinstated.	Can be repaired in >3 years, such that its designation can be reinstated.	Feature destroyed, cannot be rebuilt, all features except world heritage site.	Feature destroyed, cannot be rebuilt, world heritage site

*Extracted directly from CDOIF[1] Guidance Criteria

1.1.16 For human receptors, the number of people affected is used in determining the magnitude of change. The assigned values are aligned to be compatible with R2P2, CAP795 and the DfT PSZ circular concepts and given in Table 15.7.3.

Table 15.7.3 Human populations: number of people affected

Description	Numbers affected	
Human populations	Low to high numbers affected (10s of people)	Very high number affected (100s of people)

[3] Not all descriptions in this row refer directly to duration. They are included here so that they are correctly calibrated within the Magnitude Matrix (Graphic 15.2).

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Appendix 16.1
Description of current aircraft operation

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1. DESCRIPTION OF CURRENT AIRCAFT OPERATION

1.1.1 This section describes the current operation of the airport in the context of aircraft noise. To accord with the revised draft Airports National Policy Statement (ANPS) changes may be required to these current operational parameters.

1.1.2 For safety and performance reasons aircraft typically land and take off into wind and therefore when there is a westerly wind, aircraft arrive over London and depart towards the west (known as westerly operations). When there is an easterly wind aircraft arrive over Windsor and depart towards London (known as easterly operations).

1.1.3 During the day, a 'westerly preference' also operates at Heathrow. Westerly preference is Government policy and means that even during periods of light easterly winds (up to 5 knots) aircraft will continue to land in a westerly direction, making their final approach over London. Westerly preference was introduced in the 1960s to reduce the number of aircraft taking off in an easterly direction over London, the most heavily populated side of the airport. This was when departures were considered to be more disruptive to local communities than arrivals.

1.1.4 In the UK, the wind is mostly from the south-west. When the prevailing wind direction and westerly preference are combined, the resulting pattern is that westerly operations typically occur for around 70% of the time and easterly operations for 30% of the time.

1.1.5 During the day, and when the airport is on westerly operations, a procedure known as 'runway alternation' is in place. This procedure provides local communities living under the final approach into the airport with periods of relief from aircraft noise. Residents place great importance on the alternation system at Heathrow and every effort is made to adhere to it. The runway alternation pattern means that for part of the day we use one runway for landings and the other for take-offs, then halfway through the airport's operating day at 15:00, the runways switch over.

1.1.6 In the morning one runway is used for take-offs and the other for landings. At 15:00 the runway switches over. This morning to evening pattern of runway use continues for the rest of the week and the following week the pattern switches. What happened during the evening during the previous week, now happens in the morning. And vice versa. This pattern is published for the year.

1.1.7 During the night when traffic volumes are lower, there is greater scope for alternating runway use whether the airport is on easterly or westerly operations. Landings can be switched between the northern and southern runways and, if the weather allows it, aircraft can approach from the east or the west.

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1.1.8 Those four options allow the Airport to operate night-time runway alternation on a four-weekly cycle around the northern and southern runways and easterly and westerly operations. Subject to the prevailing wind conditions, for one week aircraft arrive from the west on the northern runway, the following week arriving aircraft arrive from the east on the northern runway, the week after that, aircraft arrive from the west and land on the southern runway and on the final week aircraft arrive from the east and land on the southern runway. The pattern of rotation is published for the year. If the wind conditions prevent the planned runway from being used an alternative is also detailed in the runway rotation schedule.

1.1.9 Due to the volume of aircraft movements, arriving aircraft are frequently held in a 'holding stack'. There are four main holding stacks at Heathrow, known as Bovingdon to the north-west, Lambourne to the north-east, Biggin to the south-east and Ockham to the south-west. At any one a time a number of aircraft will be in each stack, separated by 1,000ft and each aircraft will fly a number of circuits until cleared by Air Traffic Control (ATC) to land. The lowest level of the stack is 7,000ft.

1.1.10 Aircraft enter the stack, circle and descend. When they leave the holding stack they are directed by ATC onto the final approach to land at Heathrow. The controllers manage the order of the aircraft from all four stacks and guide them safely onto one of Heathrow's two runways. There are no set routes for planes moving from the holding stacks to the final approach. While the overall patterns have remained similar for many years, the position of aircraft in the skies varies from flight to flight and day to day.

1.1.11 Once an aircraft has been directed out of a stack, a Continuous Descent Approach (CDA) is followed as far as practicable at the time, as the aircraft descends maintaining a steady angle to join the final approach. CDAs have been used at Heathrow for many years. The intention of CDA is to reduce arrival noise by keeping aircraft higher for longer. The specific CDA profile for Heathrow, as defined in the Arrivals Code of Practice, is a 3° descent from 6,000ft.

1.1.12 An aircraft is on its final approach when it is lined up with the runway to land. The final approaches into Heathrow's runways extend about 13 nautical miles (approximately 15 miles) from the end of each of the airports' two runways. The point at which aircraft join the final approach varies on a flight by flight basis depending on how aircraft need to be sequenced by the controllers.

1.1.13 Aircraft landing at Heathrow join the Instrument Landing System (ILS) to align directly with the runway. The ILS is a precision runway approach aid employing two radio beams to provide pilots with vertical and horizontal guidance during the final approach to landing. Pilots use it to guide them to the runway and down the 3º approach angle. Each runway has its own beam which is aligned with its

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centreline to ensure aircraft approach in a straight line as they come into land. These approach flight paths are fixed.

1.1.14 During the day, aircraft should join the final approach at a height of at least 2,500ft, and will then follow the ILS down a 3° glide path into the airport. During the night, aircraft must not be lower than 3,000ft or closer than 10 nautical miles when joining the ILS.

1.1.15 Aircraft taking off from Heathrow follow pre-defined routes known as Standard Instrument Departures (SIDs). The choice of SID used is decided by the airline and is predominately dictated by the destination of the aircraft. A SID includes a profile and a minimum rate of climb. It avoids obstacles (for example tall buildings, radio masts, high ground) and also avoid SIDs from other airports which means that they don't always follow the most direct route. The current SIDs are based upon the historic positioning of ground-based navigational aids.

1.1.16 Either side of the SID is a 1.5km corridor known as the Noise Preferential Route (NPR). Aircraft do not have to follow the centreline of the SID precisely, but are required to stay within the 3km wide NPR up to 4,000ft, unless directed off for safety or operational reasons. These corridors are necessary because aircraft perform differently and so there will be some variation as to where aircraft fly relative to the centreline of the SID. Once aircraft reach 4,000ft, NATS air traffic controllers can direct them from the SID on to a more direct heading towards their destination.

1.1.17 Aircraft departing Heathrow are required to maintain a climb gradient of at least 4% from 1,000ft to (no less than) 4,000ft.

1.1.18 There is no ban on night flights at Heathrow but since 1962, the Government has placed restrictions on them. The structure of the current night flying restrictions at Heathrow has been in place since October 2017. The Night Flight restrictions are part of the Government defined noise measures under the Civil Aviation Act 1982.

1.1.19 There are two time periods associated with night-time flying. The Night Restrictions Period from 23:00–07:00 defines the night-time period and places restrictions on the movement of the noisiest types of aircraft; and within that timeframe the period between 23:30–06:00 which is known as the Night Quota Period (NQP) which has limits on the number of movements and the types of aircraft that can operate. These limits are set by the Department for Transport.

1.1.20 The limits are set on a seasonal basis: summer and winter; Heathrow is currently limited to 5,800 night flights a year: 3,250 in the summer season and 2,550 in the winter season. Heathrow is also permitted to carry over up to 10% of the 'left over' movements from summer to winter, which means the winter season limits vary more than the summer limits. The summer season is defined using British

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Summer Time. Heathrow is not permitted to accumulate the carry-over from one year to the next.

1.1.21 As well as limits set on the number of movements during the night period, aircraft are classified into nine bands according to the amount of noise they make when taking off and landing. The noisier the aircraft, the higher the band it is placed in. These bands are called quota counts (QC).

1.1.22 Every aircraft is given a QC number between 0 and 16. Under the QC system, each aircraft type, including different versions of the same model, is assigned a QC according to its noise performance, separately for arrival and departure, as determined by the ICAO noise certification process. For example, a Boeing 737-800 is classified as QC/0.5 on arrival and as QC/0.5 or QC/1 on departure (depending on its maximum certificated take-off weight), whereas a much larger and older Boeing 747-200 will vary between QC/2 and QC/8 on arrival, and between QC/4 and QC/16 on departure, depending on engine fit and maximum take-off weight.

1.1.23 Across each season the number of QC points for each aircraft movement during the NQP are added up and the total must be within QC limit for that season. In July 2017, following public consultation, the Government announced their new five-year regime running from October 2017 to 2022. The new regime includes the reduction of the QC limit for Heathrow from 4,080 to 2,415 (winter) and from 5,100 to 2,735 (summer).

1.1.24 There are no departures scheduled to operate between 23:30 and 06:00 and there are, on average, around 16 aircraft scheduled to arrive each day 04:30 and 06:00. Heathrow operates a voluntary restriction on aircraft landing before 04:30 and there is a voluntary restriction on the scheduling of cargo movements between 23:00 and 06:00.

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Appendix 16.2
Noise expert review group

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1. NOISE EXPERT REVIEW GROUP

1.1 NERG members biographies

Stephen Turner, MA, MSc, HonFIOA [NERG Chair]

1.1.1 Stephen graduated in engineering from King's College, Cambridge and in applied acoustics from the University of London. He has worked in the field of noise, acoustics and vibration for over 40 years, including, for virtually all that period, the assessment and management of aviation noise. He has prepared and presented evidence at Public Inquiries into proposed airport expansions and has carried out many studies regarding the impact and effect of aviation noise for a wide range of clients including airport operators, local authorities and resident groups. He is a member of the European Commission's Noise Expert Group, the European Environment Agency's Expert Panel on Noise and is chair of the British Standards Institution Committee on Transportation Noise. He was a peer reviewer for the Department of Transport's Attitudes to Noise from Aviation Sources in England study, published in 2007 and for their study entitled Survey of Noise Attitudes: Aircraft Noise, published by the Civil Aviation Authority in 2017. Stephen was a technical adviser to the noise policy team at Defra and its predecessors for 15 years, including four years as a Civil Servant, ending in January 2015. He is now Director of his own independent consultancy, Stephen Turner Acoustics Limited. He was awarded the Noise Abatement Society's 50th Anniversary John Connell Award for *"making an outstanding contribution in commitment, influence and positive impact on addressing noise management issues"* and was made an Honorary Fellow of the Institute of Acoustics in 2012.

David Horrocks, BA, DMS, FRSPH, MCIEH, CEnvH, MIOA

1.1.2 David is an independent chartered environmental health practitioner. He qualified in 1976 and spent 16 years working as a practising environmental health officer in local government for Burnley BC, Stratford on Avon DC, Milton Keynes BC and LB Camden. His last position in local government was as Head of Environmental Health Services at Brentwood DC in Essex. In 1992 he set up his own consultancy practice and he specialises in environmental protection work including the control of environmental and occupational noise, the assessment of air quality and the investigation and resolution of statutory nuisances. Between 2000 and 2013 David worked as a specialist advisor to Network Rail on the Thameslink rail project. This involved preparing guidance documents on the Best Practicable Means of Controlling Noise, Vibration and Airborne Pollution from construction works. During 2013 David was a member of the Acoustic Review Group on the HS2 project providing a 'check and challenge' function on policies and procedures

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emerging from the project. Since1993 David has tutored on the Institute of Acoustics Diploma course and has been an examiner on the Regulation and Assessment of Noise specialist module since 2005. He is an accredited assessor for the Chartered Institute of Environmental Health's Assessment of Professional Development scheme. David has considerable experience in preparing expert reports and in presenting expert evidence at public inquiries and in criminal and civil court proceedings. In 2010, with the environmental law barrister John Pointing, he established the consultancy *Statutory Nuisance Solutions* (SNS) and has worked on a number of cases for business and local authority clients, including the provision of bespoke practical training courses. SNS currently provides specialist advice to Defra on matters relating to statutory nuisance.

Lisa Lavia MBA, FRSA, Affiliate of the IOA

1.1.3 Lisa is managing director of environmental NGO The Noise Abatement Society (NAS). In 2009 she founded and developed NAS' Soundscape programme. Her work has included a series of empirical research projects and memberships of/appointments to the: EU FP7 COST Action TD0804 on "Soundscapes of European Cities and Landscapes"; International Organization for Standardization (ISO) TC43/SC1/WG54 on "Perceptual Assessment of Soundscape Quality"; British Standards Institution EH 1/2 committee on "Transport Noise"; and EH 1/3 committee on "Residential and Industrial Noise". She is a University of Sheffield Industrial Research Fellow on Applied Soundscape; an Affiliate of the Institute of Acoustics; lead chapter author on "Applied Soundscape Practices" in "Soundscape and the Built Environment" (CRC Press, 2015); and "Non-Participant Observation Methods for Soundscape Design and Urban Planning" in "Perception-Driven Approaches to Urban Assessment and Design" (IGI Global, 2018). She carries out collaborative empirical research on the relationship between soundscape, wellbeing and peoples' objective and subjective response in context.

Stephen Stansfeld, MB, BS, PhD, MRCP, FRCPsych, Dr HC University of Gavle

1.1.4 Stephen Stansfeld is Emeritus Professor of Psychiatry in the Wolfson Institute of Preventive Medicine at Barts and the London School of Medicine, Queen Mary University of London. His research interests include the effects of the physical and social environment on mental health. He was Chair of the International Commission on the Biological Effects of Noise from 2008 to 2014 and directed the 7th Framework funded European Network on Noise and Health, involving 33 European partners to decide on priorities for new research on environmental noise and health. He directed the European 5th Framework funded RANCH Study on the effects of aircraft and road traffic noise on children's cognition and health. He currently chairs the World Health Organisation (WHO) Guidelines Development Group on the new guidelines for environmental noise. He carries out research on

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noise and health, working conditions and mental health and longitudinal studies of adolescent mental health.

1.2 NERG terms of reference

Aim

1.2.1 The aim of the NERG is to "*independently assure the scientific and policy robustness of the assessment and mitigation of sound, noise and vibration, including effects on health and quality of life (wellbeing), associated with Heathrow expansion"*.

Purpose

1.2.2 To review and challenge as appropriate the approach to sound, noise and vibration assessment, management, control, and policy matters.

1.2.3 The group will provide assurance to Heathrow, its consultants and DCO Project stakeholders regarding the quality and appropriateness of the proposed assessment and management of sound, noise and vibration.

1.2.4 The group is independent of Heathrow and its consultants and is not expected to:

1. Speak on behalf of Heathrow or its consultants
2. Support or object to any of Heathrow's current operations, practices or proposals, or any other specific expansion proposal or any potential intervention.

Function

1.2.5 To provide an independent and highly experienced perspective on the development of sound, noise and vibration assessment methods and criteria and proposals for effective management and control of sound, noise and vibration.

1.2.6 To have a focus on management and control of all sound, noise and vibration sources including aviation, construction, road and rail. The group will also provide professional guidance on community responses to all sources of sound, noise and vibration including effects on health and quality of life (wellbeing).

1.2.7 The NERG is not required to:

1. review or provide critique on assessment outputs or findings
2. review or comment on compensation claims.

1.2.8 The NERG is not an approval body and their advice does not relieve others of their technical or contractual responsibilities.

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Activities

1.2.9 The responsibilities of the NERG include, but are not limited to:

1. Attending and participating in meetings of the NERG which are expected to be held bimonthly (once every two months) or at more frequent intervals as may be required providing independent advice to the Heathrow Expansion Programme (HEP) Integrated Design Team (IDT) and Programme Client Team (PCT)) acting in accordance with its defined remit
2. Reviewing and agreeing written records of previous meetings at the start of each meeting
3. Considering issues of principle and practice relating to construction and operational sound, noise and vibration assessment, management, control, policy and planning matters particularly through the bimonthly meetings
4. As and when requested, providing and clearly articulating their most up to date understanding of the management and control of issues to be presented in the format agreed
5. Reviewing HEP sound, noise and vibration assessment scope and methodologies, significance criteria, mitigation options and other associated issues. Providing comments using the template provided by HEP, unless otherwise agreed
6. Providing, as appropriate, supporting evidence for the group's advice and recommendations upon submission
7. Reviewing key IDT deliverables including but not limited to methodology statements, significance criteria, etc., in advance of publication
8. Provide updates to the project and its consultants on relevant international developments, legal case studies, recent publications and emerging technologies relating to aviation, construction and operational sound, noise and vibration through relevant presentations, papers and reports or other written communication as and when considered to be relevant which Heathrow may make externally available to stakeholders and the public online or through the Development Consent Order (DCO) process (subject to copyright). Contribute to central repository relevant reference material as and when encountered.

Outputs

1.2.10 The principal outputs of the NERG are recommendations and best practice guidance to HEP on the approach taken to construction and operational sound,

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noise and vibration assessment, management, control, policy and planning matters.

Conduct

1.2.11 The group operates without prejudice to any local or political view and is expected to abide by the codes of practice set by relevant professional organisations and the spirit of Heathrow's purpose statement and values.

1.2.12 All group members will be required to sign and abide by a non-disclosure agreement.

1.2.13 The group will report on its activities to HEP as necessary to inform them of advice and recommendations.

1.2.14 The agenda and any relevant papers for the meeting will be circulated not less than three working days before a meeting except where this is unavoidable. Records of the meeting will be kept and made available to others on request.

Meetings

1.2.15 Meetings will be held as agreed by the participants having regard to the DCO application schedule as informed by other interfacing consent processes.

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Appendix 17.1
Surface Access Modelling

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1. SURFACE ACCESS MODELLING

1.1 Introduction

1.1.1 This technical appendix provides an overview of the approach Heathrow is adopting to the development of a surface access modelling suite for an expanded Heathrow Airport, to inform the assessment work required to accompany the Development Consent Order (DCO) application. It provides a summary of the work to date and outlines future stages of work that will be undertaken in support of the DCO application. It has been produced as background information for discussion and to inform understanding of work to date in relation to surface access modelling.

1.2 Surface access modelling tools

1.2.1 To assess the surface access impact of an expanded Heathrow Airport, a comprehensive programme of modelling and assessment is underway. This modelling will generate forecasts for future surface access demand for an expanded airport and test the impact of different measures on the allocation of this demand to different modes of transport. The modelling and analytical programme is the primary tool for demonstrating that the targets set out in the revised draft Airports National Policy Statement (revised draft ANPS) are capable of being met. The revised draft ANPS states that:

"The applicant should assess the implications of airport expansion on surface access network capacity using the WebTAG methodology stipulated in the Department for Transport guidance, or any successor to such methodology. The applicant should consult Highways England, Network Rail and highway and transport authorities, as appropriate, on the assessment and proposed mitigation measures. The assessment should distinguish between the construction and operational project stages for the development comprised in the application".

1.2.2 To model the surface access impacts of an expanded airport, Heathrow has developed a suite of forecasting tools. These models have been developed following WebTAG guidance and are specifically focussed on Heathrow Airport and its surface access impacts. A summary of the purpose and functionality of these models is given below:

1. Air passenger demands by mode and hour of the day are forecast using the London Airports Surface Access Model (LASAM) and the associated Time Period Model (TPM). LASAM has a 2016 base year which was the latest year for which a full Civil Aviation Authority (CAA) air passenger database was available

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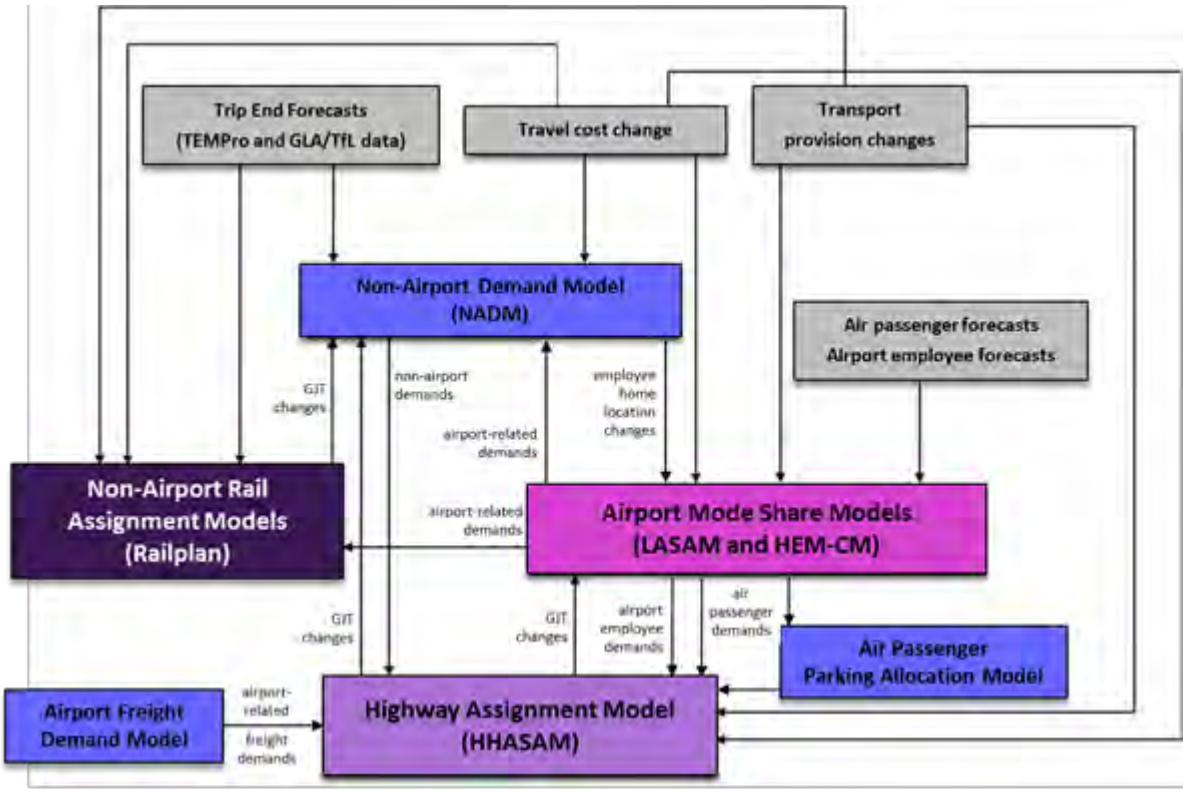
2. Airport employee demands by mode and hour of the day are forecast using the Heathrow Employee Mode Choice Model (HEM-CM). HEM-CM has a 2017 base year as the employee travel survey that forms the basis of the model was undertaken during 2017
3. Non-airport travel demands by mode and hour of the day are forecast using the Non-Airport Demand Model (NADM). NADM is calibrated to a 2015 base as this is the year for which most of the demand and traffic count data that are required for the model development was collected
4. Air passenger vehicle trips that are outputs from LASAM using the passengers' ultimate on-airport origin or destination are allocated to car parks using the parking allocation model
5. Airport-related freight demands are forecast by the Airport Freight Demand Model
6. Highway trips from the previous five models are assigned to the highway network using the Heathrow Highway Assignment and Surface Access Model (HHASAM). HHASAM is calibrated to a 2015 base as this is the year for which most of the demand and traffic count data that are required for the model development was collected
7. Non-airport travel demands by rail are forecast by a locally refined and validated version of Transport for London's (TfL) Railplan public transport assignment model. The basis of this is a 2015 scenario derived from LTS v7.1.2 which is being used as the base for initial forecasts. A further update to a Railplan 2015 base from v7.2 is planned.

1.2.3 Individual modules in the modelling suite currently have different base years which is a direct consequence of data availability. Processes will be used to adjust model outputs as appropriate where models need to interface with each other.

1.2.4 The new modelling suite and the interactions between the component models is shown Graphic 1.1.

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Graphic 1.1: Surface Access Modelling Suite



Source: Heathrow

1.3 Identifying the modelled area

1.3.1 The level of detail within a transport model varies by location. Models should be more detailed close to the scheme or intervention and become less detailed with increasing distance. This reduction in the level of detail should be graduated and not stark, commensurate with the requirements to ensure a good representation of routeing into the study area. The appropriate level of detail is mainly determined by the requirements of the highways assignment model, given that many of the environmental models depend directly on this component's outputs. The level of detail in the other model components in the suite has been adapted to support the highway assignment model requirements.

1.3.2 WebTAG notes that an evidence-based approach to the definition of the so-called 'Area of Detailed Modelling' and the 'Rest of the Fully Modelled Area' is to make use of an existing model where one is available. This involves undertaking initial high-level tests of the types of intervention that will be undertaken in the new model and for which the new model will be expected to provide a robust evidence base.

1.3.3 The purpose for which the highway assignment model will be used is very specific: for testing the impact of interventions (both demand and supply (network) based)

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at Heathrow Airport. This aids in the definition of the boundaries of these model area types. The geographic coverage of the highway assignment model needs to be sufficient that:

1. The strategic re-routeing impacts of interventions (either demand or network-based at the airport) can be modelled
2. Areas outside of the main study area, which are potential alternative diversions, are properly represented
3. The full lengths of trips are represented.

1.3.4 Analyses have been undertaken to understand the likely extents of impacts from surface access interventions at Heathrow airport. These analyses have made use of previous model runs of the pre-existing Regional Road Traffic Model (RRTM) highway assignment model. The spatial coverage of this model exceeds that likely required for Environmental Impact Assessment purposes, given that it was originally developed to also be able to assess surface access strategy impacts at Heathrow and Stansted. Additionally, checks on the distribution of employee home locations, distribution of sites flagged as potential impact locations in analysis undertaken by the Airports Commission and considerations of areas required by environmental teams have been noted.

1.3.5 Based on these analyses, the Fully Modelled Area (comprising the Area of Detailed Modelling and the Rest of the Fully Modelled Area) has been defined. These are shown in Figure 17.1 of **Chapter 17: Traffic and transport**. The geographical extents of these are based on the impacts predicted by the previous RRTM model discussed above, but aligned with London Borough and District boundaries.

1.3.6 The characteristics of each of the modelled areas are shown in Table 1.1.

Table 1.1 Fully modelled area identification

Area Type	Intervention Impacts	Characteristics
Fully Modelled Area, of which…		
… Area of Detailed Modelling	Significant impacts are certain at some locations within this area	1. All trip movements included 2. Small, detailed zones 3. High-level of network detail 4. Junction modelling (simulation coding)
… Rest of the Fully Modelled Area	Impacts are likely but weak in magnitude at some locations within this area	1. All trip movements included 2. More aggregate zones

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Area Type	Intervention Impacts	Characteristics
		3. Mixture of speed-flow curve modelling and key junctions.
External Area	Small to negligible impacts throughout this area	1. Skeletal coverage of rest of Great Britain 2. Large zones 3. Fixed speeds (for Variable Demand Model compatibility).

1.3.7 Definitions of 'significant' or 'weak' impacts are not given in WebTAG. It can be readily assumed that 'negligible' is defined as there being no change in flows between modelled scenarios or where changes are within the bounds of accuracy of the modelling platform or normal variation of traffic volumes.

1.3.8 The Guidance for Traffic Impact Assessment[1] notes that significant impacts to highway capacity may occur if:

1. Peak hour traffic flow increases by more than 10%; or
2. Peak hour traffic flow increases by more than 5% where the network is sensitive (i.e. where there is a congested road network).

1.3.9 Given that most of the network around Heathrow may be considered congested, the 5% rule has been applied to generate the Area of Detailed Modelling. The Rest of the Fully Modelled Area allows a graduated transfer to external area and also follows London Borough and District boundaries.

1.3.10 The modelling system and its components are being validated to WebTAG standards.

1.4 Air quality and noise requirements

1.4.1 The surface access modelling team is working with the air quality and noise teams to provide appropriate data to be input into their air quality and noise models. They will provide appropriate traffic and public transport data for the locations and time periods requested by the air quality and surface access teams, including average annual daily traffic (AADT) and annual average weekday traffic (AAWT) for required highway links.

1.4.2 The surface access modelling programme has been set up to be an iterative process to be responsive to the emerging surface access strategy and to take

[1] Institution of Highways and Transportation, 1994. Guidelines for Traffic Impact Assessment.

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account of incremental mitigation measures required to achieve the environmental objectives.

1.5 Assessment years

1.5.1 Heathrow is predicting that an expanded Heathrow Airport will be open by late 2026. For the purpose of future surface access modelling, Heathrow is using forecast years of 2030 and 2040, which align with the dates identified in the revised draft ANPS. Other future years, as required, will be derived from the 2015 base year and 2030 and 2040 forecast years through interpolation.

1.5.2 Background growth planned to occur in the catchment of Heathrow between now and 2030 and 2040 is being estimated using established data sources and in line with WebTAG. For London, this is derived from the new Draft London Plan published by the GLA in late 2017. For outside London, this is derived from National Trip End Model (NTEM).

1.6 Addressing uncertainty

1.6.1 All transport models, and forecasts based on them, are subject to uncertainty. The surface access modelling team aims to minimise uncertainty in their development and use of the transport modelling system as follows:

1. By following WebTAG best practice guidance in model development
2. By including a large new set of data which have been used to estimate the new models
3. By sensitivity testing of key inputs regarding external traffic growth assumptions, the surface access strategy and drivers of demand at Heathrow
4. By engaging key stakeholders in the definition of any alternative scenarios and their interpretation.

1.6.2 For example, forecasts for the future number of passengers at Heathrow who will use surface access networks are a combination of the following factors:

1. Total Air Traffic Movements (ATM) at Heathrow
2. Size and utilisation of aircraft at Heathrow
3. The proportion of transfer passengers.

1.6.3 For the purposes of developing the models, a range of possible passenger forecasts will be used ranging from 115 million passengers per annum (mppa) to 134 mppa. This takes into account a number of factors including:

1. Different assumptions on build up and utilisation of the new runway

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2. The delivery of terminal capacity alongside the runway capacity
3. The speed routes can be developed by existing airlines
4. Uptake by new airlines
5. Uncertainty regarding plane size.

1.6.4 As the airport expands and the number of services and destinations served by airlines operating at Heathrow increases, the catchment of passengers may also change. This could be a result of airlines relocating to Heathrow from other airports or the impact of new surface access connections, such as Crossrail. Assumptions on the future distribution of passengers are built in to the forecasting process.

1.6.5 The number of colleagues working at Heathrow relates to the number of passengers using the airport whilst taking into account technological and other changes that will impact on colleague numbers. The number of Heathrow-related colleagues today is around 76,000 and this is forecast to increase to 100,000 by 2030 and 120,000 by 2040.

1.6.6 Colleagues currently mostly reside in locations within close proximity to the airport, due to the lower journey times available for both car and public transport. With new public transport infrastructure, it is likely that the origin of colleague travel will cover a wider area as journey times improve for new locations made accessible from these new investments in transport. This potential change in the distribution of colleagues is built in to the forecasting process.

1.6.7 At this stage of the process, Heathrow has identified a possible range of passenger forecasts and different scenarios for the number of colleagues. These assumptions are subject to ongoing review and refinement as the proposals for expansion become more defined.

1.7 Next steps

1.7.1 The overall programme for modelling and analysis has been developed to align with the different stages of the DCO consultation and DCO application process.

1.7.2 The first phase of modelling and analysis has been undertaken with existing modelling tools to support Consultation 1 and to help define the overall approach to meeting the NPS requirements and commitments set out by Heathrow.

1.7.3 The second phase will involve more detailed testing and modelling of scenarios using emerging versions of the new modelling system and its components, reflecting comments received from the first consultation phase and supporting the preparation of the draft surface access strategy and preliminary environmental information report for Consultation 2.

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1.7.4 The final phase allows for comments from Consultation 2 to be incorporated and includes the testing of the final surface access strategy to be submitted with the DCO application, using the final, WebTAG compliant models and informing the Environmental Statement and Transport Assessment.

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Appendix 18.1
Water Framework Directive Compliance Assessment methodology

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Water Framework Directive Compliance Assessment methodology

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Document change history

Version	Date	Summary of changes
0.1	December 2017	First outline draft
0.2	February 2018	Amendments following initial discussions and incorporation of WFD detailed assessment method following 24/1/2018 meeting with EA.

Stakeholders

Name	Role
Environment Agency	Competent Authority for the WFD in England

Approved: Name: [redacted]

Role: TO5.3 Natural Environment Workstream Lead

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1. Introduction

1.1. The Project

1.1.1. This document relates to the Heathrow Expansion Project (the Project), being taken forward by Heathrow. The Project comprises a new runway and associated infrastructure to the north of and adjacent to the existing Heathrow airport. The Project would intersect several watercourses located close to Heathrow and the M25. In addition, the Project would also include ancillary and other developments to support the construction and operational phases.

1.1.2. As a Nationally Significant Infrastructure Project (NSIP)[1], the Project would be subject to an application for a Development Consent Order (DCO) under the Planning Act 2008. Among other permissions, it would also require environmental permits under the Environmental Permitting Regulations 2010 (EPR) for various activities that interact with the water environment.

1.2. Overview

1.2.1. The Water Framework Directive (WFD)[2] has been in force since 2000. It was transposed into UK law in 2003[3], which was most recently amended in 2017[4]. The WFD aims to protect and enhance the quality of the water environment across all European Union (EU) Member States. It takes a holistic approach to the sustainable management of water by considering surface water, groundwater and water-dependent ecosystems and their interactions. This uses the Driver-Pressure-Status-Indicator-Response (DPSIR) model to link broad policy/sectoral drivers and pressures to environmental outcomes, and the development of mitigation measures.

1.2.2. In order to ensure that the Project complies with the requirements of the WFD, it is subject to a WFD compliance assessment. This will provide a decision making tool to enable permitting authorities to assure themselves that the Project is compliant with the WFD or, if the development will compromise the objectives of the WFD, that the appropriate steps have been taken and information provided to justify authorising the Project under Article 4.7 of the WFD.

1.3. Aims of this report

1.3.1. This report presents the proposed process through which the WFD compliance assessment for the Project will be undertaken. The approach presented has been discussed with the Environment Agency at four consultation meetings on 25th May 2017, 19th July, 20th September 2017 and 24th January 2018.

[1] As defined in Part 3 of the Planning Act 2008 (as amended).
[2] EU Water Framework Directive: Directive 2000/60/EC of the European Parliament and of the Council; of 23 October 2000; Establishing a framework for Community action in the field of water policy.
[3] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003.
[4] Water Environment (Water Framework Directive) (England and Wales) Regulations 2017

2. The Water Framework Directive

2.1. Headline aims of the WFD

2.1.1. The Directive aims to protect and enhance the quality of the water environment across all European Union (EU) Member States. It takes a holistic approach to the sustainable management of water by considering surface water, groundwater and water-dependent ecosystems and their interactions. In order to achieve these aims, the objectives of the WFD, as implemented through the UK Government's Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 are as follows:

1. To prevent deterioration of the status of water bodies
2. To protect, enhance and restore all water bodies with the aim of achieving 'good status' by 2015[5]
3. To progressively reduce or phase out the release of individual pollutants or groups of pollutants and cease or phase out emissions, discharges and losses of priority hazardous substances
4. To prevent or limit the entry of pollutants to groundwater
5. To comply with the requirements of all WFD Protected Areas.

2.2. Spatial scale

2.2.1. Under the WFD, the surface water environment (rivers, lakes, estuaries and coastal waters) is organised into a catchment hierarchy, where the basic spatial management units are water bodies. Surface water bodies are grouped into larger operational catchments, which are used to identify packages of measures that can be applied to the water bodies within common hydrological catchments and/or characteristics. These are in turn comprised within management catchments of a scale appropriate for management and planning. The largest management unit is the River Basin District (RBD), which comprises one or more management catchments and is the main unit for management of river basins under the WFD. River Basin Management Plans (RBMPs) are developed within each RBD by the EU Member States and environmental objectives are set. The RBMPs are produced every six years, in accordance with the river basin management planning cycle.

2.2.2. Groundwater bodies are defined as distinct volumes of groundwater within an aquifer or aquifers. They are not spatially contiguous with the boundaries of surface water catchments.

2.3. Classification

2.3.1. The WFD requires all EU Member States to classify the current condition or 'status' of all surface water and groundwater bodies and to set a series of

[5] Although the WFD states that good status should be achieved by 2015, the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 stipulate that good status should be achieved by 2021 or, in relation to water quality in respect of some priority substances, 2027.

environmental objectives for maintaining or improving conditions so that water bodies maintain or reach 'good status'. These classifications are updated every six years, and are reported in the RBMPs.

2.3.2. The overall 'Ecological Status' of a water body is established on the basis of specific criteria and standards, which define the range of environmental conditions that support 'healthy' aquatic life and are applied in order to help the classification of water body status and the setting of status objectives via the RBMP process.

2.3.3. For surface waters, overall WFD status is made up of an ecological and a chemical component. Ecological status is measured on the scale of high, good, moderate, poor and bad. Chemical status is measured as good or fail. Good ecological status (GES) is defined as a slight variation from undisturbed natural conditions, with minimal distortion arising from human activity. The ecological status of water bodies is determined by examining biological elements (e.g. fish, invertebrates, plants) and a number of supporting elements and conditions, including physico-chemical, and hydromorphological factors.

2.3.4. The current status and measures designed to achieve the water body objectives (i.e. 2021 status and 2027 status) are set out for each RBMP prepared by the Environment Agency every six years. In the case of the Project, the relevant RBMP is the Thames RBMP.

2.3.5. The first RBMPs were published in 2009, and the second cycle RBMPs were published in February 2016. The plans provide the baseline condition of the water environment at the time of publication, set out the reasons why relevant water bodies are not achieving good status, and indicate the measures needed to get to good ecological status or potential. The third cycle RBMPs are set to be published at the end of 2021.

2.3.6. Where water bodies are not able to achieve GES because they have been substantially modified to enable a specified human use, such as water supply, flood protection or navigation, the water body may be designated as a heavily modified water body (HMWB) or, in the case of water bodies created entirely by human activity, an artificial water body (AWB). In both cases, WFD ecological objectives are measured against ecological 'potential', rather than ecological status (i.e. the aim is to achieve Good Ecological Potential (GEP) rather than GES). This means that the ecology must be as close as possible to that of a similar natural water body, but without compromising its human use. In practice, GEP is assessed by considering whether the mitigation measures (i.e. those measures that are necessary to ensure the hydromorphological characteristics of the water body are capable of supporting the best possible ecology) have been implemented. The Mitigation Measures required for each HMWB or AWB are listed in the RBMP. All measures listed must be implemented for the water body to achieve GEP. If the measures are not all implemented then the water body will only be able to attain, at best, moderate ecological potential (MEP). All quality elements that are not sensitive to the human use of the water body must

still attain a standard that is consistent with good status, in order for the water body to achieve GEP.

2.3.7. For groundwater bodies, good status has a quantitative and a chemical component. Both are measured on a scale of good, moderate or poor, and a confidence rating is assigned to the status assessment of high or low. Together, these provide a single final classification of either good or poor status. There is also a trend objective (under Article 7 of the WFD) set for groundwater water bodies where environmentally significant and sustained rising trends in pollutant concentrations need to be identified along with a definition of the starting point (percentage of level or concentration) for trend reversal. Furthermore, the daughter directive of the WFD specifically concerning groundwater (the Groundwater Directive[6] (GWD)) also requires the prevention of any input of priority substances and limiting (or control) of the input of all other substances to groundwater to prevent the deterioration of status.

2.4. Compliance with the WFD

2.4.1. All new activities that may have a likely impact[7] on the water environment are required to comply with objectives of the WFD as set out in section 2.1 of this report. This includes ensuring that no changes occur that cause a deterioration of current status of a water body, and that the activity does not prevent the achievement of the future status objectives of a water body.

2.4.2. For Nationally Significant Infrastructure Projects (NSIPs) such as the Project, the Planning Inspectorate has produced specific guidance to ensure that WFD compliance is appropriately assessed. In short, the Examining Authority for a Nationally Significant Infrastructure Project (NSIP) will need, by the close of the Examination, to be in a position to report to the Secretary of State (SoS) on the effects of the Project on the relevant RBMP (and the water bodies therein). This will be achieved through the submission of a WFD Compliance Assessment as part of the DCO application.

2.4.3. Water body status deterioration can occur by deterioration of any of the quality elements that make up overall status (e.g. biological, physicochemical or hydromorphological elements for surface waters). Accordingly, any activity that is part of the Project and is judged to have the potential to lower the status of any of the quality elements of a water body or preclude the measures necessary to achieve good status must be assessed to determine its compliance with the WFD. Furthermore, a ruling by the European Union Court of Justice on 1st July 2015[8] judged that deterioration of any individual quality

[6] Groundwater (Water Framework Directive) (England) Direction 2016

[7] Whilst the term 'effect' is commonly used in EIA, 'impact' is used throughout this report in order to be consistent with EA and PINS guidance and because it is a more familiar term for a WFD stakeholder audience.

[8] Court of Justice of the European Union, PRESS RELEASE No 74/15, The obligations laid down by the Water Framework Directive concerning enhancement and prevention of deterioration apply to individual projects such as the deepening of a navigable river, July 2015

elements will be considered as an overall deterioration even where this does not lead to a lowering of the overall WFD status of the water body.

Protected Areas

2.4.4. Water bodies may also be designated under Article 6 of the WFD as protected areas. Such areas that are relevant to the Project include:

1. Areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC) (i.e. Special Areas of Conservation [SAC] and Special Protection Areas [SPA]), as well as groundwater dependent terrestrial ecosystems (GWDTE).
2. Drinking water protected areas (DrWPA) to protect waters used for abstraction of drinking water (average abstraction of >10 m^3/d or serving >50 people).
3. Nutrient-sensitive areas, including areas designated as vulnerable zones under the Nitrates Directive (91/676/EEC) and areas designated as sensitive areas under the Urban Waste Water Treatment Directive (91/271/EEC) (UWWTD).

2.4.5. Such areas are likely to be subject to more stringent and/or additional standards in order to meet the requirements of the WFD. Developments that do not comply with the standards and objectives applying to the protected areas noted above will not be compliant with the WFD unless the tests for overriding public interest under Article 6.4 of the Habitats Directive (92/43/EEC) are met.

2.5. Consenting and the WFD

2.5.1. In order to ensure that the Project complies with the requirements of the WFD, the likely impacts of all of the activities required to construct and operate the Project will be assessed in a WFD Compliance Assessment document. This will provide a decision making tool to enable the relevant authorities to assure themselves that a proposed development is compliant with the WFD or, if the development will compromise compliance, that the appropriate steps have been taken and information provided to justify permitting the development under Article 4.7 of the WFD.

2.5.2. In England, responsibility for ensuring that the WFD is implemented, as well as the preparation of RBMPs, lies with the Secretary of State and the Environment Agency. The Environment Agency is also the relevant permitting authority in relation to its role in issuing Environmental Permits under the Environmental Permitting (England and Wales) Regulations 2016. Furthermore, all public bodies have a duty to ‘have regard’ to the relevant RBMP in exercising their functions, thus contributing to the UK, as an EU member state, complying with the WFD. Public Bodies include, for example, the Lead Local Flood Authorities

(LLFAs) responsible for Land Drainage Consenting in Ordinary Watercourses[9] within and adjacent to the Project, something which may be incorporated in the DCO process. As such, the Planning Inspectorate, in examining the DCO application, and the Secretary of State, in determining the DCO application, will need to have regard to the RBMP. Paragraph 5.182 of the revised draft Airports National Policy Statement sets out the expectation that:

"The Secretary of State will need to be satisfied that a proposal has had regard to the Thames river basin management plan and the Water Framework Directive and its daughter Directives, including those on priority substances and groundwater. In terms of Water Framework Directive compliance, the overall aim of development should be no deterioration of ecological status in watercourses, ensuring that Article 4.7 of the Water Framework Directive Regulations does not need to be applied. If Article 4.7 does need to be applied, and the conditions set out apply to airport development, the applicant must set out and report any modifications to the physical characteristics of surface water bodies or alterations to levels of groundwater bodies in the Thames river basin management plan."

2.5.3.

3. WFD assessment process

3.1. Overview

3.1.1. The stages of undertaking a WFD assessment, have been suggested by the Planning Inspectorate in Advice Note 18[10]. Broadly, these stages comprise the following steps:

1. Data collection on the Project design and the WFD baseline of the water bodies that are likely to be impacted
4. Screening of Project activities for WFD risk
5. Detailed WFD assessment, as informed by consultation with regulators
6. If the detailed WFD assessment is unable to demonstrate that the Project is compliant with the relevant parts of the WFD, then a case would need to be complied for an Article 4.7 derogation.

3.1.2. However, in practice, undertaking a WFD assessment is not a completely stepwise process. Several stages develop in parallel and there is feedback to other parts of the process. For example, on large infrastructure projects design options appraisal is commonly undertaken in an iterative manner in order to ensure that WFD is placed at the heart of the design decision making process. This is certainly the case in respect of the Project, meaning that there will be a 'background' level of screening, scoping and detailed assessment on design

[10] Planning Inspectorate Advice Note 18 on Water Framework Directive: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/06/advice_note_18.pdf

evaluation options before the final design is selected. Although this iterative evaluation will take place during the design process, the WFD assessment submitted with the DCO application will be based on the DCO design only. A separate report will be provided to document the audit trail of considerations that have influenced the evolution of the design.

3.1.3. The assessment will consider the whole design of the Project, including both construction and operational activities. Impacts associated with construction, such as those associated with wastewater management and storage of materials, the temporary footprint associated with construction compounds and storage areas and other general construction activities, will be assessed alongside the impacts from the operation of the Project following completion.

3.2. Available guidance to support the assessment process

3.2.1. In the absence of any specific or prescribed regulatory process to follow for WFD assessments, the Planning Inspectorate Advice Note 18 aims to reduce ambiguity and provide a template for a consistent approach across all NSIPs. The WFD assessment for the Project will follow the approach suggested by the Planning Inspectorate, including the high-level principles on undertaking the screening, scoping and detailed assessment stages.

3.2.2. In addition to Planning Inspectorate Advice Note 18, and specifically in respect of screening activities that have the potential to impact river water bodies, the Environment Agency have shared their internal guidance, referred to as 'Position 488_10'[11], alongside its accompanying Technical Guidance 488_10 SD03 to SD08.

4. WFD Assessment Area

4.1. Context

4.1.1. The WFD Assessment Area (a replacement term for what is described by PINS as the 'Zone of Influence') cannot be determined at this stage in the absence of an application site boundary for the Project. However, using the indicative project extent shown in Figure 3.1 of the scoping report, it is possible to provide an indicative Assessment Area. The final Assessment Area for use in the WFD assessment will depend on the outcome of the design of the Project; as such, water bodies may be added or removed relative to those presented in this report.

4.1.2. The spatial scope of the assessment will include all WFD surface water and groundwater bodies that are likely to be affected by the Project, including the new airport runway and all related works and infrastructure. At this time, all surface and groundwater bodies within the footprint of the Airports Commission red line boundary, including immediately adjacent and water bodies within a

[11] Environment Agency Position, 488_10: Protecting and improving the water environment - Water Framework Directive compliance of physical works in rivers, 2015.

reasonable distance downstream, form the indicative Assessment Area. These water bodies are listed in Table 18.1.1 and shown in 5.1 to 5-3. It is expected that a number of these water bodies will be scoped out as more details about the design and extent of the main and ancillary works are defined. However, when the Assessment Area is finalised, a full justification for all water bodies screened in/out of the assessment will be provided.

4.1.3. It should be noted that out of the 25 water bodies within the indicative Assessment Area only one, the Lower Thames Gravels groundwater body, is currently attaining good overall status. Furthermore, of the 25 water bodies, 18 are either artificial or heavily modified.

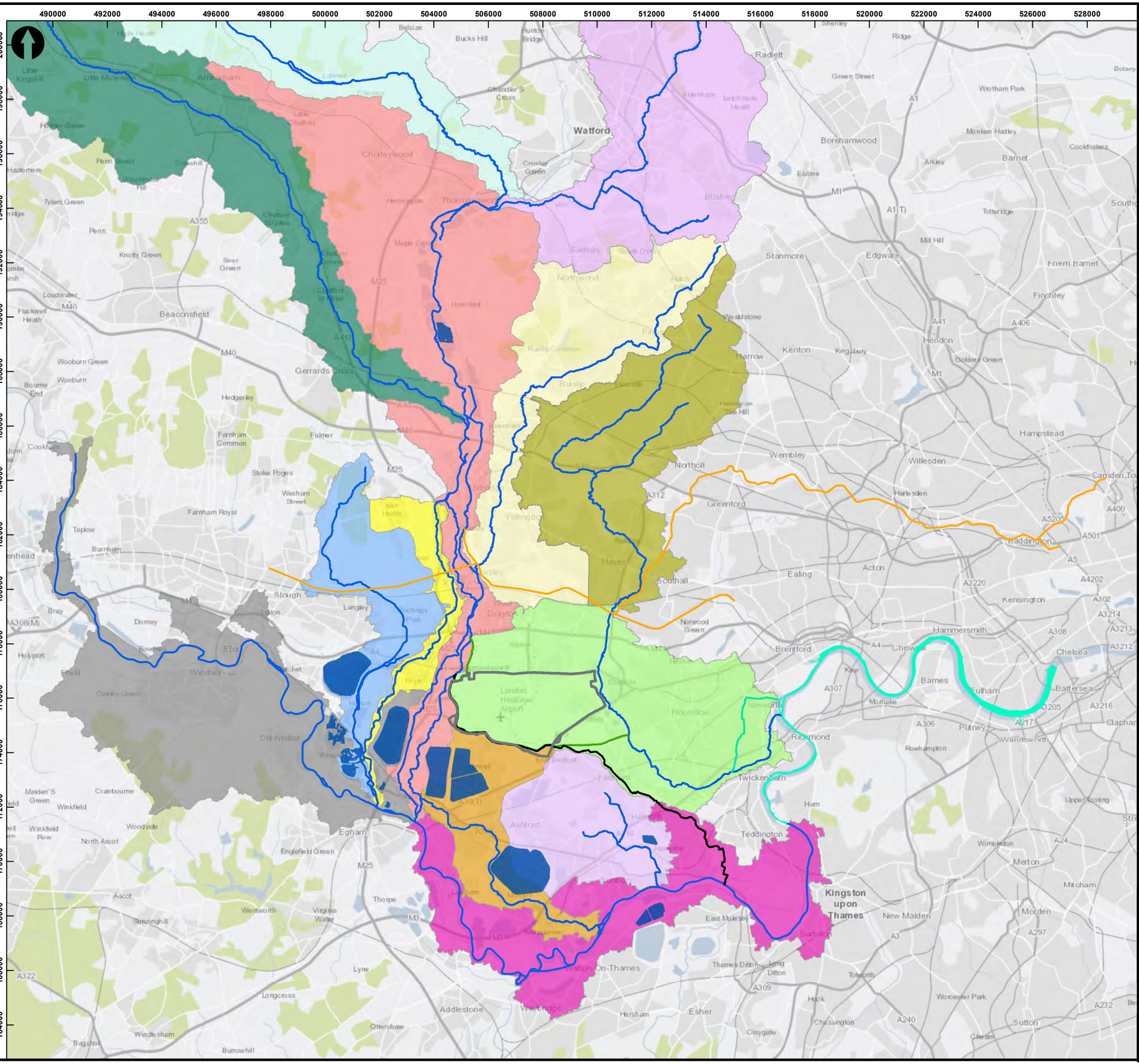
4.2. WFD water bodies in the indicative Assessment Area

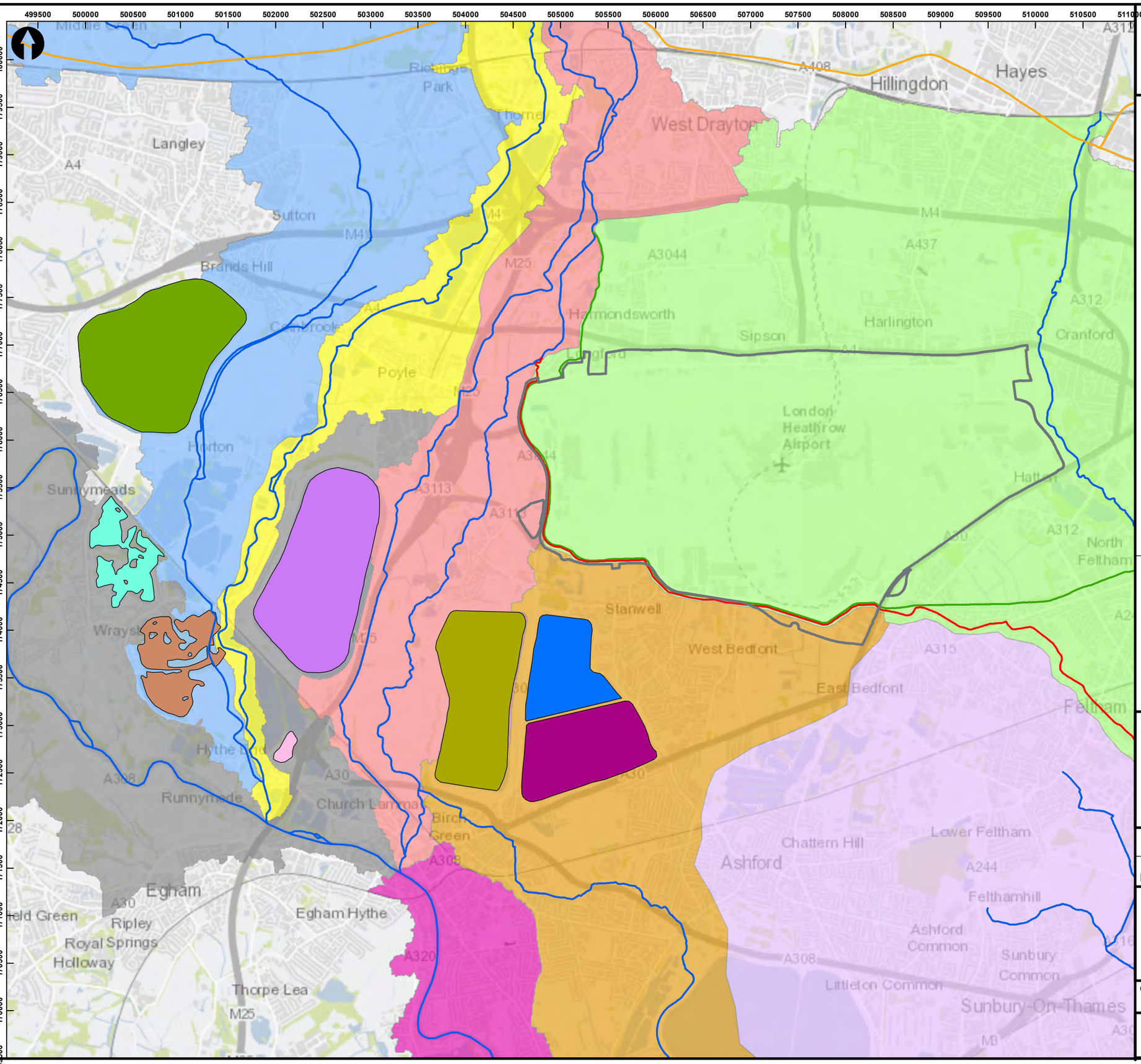
4.2.1. Figure 18.1.1 shows the catchment extents of all WFD surface water bodies in the indicative Assessment Area. Figure18.1.2 presents a zoomed in map showing those river water body catchments and the lake water bodies that fall within these catchments. Figure 18.1.3 shows the extent of the only WFD groundwater body within the indicative Assessment Area.

Table 18.1.1 WFD water bodies identified in the indicative Assessment Area.

Water body name	Type	Hydromorphological designation	Current overall status
Colne (conf with Chess to R Thames)	River	Heavily Modified	Moderate
Colne (from Confluence with Ver to Gade)	River	-	Moderate
Chess	River	-	Moderate
Misbourne	River	-	Moderate
Pinn	River	Heavily Modified	Moderate
Ver	River	-	Moderate
Gade (conf with Bulbourne to Chess)	River	Heavily Modified	Poor
Colne Brook	River	Heavily Modified	Moderate
Horton Brook	River	-	Moderate
Yeading Brook	River	Heavily Modified	Moderate
Crane	River	-	Poor
Portlane Brook	River	Heavily Modified	Moderate
Surrey Ash	River	Heavily Modified	Moderate
Thames (Cookham to Egham	River	Heavily Modified	Moderate
Thames (Egham to Teddington)	River	Heavily Modified	Poor
Upper Duke of Northumberland's River	Surface water transfer	Artificial	Moderate

Water body name	Type	Hydromorphological designation	Current overall status
Longford River	Surface water transfer	Artificial	Moderate
Lower Duke of Northumberland's River	Surface water transfer	Artificial	Moderate
Grand Union Canal (Grand Union Canal (Uxbridge to Hanwell Locks, Slough Arm, Paddington Arm)	Surface water transfer	Artificial	Moderate
Lower Thames Gravels	Groundwater	-	Good
Heron Lake	Lake	Artificial	Moderate
King George VI Reservoir	Lake	Artificial	Moderate
Staines Reservoir North	Lake	Artificial	Moderate
Staines Reservoir South	Lake	Artificial	Moderate
The Queen Mother Reservoir	Lake	Artificial	Moderate
Wraysbury Lake	Lake	Artificial	Poor
Wraysbury No 2	Lake	Artificial	Moderate
Wraysbury Reservoir	Lake	Artificial	Moderate


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Watford
Chorleywood
Rickmansworth
Amersham
Beaconsfield
Gerrards Cross
Slough
Windsor
Egham
Staines
Heathrow
Hounslow
Uxbridge
Harrow
Wembley
Hillingdon
Greenford
Northolt
Ruislip
Northwood
Stanmore
Edgware
Borehamwood
Radlett
Kingston upon Thames
Richmond
Twickenham
Teddington
Ham
Ashford
Chertsey
Weybridge
Walton-On-Thames
Esher
Hersham
Addlestone
Ottershaw
Chobham
Bagshot
Windlesham
Virginia Water
Wentworth
Ascot
Sunninghill
Englefield Green
North Ascot
Winkfield
Cranbourne
Maiden'S Green
Old Windsor
Datchet
Eton
Bray
Maidenhead
Cookham
Marlow
Taplow
Burnham
Farnham Royal
Stoke Poges
Farnham Common
Hedgerley
Wooburn
Wooburn Green
Bourne End
Flackwell Heath
Loudwater
Penn
Tylers Green
Hazlemere
Holmer Green
Little Missenden
Little Kingshill
Chesham
Belsize
Bucks Hill
Chandler'S Cross
Croxley Green
Rickmansworth
Chalfont St Giles
Chalfont St Peter
Gerrards Cross
Denham
Uxbridge
Hillingdon
Yiewsley
West Drayton
Iver
Iver Heath
Langley
Slough
Datchet
Windsor
Old Windsor
Wraysbury
Staines
Ashford
Feltham
Hanworth
Whitton
Twickenham
Isleworth
Brentford
Chiswick
Kew
Barnes
Mortlake
Richmond
Putney
Roehampton
Fulham
Chelsea
Battersea
Wandsworth
Clapham
Kensington
Hammersmith
Acton
Ealing
Southall
Norwood Green
Hayes
Harlington
Harlington
Harlington



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- Heathrow Planning Boundary
- WFD River Water Bodies

WFD Canal and Surface Water Transfer Water Bodies

- GU Canal, Uxbridge to Hanwell Locks
- Longford River
- Lower Duke of Northumberland's River
- Upper Duke of Northumberland's River

WFD Lake Water Bodies

- Heron Lake
- King George VI Reservoir
- Staines Reservoir North
- Staines Reservoir South
- The Queen Mother Reservoir
- Wraysbury Lake
- Wraysbury No 2
- Wraysbury Reservoir

WFD River Water Body Catchments

- Colne (Confluence with Chess to River Thames)
- Colne Brook
- Crane
- Horton Brook
- Portlane Brook
- Surrey Ash
- Thames (Cookham to Egham)
- Thames (Egham to Teddington)

0 200 400 800 1,200 1,600 2,000 2,400 Metres

Scale 1:40,000

Heathrow

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Scale	
1:40,000	

Project Name	Heathrow Project No.
Heathrow Expansion Project	HEP53

Title

Figure 18.1.2: WFD surface water bodies

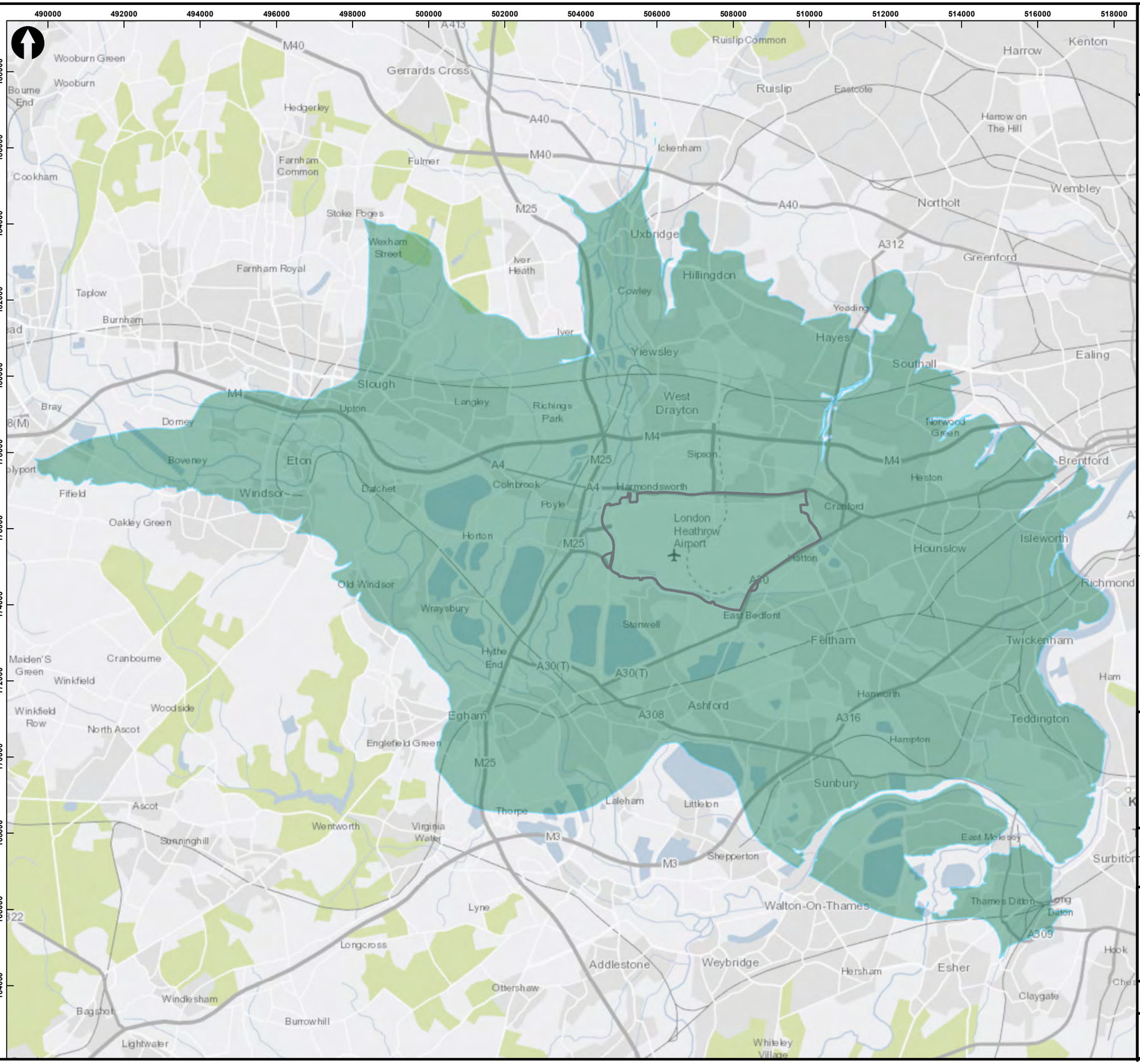
Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	GREES	WHITG	10/05/2018	FINAL

Location-Level-Sub Series/System-Identifier	Version
HEP53-XX-GA-XXX-000156	1.0

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Heathrow Planning Boundary

Lower Thames Gravels WFD Groundwater Body

0 500 1,000 2,000 3,000 4,000 5,000 6,000
Metres

Scale 1:100,000

Heathrow

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Scale	Project Name	Heathrow Project No.
1:100,000	Heathrow Expansion Project	HEP53

Title

Figure 18.1.3: Lower Thames Gravels WFD groundwater body

Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	GREES	WHITG	10/05/2018	FINAL

Location-Level-Sub Series/System-Identifier	Version
HEP53-XX-GA-XXX-000157	1.0

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5. Step 1: Data collation to support the WFD assessment

5.1. Data collation – Project details

5.1.1. This stage will establish the nature of the proposed works, with regards to identifying the activities associated with the Project that would potentially impact WFD surface water and groundwater bodies. This includes the spatial footprint of the various activities, including any specific construction techniques or operational activities that would need to take place to support the presence of a design element, and the timescales and phasing involved in construction. From this point forward, these will collectively be referred to as 'activities'.

5.1.2. Any relevant mitigation embedded within the Project design will also be identified. All elements of the design will be considered in the screening stage, including construction and operational activities.

5.2. Data collation – WFD baseline

5.2.1. The objective of the WFD baseline data collation is to establish the baseline condition of the water bodies within the Assessment Area in order to provide a robust understanding of their characteristics, function and interactions. This will inform the assessment of likely risks to the water bodies from the different elements of the Project, identify any future changes to the baseline, and help to indicate appropriate mitigation. The information required to establish the WFD water body baseline will be collated through both desktop and a field-based assessment.

Desk-based assessment

5.2.2. The objective of the WFD desk study is to collate and review the available environmental baseline information in relation to the WFD surface water and groundwater bodies that are likely to be affected by the Project. This information has been obtained from the Environment Agency, and other stakeholders.

5.2.3. The water body status and status objectives information for the relevant WFD water bodies in the Assessment Area have been derived from the Thames RBMP (2016 Cycle 2 Water Body Status Classification data[12]). These data are considered to provide the formal baseline against which the Environment Agency would assess compliance with the WFD.

5.2.4. Other datasets that will be used to further establish the nature and existing condition of those watercourses located within WFD water bodies included in the Assessment Area are listed in

[12] Environment Agency (2015), River Basin Management Plan *Thames River Basin District*, https://www.gov.uk/government/collections/river-basin-management-plans-2015#thames-river-basin-district-rbmp:-2015

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5.2.5. Table 18.1.2.

Table 18.1.2 Data sources to inform the WFD assessment, and purpose

Data / Source	Purpose
Ordnance survey (OS) mapping	OS mapping will be used to understand the spatial context of the water bodies and the interactions within the water environment. OS mapping will also be used as the base to collect spatial data in the field and to display baseline data. OS maps can also provide relevant information regarding locations of abstractions.
Historical OS mapping[13]	Historical OS mapping will be used to identify past changes in the location of watercourses and water body catchments, and understand the context of their current conditions
Aerial photography[14]	Assessment of the aerial photographs will help to characterise current conditions, especially in terms of riparian vegetation, and will inform the field survey strategy.
Protected Areas[15]	This information will be used to identify European Protected Areas that could be affected by the proposed works and subsequently inform the field survey strategy.
Digital River Network (DRN) (Environment Agency)	The DRN, together with the OS, will be used to understand the spatial context of the water bodies and the interactions within the water environment and with other systems.
River gauge data (NRFA)[16]	These data will provide information regarding the nature of flows in the different river water bodies
River Catchment characteristics (FEH, CEH)[17]	These data will provide relevant information regarding the nature of the different river water body catchments and inform low-flow calculations
Bedrock and superficial geology (BGS)	These data will provide relevant information regarding the nature of the different surface and groundwater bodies and potential geological controls

[13] Historical OS mapping http://maps.nls.uk; www.old-maps.co.uk (accessed 03 May 2018)
[14] Aerial photography http://www.google.co.uk/maps; http://www.bing.com/maps (accessed 03 May 2018)
[15] DEFRA Protected areas http://magic.defra.gov.uk/MagicMap.aspx (accessed 03 May 2018)
[16] National River Flow Archive, available at http://nrfa.ceh.ac.uk/data/station (accessed 03 May 2018)
[17] Flood Estimation Handbook, CEH, available at http://www.ceh.ac.uk/services/flood-estimation-handbook (accessed 03 May 2018)

Licensed surface and groundwater abstractions (Environment Agency)	This information will be used to understand potential effects of abstractions on the baseline conditions of surface and groundwater bodies, as well as potential pathways to be considered when assessing WFD impacts
Unlicensed surface and groundwater abstractions (Local Councils)	This information will be used to understand potential effects of abstractions on the baseline conditions of surface and groundwater bodies, as well as potential pathways to be considered when assessing WFD impacts
Surface water quality data (Environment Agency and Thames Water)	This information will be used to understand the baseline condition of rivers, lakes and reservoirs.
Borehole water level and water quality monitoring (Environment Agency)	This information will be used to understand the nature and baseline condition of the groundwater body.

5.2.6. The baseline assessment will also include analysis of the low-flow characteristics of each watercourse, using the LowFlows 2000TM (2010)[18] software. Low flows provide an area of continuously wetted habitat that helps to maintain ecological productivity with regard to populations of aquatic plants and animals. Furthermore, the low flow regime is important for maintaining physico-chemical water quality, including suitable water temperatures and dissolved oxygen concentrations. Note that low flow monitoring (described below) will provide additional detailed information regarding low flow hydrology.

Field-based assessment

5.2.7. A number of field-based assessments will be undertaken to inform the baseline characterisation of the water bodies in the Assessment Area, including a range of surveys and baseline monitoring.

Hydromorphology surveys

5.2.8. Hydromorphology surveys will be undertaken for all WFD water bodies within the Assessment Area. The surveys will collect data based on observations of the baseline geomorphological and hydrological processes, following the Fluvial Audit method (Annex 1). These data will significantly aid the understanding of the baseline condition of almost all of the WFD hydromorphology quality elements. Surveys will be undertaken throughout the Assessment Area, with detailed surveys within and immediately adjacent to the footprint of the Project. In addition, surveys will also be undertaken at other representative reaches within the water body catchments to obtain a broad water body baseline understanding. Targeted detailed surveys of a number of watercourses that are

[18] LowFlows 2TM (2010), Wallingford: Wallingford HydroSolutions Limited

judged by the Environment Agency to be in good condition will also be undertaken specifically to inform mitigation solutions and provide proxy conditions for future baseline.

Aquatic ecology walkover surveys

5.2.9. Aquatic ecology walkover surveys will be undertaken for all WFD water bodies within the Assessment Area. This will involve the ecological mapping of the watercourses within the geomorphology survey extent following River Corridor Surveys (RCS)[19] and River Habitat Surveys (RHS)[20] methods. The surveys will highlight key channel features and habitat characteristics. This will include the assessment of the suitability of fish habitat (including spawning habitat) within the affected watercourses at and adjacent to the location of the Project. Mapping will be supplemented with a photographic survey of all key features identified.

Ecological monitoring

5.2.10. Monitoring of specific biological quality elements will be undertaken in all river waterbodies present in the Assessment Area. This will include the collection of baseline data with the following surveys being carried out:

1. Macrophyte surveys
2. Macroinvertebrate surveys
3. Fish surveys.

5.2.11. The results from the monitoring will allow for an understanding of communities' composition and sensitivity in the Assessment Area. In addition, the results will also inform the definition of mitigation that may be appropriate for the Project.

5.2.12. In addition, ecological data or reservoirs will include data collected by Thames Water including phytoplankton and macrophytes. This data will allow for an understanding of ecological status for these parameters as well as primary production.

Surface water hydrology monitoring

5.2.13. In order to characterise the low and high flow hydrological baseline, improve the accuracy of the available gauged information, and better understand the connectivity and interactions among the multiple channels in the Assessment Area, temporary flow gauges will be installed on the following watercourses:

1. River Colne
2. Colne Brook
3. Horton Brook
4. The Poyle Channel
5. Duke of Northumberland's River

[19] National Rivers Authority (NRA), Guidance for river corridor surveys in the NRA, 1992
[20] Environment Agency, Environment Agency River habitat survey in Britain and Ireland, 2003

6. Longford River
7. Wraysbury River
8. River Crane (this is subject to confirmation)
9. River Pinn
10. Fray's River
11. Hithermoor Stream flood relief channel.

5.2.14. This hydrological monitoring network, coupled with the increased understanding of the existing gauged record, will significantly aid the understanding of spatial and temporal baseline flow quantity conditions across the watercourse network within the Assessment Area.

Groundwater baseflow accretion monitoring

5.2.15. Two rounds of flow accretion surveys will be undertaken along the water bodies surrounding the current airport. The purpose of this work is to improve the conceptual understanding of the degree of hydraulic connectivity between the surface water system and the underlying gravel aquifer, by comparing the rates of baseflow accretion over short river reaches down the main river channels. Surveys will be completed during both high and low flow conditions to determine whether the degree of groundwater surface water interaction is related to prevailing flow and groundwater level conditions.

5.2.16. The understanding developed from these surveys will inform the calibration and validation of the numerical groundwater modelling tool. This model will be used to assess the impact of construction and long term operation of the Project on the groundwater flow regime, and therefore the connectivity between groundwater and surface water. This will include an assessment of any change in the magnitude and location of baseflow accretion to the river channels.

Groundwater level monitoring

5.2.17. In addition to the ongoing groundwater monitoring programme being undertaken close to the airport, additional groundwater level monitoring boreholes will be installed across a wider area within the surrounding gravel aquifer. The groundwater level data from these boreholes will be used, in conjunction with other data sources, to improve the characterisation of the water-table, its response to hydrologically effective rainfall and deriving principal groundwater flow direction.

Groundwater and surface water quality monitoring

5.2.18. In order to produce a robust evidence base to support the WFD assessment groundwater and surface water quality monitoring will be undertaken across over a number of locations. A proportion of these surface water monitoring points are located in principal WFD watercourses, mainly focussing on the River Colne, Colne Brook, Wraysbury River and the Duke of Northumberland's River. The groundwater monitoring points are located to the north and west of the

airport and will provide samples for the Lower Thames Gravels WFD water body.

5.2.19. The data collected from both sets of monitoring will be used to provide information on the status of the WFD water bodies as well as providing calibration and baseline data to develop a surface water quality catchment model, which will be used to assess the likely impacts of the Project. Existing monitoring data collected by Thames Water for the lakes and reservoirs, together with groundwater quality monitoring data will be used to characterise the baseline condition of those waterbodies. Both the surface water quality catchment model and the approach to estimating lake and reservoir water quality are described in the Modelling Method Statement.

6. Step 2: WFD screening

6.1. Introduction

6.1.1. The screening assessment will consider the potential risk to WFD objectives as a result of the Project. It is designed to focus efforts on the parts of the Project that carry the most risk, and less effort on the parts that carry less risk. The screening assessment will draw on the relevant information associated with the Project and the WFD baseline data from the data collation stage.

6.1.2. Levels of risk will be identified utilising a combination of relevant information on the design of the Project, baseline data relating to the WFD water bodies that are likely to be impacted, and professional judgement. The results of the screening assessment will therefore identify the scope for detailed assessment of the likely impacts on WFD quality elements.

6.1.3. The screening assessment will comprise two key parts, including:

1. The potential impact of Project activities on current WFD status regarding 'no deterioration', including the identification of relevant surface water and groundwater WFD elements potentially affected by the residual impacts of each of the activities.
7. The potential impact of Project activities on status objectives, including:
    a. Screening of all relevant activities against Environment Agency surface water and groundwater body 'Reasons for Not Achieving Good' (RNAG) and 'Programme of Measures' (PoM) datasets, in order to identify where the Project poses a potential risk of worsening existing pressures responsible for status failures and/or adversely affecting or preventing the implementation of measures identified to address existing status failures. This will include any measures predicted to be implemented prior to the commencement of the scheme construction to ensure that they are included in the WFD baseline if relevant and to assess whether their success could be compromised by any of the elements of the scheme
    b. The screening of all activities against the Environment Agency HMWB and AWB 'Mitigation Measure Assessments' (MMA), in order to identify where the Project poses a potential risk of precluding the ability of measures to mitigate the potential impacts of existing physical modifications and operational regimes to support the achievement of GES objectives. The screening will therefore assess whether the Project may conflict with work undertaken to facilitate the attainment of good status.

6.1.4. The screening will be based on a qualitative assessment utilising expert knowledge to assess potential risks from scheme elements to WFD objectives.

6.1.5. The qualitative screening will use hydromorphological, biological, water quality and groundwater expertise to assess potential risks to WFD quality elements

and sub-elements from the scheme. The screening will assess the different activities in a matrix against the relevant individual water body quality elements, as shown in Table 18.1.3.

Table 18.1.3 WFD screening summary table, modified from Planning Inspectorate Advice Note 18 to enable screening of multiple activities

Water body ID	**Water body**	**WFD Element**	**Activity 1 etc.** e.g. River diversions	**Activity 2 etc.** e.g. Construction access track watercourse crossings
Unique GB code for waterbody	Name of waterbody	e.g. Hydromorphology: Quantity and dynamics of flow	Screened In/Out [insert rationale]	Screened In/Out [insert rationale]
		e.g. Biology: fish	Screened In/Out [insert rationale]	Screened In/Out [insert rationale]
		e.g. Physico-chemical: pH	Screened In/Out [insert rationale]	Screened In/Out [insert rationale]
		e.g. Groundwater: quantity	Screened In/Out [insert rationale]	Screened In/Out [insert rationale]

6.1.6. The assessment process will use an in/out system based on the risk of potential impact on WFD objectives as described below, and recommended by the guidance of the Planning Inspectorate[10].

6.1.7. Activities that are considered to pose a risk of compromising the ability to achieve target WFD status will be screened in for the detailed assessment stage. Activities that are considered to present no or negligible risk to the achievement of WFD objectives will be screened out. All screening outcomes will be recorded and justified.

Potential impacts on current status

6.1.8. This part of the screening assessment stage relates to the 'no deterioration of current status' aspect of WFD compliance objectives.

6.1.9. The activities identified during the design development stage will be screened in order to identify the potential for WFD impacts. This will be undertaken by assessing each activity against the WFD quality elements as described above. Both beneficial and adverse potential impacts will be considered. The screening will therefore identify the relevant WFD quality elements that are at risk from each activity that need to be scoped into a detailed WFD assessment.

6.1.10. For surface water bodies, potential impacts will be identified for each of the surface water body WFD quality elements, as follows:

1. Hydromorphological effects– considered in terms of likely changes in the quantity and dynamics of flow, river continuity (including existing restrictions such as sluices and weirs), river depth and width variation, structure and substrate and structure of the riparian zone.
8. Physico-chemical effects– considered in terms of likely changes in the chemical composition of phosphate and ammonia, or, for lakes and reservoirs, nitrate, and for physical changes which cause variations in dissolved oxygen and temperature.
9. Biological effects– considered in terms of likely change in composition and abundance of phytobenthos, macrophytes and macroinvertebrate communities and for fish on composition, abundance and age structure.
10. Specific Pollutant effects– considered in terms of likely changes in the chemical composition of specific pollutants (e.g. copper, triclosan, zinc, etc.).

6.1.11. For groundwater bodies, potential impacts will be identified for each of the groundwater body WFD quality elements, as follows:

1. Quantitative effects – be considered in terms of the likely changes in groundwater levels, groundwater flows and the hydraulic regime, spring flows and rates of baseflow to surface waters
11. Chemical effects - considered in terms of the likely changes in chemical water quality.

Potential impacts on the achievement of WFD status objectives

6.1.12. This part of the preliminary assessment stage relates to the ‘no prevention of status objectives’ attainment aspect of WFD compliance objectives. The screening will include all water bodies potentially impacted by the Project that are currently failing to meet their good ecological status / potential or good quantitative status objectives (with regards to surface water and groundwater bodies, respectively). Water bodies currently attaining good status will not be subject to screening for effects on the achievement of WFD status objectives, as they are already at target status.

6.1.13. Each of the activities will be screened against the WFD status elements of the relevant water bodies that are currently (at the time of construction) failing their good status objective under WFD, using the traffic light assessment described above. This will involve an assessment of whether the programme of measures derived to address failures; as identified by the Environment Agency within the 2016 Cycle 2 RBMPs, would be compromised by the Project. For A/HMWB water bodies, activities will be screened for effects on the mitigation measures identified by the Environment Agency in order for these water bodies to achieve GEP.

6.2. Assumptions and limitations

6.2.1. The WFD water body classification data used for the WFD assessment will be taken from the Environment Agency 2016 Cycle 2 Thames River Basin Management Plan (RBMP)[2121] data. These classifications are considered to provide the current best estimate of status and are the formal baseline against which the Environment Agency will assess compliance with the 'no deterioration' objective.

6.2.2. Consultation with the Environment Agency will identify any expected future changes to the current baseline WFD data.

6.2.3. Whilst it is assumed that the WFD baseline conditions during construction and operation of the Project will be improved relative to the baseline at that time, the WFD assessment proposes to use the current 2015 RBMP water body classifications as the basis of assessment.

6.2.4. Limitations with respect to design information will be identified. Where there is flexibility in the DCO application design the screening assessment will consider a reasonable worst case option. Where baseline data are limited, professional judgement will be used in the assessment utilising existing baseline data for other water bodies in the Assessment Area. The decision to screen any activities out will be fully justified.

[21] Environment Agency, Thames River Basin Management Plan Cycle 2, 2016

7. Step 3. Detailed Assessment

7.1. Introduction

7.1.1. This section of the report presents the proposed process for the detailed Water Framework Directive (WFD) compliance assessment. The detailed assessment follows the screening stage. It will not consider activities or WFD water bodies that were screened out as low risk during the screening stage.

7.1.2. The aim of the detailed assessment stage is to consider the likely impacts associated with the Project and conclude on the risk of causing deterioration of WFD status, the type and extent of mitigation that may be required in order to avoid the risk of deterioration and, where applicable, the risk of preventing the achievement of good overall status.

7.1.3. The detailed assessment methodology is structured as follows:

1. Section 8.2 provides the context for why a WFD detailed assessment will be necessary.
2. Section 8.3 provides the principles for defining the appropriate temporal and spatial scales.
1. Section 8.4 provides the proposed approach for assessing the risk of deterioration, followed by the outline methodology to be utilised in each case for hydromorphology and ecology (section 8.5), water quality / chemical status (section 8.6) and groundwater (section 8.7).
2. Section 8.9 provides the proposed approach to assessing the risk of the Project preventing the achievement of good status.
3. Section 8.8 provides some principles that will underpin the selection of appropriate mitigation of likely impacts associated with the Project
4. Sections 8.9, 10, and 11 discuss the proposed approach to assessing cumulative impacts, the use, if required, of Article 4.7 of the WFD, and the interplay between sites that are designated as Protected Areas under the WFD.

7.2. Scale of impact

7.2.1. WFD assessments are based on the principle of identifying likely impacts associated with a development that are both non-temporary and sufficient in magnitude to be identified at the ‘water body scale’.

7.2.2. It is therefore necessary to define the relevant spatial scales that present a risk of deterioration and/or the achievement of good status. Likely impacts that may be sufficient to cause deterioration of any WFD quality element ‘at the water body scale’ may be non-compliant with the WFD unless the conditions set out in Article 4.7 could be satisfied. However, for most WFD quality elements, there is no universally accepted guidance available to indicate the scale of impact that would allow such a conclusion to be derived. Therefore, some working definitions will be provided in order to understand the significance of spatial

impact and therefore inform a conclusion on the risk of an activity causing deterioration.

7.2.3. Similarly, impacts are considered to be temporary, and therefore not to constitute deterioration of WFD status, if the water body would[22]:

1. Be impacted only temporarily for a short period of time
2. Recover within a short period of time and/or
3. Recover without the need for any mitigation.

7.2.4. However, for most WFD quality elements, there is no universally accepted temporal threshold or guidance available to indicate what constitutes a 'short period of time', and therefore what is a temporary/acceptable period of deterioration.

7.2.5. Fluctuations in the condition of water bodies can sometimes occur as a result of short-duration human activities, such as some construction or maintenance works. It is therefore necessary to provide a working definition in order to understand the temporal nature of any likely impact and therefore inform a conclusion on the risk of an activity causing deterioration.

7.3. Assessing risk of deterioration

7.3.1. The diverse nature of and monitoring approaches for the different WFD quality elements necessitates that bespoke assessment approaches are developed for each. The detailed assessment methodology is therefore based on the different requirements for:

1. Hydromorphology and ecology
2. Water quality
3. Groundwater

7.3.2. The following sections describe the proposed approaches for each.

7.4. Hydromorphology and Ecology

7.4.1. Hydromorphology and ecology are intrinsically linked in so far as hydromorphology provides the physical habitat for fish, macrophytes and invertebrates to live and thrive. As such, understanding the likely impacts on hydromorphology, as a result of new physical modification associated with the Project, is a key step in undertaking a WFD compliance assessment. This section is associated with river water bodies only, as they are the only surface water body category that are expected to experience changes to hydromorphology.

7.4.2. It is necessary to understand scale and severity of likely impacts on hydromorphology in order to decipher the potential ecological response to altered habitat conditions. This understanding will inform the identification of the

[22] European Commission, Common Implementation Strategy for the Water Framework Directive (2000/60/EC). Guidance Document No. 20, 2009

appropriate type and scale of mitigation that may be necessary in order to be able to demonstrate that the net effect of the suite of Project activities will not result in deterioration of the baseline WFD ecological status / potential.

Measuring impact

7.4.3. An approach that quantifies the spatial scale of impacts that may occur within a WFD water body is necessary in order to make an initial judgement on the extent of the impact in respect to the scale of the WFD water body. Understanding spatial impact also facilitates a clear definition of the spatial extent of mitigation that may be required in order to manage likely impacts to an acceptable level such that they would not result in deterioration.

7.4.4. The calculation of impacted channel length will be measured using the criteria provided in the Environment Agency's position 488_10. This includes the full extent of upstream and downstream impact and will be undertaken for each individual hydromorphology and ecology quality element listed in Annex 5 of the WFD, in recognition that different activities will have a different scale of impact depending on the quality element in consideration. Where the upstream/downstream extent of the impact of an activity on a quality element is uncertain, an additional buffer length (based on the type of activity) may be added to account for uncertainty. Where this is the case, evidence will be presented to demonstrate the appropriateness of the buffer distance applied.

7.4.5. In the case of likely impacts to the riparian zone, should both banks be affected, the combined length of the two river banks will be the total impact length for the activity.

7.4.6. If the same type of activity is being undertaken intermittently but is separated by a distance of less than 200m, the total combined channel length will be measured (i.e. including the intermediate gaps). Where the same activity is separated by a distance of greater than 200m then the two activities will be measured separately.

7.4.7. However, the Environment Agency's 488_10 guidance does not help in the understanding of how important a given length of impact may be at the water body scale. In order to address this shortcoming, the next step will be to calculate the channel length that may experience the impact as a percentage of the length of the 1:50,000 Ordnance Survey (OS) river network within the WFD water body catchment. This will ensure that impacts are assessed using robust data that reflect the genuine length of watercourse network within the water body catchment, rather than using the arbitrary WFD 'blue line' which represents only the length of trunk watercourse/s with a catchment.

7.4.8. The total length of the 1:50,000 OS river network for each relevant WFD water body in the Assessment Area is presented in Table 18.1.4, along with a comparison of the WFD 'blue line' length. The table also demonstrates the difference between more 'natural' water bodies, that have an associated hydrological catchment, and the artificial surface water transfer channels which

do not have a catchment drainage network. Note that this approach is only relevant to rivers (as listed in Table 18.1.4), as ecological response to hydromorphological impacts would only be relevant in this context. Ecological response to water quality impacts in rivers, lakes and reservoirs is discussed in Section 7.5 below.

Table 18.1.4 Water body river network length for surface water bodies in the Assessment Area. Water body line length is also provided for comparison purposes. Please note that water transfer and canal water bodies do not have an associated water body catchment

WFD water body name	WFD water body line length (the 'blue line')	WFD water body catchment area	WFD water body catchment 1:50K OS river network length	Ratio of river network :blue line
Colne (conf Chess to River Thames	51.49km	89.32km^2	133.92km	*2.60*
Colne Brook	15.21km	10.03km^2	29.12km	*1.92*
Colne (from Confluence with Ver to Gade)	21.27km	65.33km^2	77.51km	3.64
Chess	20.13km	94.98km^2	37.54km	1.86
Misbourne	27.04km	91.55km^2	38.92km	1.44
Pinn	19.89km	45.81km^2	68.34km	3.44
Ver	28.25	146.35 km^2	62.23	*2.20*
Gade (conf. Bulbourne to Chess)	15.02	72.47 km^2	28.3	*1.88*
Crane	13.73km	57.11km^2	31.40km	*2.29*
Horton Brook	19.72km	25.66km^2	44.53km	*2.26*
Portlane Brook	7.22km	23.27km^2	10.06km	*1.39*
Surrey Ash	11.13km	19.01km^2	122.34km	*2.03*
Thames (Cookham to Egham)	30.06km	65.88km^2	152.72km	*5.08*
Thames (Egham to Teddington)	31.32km	44.82km^2	72.35km	*2.31*
Upper DNR	10.57km	n/a	10.57km	*1.00*
Longford River	16.14km	n/a	16.14km	*1.00*
Lower DNR	4.13km	n/a	4.13km	*1.00*

Grand Union Canal (Uxbridge to Hanwell Locks, Slough Arm, Paddington Arm)	45.50km	n/a	45.50km	*1.00*

Assessing the importance of the impact at the water body scale

7.4.9. The percentage of water body length that would be impacted by each activity would be used to inform an initial assessment of the level of impact. This is an important step that is required in order to understand the different levels of risk that may be associated with various different activities and ultimately the type and extent of mitigation that may be required to address the impact.

7.4.10. Specific percentage thresholds will be proposed to define whether the level of impact would be negligible, low, medium or high, as shown in Table 18.1.5.

7.4.11. In addition, and taking into consideration the likely continuous length of impact of some activities and the variable sizes of water body networks, it is proposed that absolute threshold lengths are also used as an additional metric for an initial classification of the levels of likely impact shown in Table 18.1.5. As such, it is proposed that the lowest value (i.e. whichever of the percentage and absolute length values is shortest) will be used to define the level of impact.

7.4.12. Both spatial thresholds (percentage of the water body and absolute impact length) are currently being consulted upon with the EA. They will be presented along with an initial outline WFD assessment as part of the section 42 consultation.

Table 18.1.5 Traffic light rating proposed to assess likely impact of Project activities on WFD objectives.

Likely impact	Threshold (total % of WFD catchment river network length affected or absolute length)
Negligible (No or negligible measurable impact on status for the quality element)	An appropriate percentage and/or absolute channel length that is commensurate with negligible impact
Low (localised impact when taken on its own – unlikely to impact status of the quality element)	An appropriate percentage and/or absolute channel length that is commensurate with low impact
Medium (may affect status for the quality element)	An appropriate percentage and/or absolute channel length that is commensurate with medium impact

High (adverse impact is likely to be of sufficient scale to impact on the status of the quality element)	An appropriate percentage or absolute channel length that is commensurate with high impact

Assessing the sensitivity of the water environment at the point of impact

7.4.13. Along with an understanding of the spatial scale of likely impacts it is also necessary to consider the sensitivity of the part of the water body that is being impacted in order to conclude the extent to which the impact is important at 'the water body scale'. Impacts are likely to differ depending, for example, on whether important habitats for the status of a water body are affected by an activity. Therefore, it is necessary not only to consider the extent of the likely impact (Table 18.1.5) but also the sensitivity of the watercourse that would be affected. For example, for the same activity and length of impact, the overall effects might be different for modifications in sections of a water body without significant value for the ecosystem, compared to 'very sensitive' stretches hosting key habitats e.g. for spawning of a certain fish species.

7.4.14. In this context, it is necessary to provide criteria to demonstrate whether or not an activity would impact a 'very sensitive' reach that is considered to be of fundamental importance to the ecological health of the WFD water body. The criteria for determining what constitutes a 'very sensitive' reach will be presented in the outline WFD assessment that will be an appendix to the Preliminary Environmental Information Report (PEIR). This will be based on analysis of baseline hydromorphology and ecology survey data and further discussion with stakeholders.

7.4.15. It is proposed that all Project impacts within these very sensitive reaches would be automatically classified as high impact in accordance with the definition set out in Table 18.1.5, regardless of their spatial extent.

Assessing whether the impact is temporary or permanent

7.4.16. Further to considering the scale of impact and the sensitivity of watercourse that would experience the impact, the final consideration to make before deciding on the appropriate type and extent of mitigation is whether the impact would be temporary or permanent.

7.4.17. 'Short duration' temporary impacts due to works during the building phase of the Project may not require mitigation if no deterioration of status or potential could be expected thereafter in the water body, or parts of the water body. Unfortunately, there is no definition for 'short duration' or 'temporary' in the context of WFD compliance. Available guidance hints at the frequency of monitoring programmes as a means of indicating what could be considered as temporary. It suggests that if deterioration could be traced during the WFD monitoring cycle such that it would need to be reported in the subsequent

RBMP, then this would be considered to be permanent deterioration. In this case, the latest RBMP will provide the official baseline from which deterioration will be assessed rather than the results of any within-cycle (e.g. annual) monitoring.

7.4.18. However, this principle introduces a temporal bias. Impacts that occur before a cycle of monitoring for publication in the subsequent RBMP would be far more likely to lead to 'permanent' deterioration compared to impacts that occur after the publication of a RBMP.

7.4.19. In order to address this bias it is proposed that, for the hydromorphology and ecology quality elements, temporary impacts will be considered to be those where there is evidence (to be established in the PEIR and ES) to suggest that the baseline condition of the water environment would re-establish within three years from the commencement of works. This follows the precedent of previous large infrastructure projects of national importance (e.g. High Speed Rail[23]). For example, if there is evidence to indicate that a temporary river diversion would impact all quality elements other than water quality for a period of less than three years before the watercourse is restored to its original course and baseline condition, this impact would be considered temporary. It is proposed that any impact of longer duration than three calendar years from the commencement of works would be considered permanent.

7.4.20. Using this definition, appropriate mitigation would be implemented for any activity that would have a likely impact of greater than three calendar years duration, regardless of whether the activity is temporary or permanent. The appropriate type and amount of mitigation would be proportionate to the level of impact and the sensitivity of the watercourse that would be impacted, following the approach presented above. Provision of offset mitigation would not be required for such temporary impacts. However, activities that result in temporary deterioration would include the same design mitigation as all other activities such that the overall residual impact would be as low as possible.

7.5. Water quality / Chemical Status

7.5.1. The assessment of likely surface water quality (chemical and physico-chemical) impacts will consider both river and lake water bodies. Subsequent impacts on aquatic plants in lakes are expected to be derived from these.

7.5.2. In order to provide sufficient data to support the WFD assessments, water quality modelling will be undertaken to clarify the current baseline and then potential future impacts, specifically to answer two main objectives:

[23] HS2, High Speed Rail (West Midlands – Crewe) Environmental Statement Volume 5: Technical appendices. Environmental Impact Assessment Scope and Methodology Report Addendum (CT-001-002) Part 2. Annex N: Water and Flood Risk – Technical notes, 2017

1. Establishing the baseline water quality of the river catchments in order to assess the impacts of changes in nutrients and chemicals. This will help with the assessment of compliance against relevant water quality Environmental Quality Standards (EQSs) including Water Framework Directive (WFD) standards; and
2. Establishing baseline nutrient budgets of relevant lakes and reservoirs and to assess the likely impact of changes in their nutrient concentrations and loadings due to the Project. This will help with the overall assessment of the impacts on the Southwest London waterbodies Special Protected Area (SPA).

7.5.3. For these objectives two water quality models will be used. River catchment modelling will use both the SAGIS and Simcat models, which will be employed on the following rivers:

- Colne (including River Colne, Horton Brook, Wraysbury river, Colne Brook and Ash river)
- River Crane
- River Thames.

The lake modelling will involve development of conceptual models for reservoirs and lakes that get scoped into the detailed assessment. Full details of the modelling approach are provided in the Surface Water Quality Modelling Method Statement (Appendix 18.3).

7.5.4. The bulk of the detailed assessment for water quality will be focussed on river water bodies, as they are likely to be subject to more direct water quality impacts as a result of the Project. The overall objectives for the modelling for the river water body impact assessments will be to ensure that any likely impacts on water quality from the Project are compliant with relevant regulatory objectives. This will be achieved by demonstrating that:

- The Project will not lead to a breach of any relevant EQS's (e.g. annual averages or maximum allowable concentrations) or significant deterioration in concentrations of water quality determinands beyond those covered by the WFD (e.g. nitrates in freshwaters)
- The Project will not cause deterioration in WFD class of any water quality element either within the lifetime of the Project or beyond
- There will be less than 10% deterioration in water quality within WFD class (an aspirational target set by the Environment Agency for water quality assessments)
- The Project will not prevent downstream water bodies from reaching Good Ecological Status or Potential.

7.5.5. In order to ensure that the baseline SIMCAT model and final assessment are robust three steps will be undertaken, including:

- Initial calibration: This will involve ensuring all the baseline data in the model, at sample point and water body level, is up to date and represents the current WFD classifications
- Final calibration: This will involve ensuring all new sample data for metals and chemicals to be assessed are included in the model
- Modelling: At this stage two runs of model scenarios will be assessed for the Project looking at the construction and operational phases of the development.

7.5.6. Having developed and calibrated the catchment model, the river network in the SIMCAT model will be changed to reflect the proposed watercourse configuration that is required as a result of the Project. This is expected to include:

- Physical changes to watercourses
- New channels
- Land use changes
- Changes to or new discharges/abstractions.

7.5.7. It is anticipated that the SIMCAT model developed to represent the construction phase of the development will simulate a modified version of the existing, baseline river network, taking into account the locations of watercourses that may be diverted during construction activities. The SIMCAT model of the operational phase of the development will represent the river network as it will be on completion of construction and as described in the final DCO design.

7.5.8. For lakes and reservoirs a simpler approach will be employed, based on the development of a conceptual model of each waterbody (i.e. the principal sources of nutrient inputs to each waterbody). These are likely to include:

- Nutrients in water pumped into the waterbody (e.g. for storage reservoirs);
- Direct runoff from the catchment to the lake or reservoir;
- Inputs in groundwater (where hydraulically connected to groundwater);
- Inputs from birds and fish;
- Atmospheric deposition.

7.5.9. These inputs, only some of which are likely to be relevant for each lake or reservoir, will be estimated from water quality data and literature values. Nutrient retention will be estimated using equations described in the literature. Potential changes in nutrient water quality in lakes or reservoirs due to changes in inputs (e.g. changes in rates of atmospheric deposition) will then be assessed relative to the baseline condition.

7.5.10. The outputs from the modelling will be assessed against the criteria noted above (section 4.4.4) at both the sample point and water body scale. The

results will be presented both graphically and spatially to allow for appropriate identification of locations that may require mitigation.

7.5.11. For both rivers and lakes/reservoirs the effects of likely changes in water quality on aquatic ecology receptors will be evaluated. Ecological data collected will be used to derive ecological EQSs. In particular the effects of likely changes in nutrients on primary producers (macrophytes in rivers and lakes and phytoplankton in lakes) will be will be discussed based on literature.

7.5.12. Specifically, any changes in water quality nutrients and chemicals below the thresholds noted in 7.5.4 will be considered not likely to result in a significant effect on biological quality elements and not likely to result in a deterioration in WFD class of any biological quality element.

7.6. Groundwater

7.6.1. The assessment will determine likely impacts on groundwater level and quality from the Project activities. To support the WFD assessments, groundwater monitoring (baseflow accretion surveys, groundwater level and groundwater quality monitoring) will be undertaking in order to provide a clear understanding of baseline conditions and to inform and calibrate the groundwater model.

7.6.2. Having developed and calibrated the groundwater model on measured site conditions, it will then be used to assess the effects of Project engineering structures and activities on WFD groundwater quantitative and qualitative status and status objectives. The impacts will be quantified using a carefully defined set of scenarios that represent the engineering features of the Project.

7.6.3. The activities and how they will be represented by the model will be discussed and agreed with the key stakeholders as the work develops. Consultation with will also be necessary to determine how the level of impact will be classified. It is expected that WFD quantitative and qualitative impacts will be listed against the different activities of the Project.

7.6.4. Impacts on groundwater quantity could include:

1. Water table recharge reductions.
2. Changes in groundwater levels and flow direction due to dewatering during construction.
3. Changes in groundwater flow as a result of the construction of low permeability barriers below the water table as well as high permeability ‘drainage’.
4. Lowering of groundwater levels to below the existing water table.

7.6.5. The impacts could be reflected by the WFD in a number of ways by WFD quantitative and chemical sub-elements, for example changes in groundwater levels from the baseline condition, changes in groundwater inflow and outflows to surface water and/or changes to existing groundwater quality conditions.

7.6.6. Groundwater WFD quantitative and chemical elements will be considered against the proposed Project activities, providing an assessment of the impacts of each activity. The assessment will need to consider whether such impacts are likely to cause deterioration on the groundwater WFD parameters. Therefore there is the requirement to assess whether an activity could cause:

1. Any measurable change to groundwater levels or quality
2. Impacts on groundwater levels or quality and whether these are of a localised or temporary nature and whether they would impact on groundwater body status
3. Impacts that would have an adverse effect on WFD elements of groundwater levels or quality but would be unlikely to change status at the water body scale.
4. Impacts that would have an adverse effect on WFD elements of groundwater levels or quality and are likely to change status at the water body scale.

7.6.7. Where an impact that could cause deterioration is identified relevant mitigation measures to reduce the impacts will be assessed.

7.7. Assessing the risk of preventing the achievement of good status

7.7.1. As well as implementing a method of WFD assessment that is aimed at preventing deterioration of baseline WFD status, it is also necessary to consider whether the Project will compromise any measures required to facilitate the achievement of the target water body status. Along with ‘no deterioration’, this is the other headline principle of the WFD.

7.7.2. In order to address the risk of failure to achieve good status/potential, it is first necessary to understand the reasons why each of these water bodies do not currently attain these conditions. Second, it is necessary to understand the actions that have been identified by the Environment Agency that are required for the water bodies to attain good status/potential.

7.7.3. Most water bodies in the Assessment Area are either Artificial or Heavily Modified, and do not currently achieve good ecological potential. These water bodies have a series of WFD Mitigation Measures that need to be implemented in order for the water body to achieve GEP. Biological quality elements that are not sensitive to the human use for which the water body has been designated as a A/HMWB will also have specific measures that need to be addressed in order to facilitate conditions that are equivalent to good ecological status. These are all included within the WFD Programme of Measures for the Thames RBMP.

7.7.4. For example, if a water body is failing to achieve good status for fish, and this is known to be due to barriers to fish migration in the catchment, the measures to address the pressure are likely to seek to remove barriers to fish migration. The WFD programme of measures will specify how this is to be achieved in practice, and whether there are specific barriers that need to be removed. In such a

case, if the Project were to install a new permanent barrier to fish passage, then it would be precluding or at best restricting the ability of the mitigation measure to be delivered. It would therefore result in a high risk of failure to achieve GEP in the water body. If this situation could not be prevented, then it would result in the Project being non-compliant with the WFD and therefore trigger the requirement for an Article 4.7 assessment.

7.7.5. For every water body in the Assessment Area, the Environment Agency Programme of Measures would be screened to determine if the Project presents any conflicts with any of the measures and conversely whether there are opportunities as part of the Project to facilitate the delivery of any measures. If the Project presents a risk/opportunity then they will be considered as part of the detailed assessment. In such cases, appropriate dialogue will take place with the Environment Agency and other stakeholders so that effort is made to avoid conflicts with, and take opportunities to deliver, the measures. All such cases will be reported in the WFD assessment.

7.8. Mitigation

7.8.1. The assessment of likley impacts as a result of Project activities will facilitate an understanding of the requirements for mitigation to both prevent deterioration and/or ensure that the Project does not compromise the ability of the relevant water bodies to achieve GES/GEP.

Hydromorphology and ecology

7.8.2. Mitigation will be incorporated into the Project in two main ways, falling under the categories of ‘embedded mitigation’ and ‘additional mitigation’. Further definition of these terms is provided in section 3.7 of the Scoping Report.

7.8.3. The design of all Project infrastructure to be located within rivers or that would have an impact on rivers will be undertaken, as far as practicable, in a way that works with natural processes. As such, ‘embedded mitigation’ would aim to provide post construction hydromorphological conditions that are at least as good, if not better, than the current baseline hydromorphological conditions (i.e. pre-construction).

7.8.4. In situations where the required level of design mitigation is either not possible or impracticable, and/or where the scale/location of the impact of new physical modification is sufficient to present a non-temporary risk to WFD objectives at the water body scale, then the Project would provide ‘additional mitigation’. This would seek to improve an appropriate amount of the water body in order to ‘offset’ the impact of the physical modification. The type and extent of additional mitigation would need to be both equivalent to the WFD quality elements that were affected and appropriate in scale to offset the extent of the impacts, as outlined in Table 18.1.6.

Table 18.1.6 Traffic light rating proposed to assess the likely impact of Project activities on WFD objectives, and subsequent mitigation that would be provided. See also Table 18.1.5

Likely impact	Threshold (total % of WFD catchment river network length affected or absolute length)	Approach to mitigation of impact
Negligible (No or negligible measurable impact on status for the quality element)	An appropriate percentage and/or absolute channel length that is commensurate with negligible impact	Requirement of environmental best practice and **embedded mitigation only** (i.e. mitigate the effect at source through design mitigation and environmental best practice). If this is not possible, then an appropriate amount of offset mitigation would be provided.
Low (localised impact when taken on its own – unlikely to impact status of the quality element)	An appropriate percentage and/or absolute channel length that is commensurate with low impact	
Medium (may affect status for the quality element)	An appropriate percentage and/or absolute channel length that is commensurate with medium impact	**Embedded mitigation** and environmental best practice **plus additional mitigation**. This would provide appropriate improvements elsewhere in the WFD water body that are proportionate to the WFD quality elements that would be impacted by the Project.
High (adverse impact is likely to be of sufficient scale to impact on the status of the quality element)	An appropriate percentage or absolute channel length that is commensurate with high impact	

7.8.5. The ultimate aim of the detailed assessment is to identify the requirement for mitigation so that the WFD assessment can implement measures to ensure no net deterioration for all Project activities. In order to identify these requirements it is necessary to measure the scale of the impacts, the sensitivity of the lengths of watercourse affected, and whether the impacts are be temporary or permanent. The approach for undertaking these steps is presented below.

7.8.6. In the case of moderate and major impacts on hydromorphology and ecology, it is proposed that both embedded mitigation and additional mitigation would be proposed in order to increase the level of confidence that the associated

activities would not compromise WFD compliance (Table 8-3). In such cases, additional mitigation to address impacts associated with activities would be specifically tailored to address the impacted WFD quality elements that would experience the moderate/major impacts. Low and negligible impacts are proposed to be addressed through embedded mitigation only. However, in the event that it is not possible or practicable to mitigate for the impacts through the design alone (e.g. a well-designed culvert would not be able to provide appropriate lateral connectivity between the river and the floodplain), an appropriate amount of additional mitigation would also be provided. The process of determining what is an 'appropriate' amount of mitigation is currently being consulted upon with the Environment Agency.

7.8.7. This proposed approach is intended to ensure that the mitigation would be sufficient to prevent deterioration.

7.8.8. A study of potential for additional mitigation opportunities within the Assessment Area is ongoing and an initial approach was shared with the Environment Agency in September 2017. Additional potential mitigation opportunities will be discussed with stakeholders and refined during 2018.

Upper Duke of Northumberland's River and Longford River

7.8.9. The Upper Duke of Northumberland's River and the Longford River are Surface Water Transfer bodies and, as such, they do not have an associated WFD water body catchment. This means that there is unlikely to be sufficient river channel elsewhere in the water body to improve as part of the additional mitigation that may be required in these water bodies. So, although embedded mitigation may contribute to a net improvement compared to the modified baseline channels, it may not be possible to accommodate additional mitigation within these water bodies. In order to address this inconsistency it is proposed that if additional mitigation is required to address likely impacts in the Upper Duke of Northumberland's River then this would be provided within the Colne and/or the Crane WFD water bodies as an alternative. The same principle would be applied for any likely impacts on the Longford River that may require additional mitigation and in that case the Colne would provide the donor water body. These adjacent water bodies are hydrologically connected to Longford River and Duke of Northumberland's River and therefore are considered to be appropriate locations for the provision of satisfactory additional mitigation.

Water quality

7.8.10. Mitigation to protect surface water quality will be determined based on any likely impacts identified as a result of the modelling approach presented in section 8.5. It is expected that environmental construction best practice will provide sufficient mitigation for some construction related impacts. However, for all phases of the Project, where modelling or water quality assessments indicate likely significant impacts on water quality, the location and type of impact will be fed into the wider WFD mitigation plan to ensure that appropriate measures can

be put in place (e.g. if modelling indicates that there is an increased risk of failure due to land use changes then the stretches of river at risk will be highlighted for measures such as buffer strips in order to minimise or remove the pathway for the source of the impact and the watercourse in question).

7.9. Cumulative and in-combination impacts

7.9.1. It is possible that multiple impacts associated with the Project could, result in 'in combination' impacts on WFD objectives. Furthermore, Project activities could, along with pressures as a result of new developments, cause 'cumulative' impacts on WFD objectives.

7.9.2. In the case of in combination effects, the approach set out in section 8.8 outlines the intention for all activities resulting in any likely impact to be fully mitigated through either embedded mitigation and, if appropriate, additional mitigation elsewhere in the WFD water body catchment. Adhering to this principle would mean that the sum of impacts associated with all Project activities should, in theory, result in no in combination effects that compromise the objectives of the WFD.

7.9.3. An assessment of cumulative impacts as a result of other new developments with the Assessment Area will be presented as the EIA progresses.

8. Article 4.7

8.1.1. If the WFD compliance assessment finds that the Project will compromise compliance and no appropriate mitigation is practicable to prevent it, the appropriate steps will be taken and information provided to justify permitting the development under Article 4.7 of the WFD.

8.1.2. Article 4.7 of the WFD directs that Member States will not be in breach of the Directive when failure to meet its environmental objectives is the result of either new modifications to the physical characteristics of a water body, or as a result of new human sustainable development on the proviso that the modifications or new development proposed are compliant with four key conditions. In so doing, Article 4.7 provides a means whereby a derogation for a proposed modification or sustainable development may be granted where it meets these four conditions. The Article 4.7 process can also be applied in the case of water body impacts that will prevent achievement of the WFD's environmental objectives.

8.1.3. In summary, the provisions of Article 4.7 will only apply where:

1. Failure to meet good groundwater status, GES or GEP or to prevent deterioration in status arises from new modifications to the physical characteristics of the water body or alteration of groundwater levels; or
2. Failure to prevent deterioration from high to good overall status of a surface water body is the result of new sustainable human development activities.

8.1.4. Whilst paragraph 5.182 of the draft NPS stipulates that aim is for the Project to avoid the use of Article 4.7, if the assessment shows that the scheme will not be compliant with these WFD requirements, then documentation will be prepared to justify permitting of the development under the provisions of Article 4.7 of the WFD. This would only be applicable if the project were to compromise WFD objectives as a result of modifications to the physical characteristics of any water bodies within the Assessment Area, and would need to demonstrate that all of the following conditions are met:

1. All practicable steps have been taken to mitigate adverse impact on the status of the water body;
2. The reasons for the modifications or alterations, or for the sustainable development activities, are of overriding public interest;
3. The benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the new modifications or alterations, or of the sustainable development activities, to human health, to the maintenance of human safety, or (in the case of modifications or alterations) to sustainable development; and
4. the beneficial objectives served by the modifications or alterations, or by the sustainable development activities, cannot, for reasons of technical feasibility or disproportionate cost, be achieved by other means which are a significantly better option.

8.1.5. If the above conditions can be met then the reasons for the modifications or alterations, or for the sustainable development activities, must be set out and explained in the RBMP.

8.1.6. The relevant permitting authority in relation to each application for permission to proceed with the project is responsible for deciding whether the Article 4.7 conditions have been met, if the use of Article 4.7 is invoked. In the case of the Project, they key permitting authority is the Secretary of State.

8.1.7. If this situation arises, the design process will ensure that the necessary demonstration and audit trail to meet the requirements of Article 4.7 would be presented.

9. Other legislation

9.1.1. The WFD compliance assessment work is being undertaken in close communication with other design and water environment impact assessment work. More detailed information on other relevant legislation related to the water environment is provided in the following documents: Chapter 6 Biodiversity (including outline Habitat Regulations Assessment), Appendix 6.5 Biodiversity Offsetting Strategy, and Chapter 8 Water Environment.

Appendix 18.2
Numerical Groundwater Modelling Method Statement

This report has already been issued to some stakeholders for their consideration. As such, the report, the description of the development and some of the terminology used reflects the point in time that the report was produced and may differ from that presented in Volume 1 of this Scoping Report

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Internal



Heathrow Expansion Project: Numerical Groundwater Modelling

Method Statement

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Stakeholders (Internal)

Name	Role
Heathrow Airport Ltd	
Task Order 5.1 River Diversions	
Task Order 5.3 Environmental Impact Lead	
Task Order 5.3 Land Quality	
Task Order 5.3 Water Resources	
Task Order 5.3 Hydrology	
Task Order 7.0 Earthworks	

Stakeholders (External)

Name	Role
Environment Agency	Regulator – water resources, groundwater quality, WFD compliance

Name	Role
Natural England	Advisor to the Regulator with regards to groundwater dependency of terrestrial ecosystems

Checked by: Name: [redacted]

Role: TO5.3 Natural Environment Workstream Lead

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1. Executive Summary

1.1.1. The conceptualisation and numerical simulation of groundwater movement and its interaction with surface water are required to support the Environmental Statement (ES) and forthcoming Development Consent Order (DCO) submission for the Heathrow Expansion Project.

1.1.2. The ES will require quantitative assessments of the effects of construction and operation on the groundwater environment and any associated receptors. Hydrogeological conceptual and numerical models provide the best available tools to make these assessments, with the additional benefit of helping to quantify uncertainty and hence improve confidence in the impact predictions.

1.1.3. Making as much use as possible of the geological, groundwater and other environmental datasets is regarded as a key activity. Obtaining early agreement from key stakeholders regarding the detailed modelling approach and development of construction and operational scenarios is also considered to be critical.

1.1.4. This document outlines the rationale for the development of such a model, proposals for its spatial extent, and what questions it may be expected to address to assess credibly, and to the satisfaction of stakeholders, the impact of the expansion of Heathrow Airport on the sub-regional groundwater flow regime.

1.1.5. The proposed model will also provide the ability to simulate the interaction between ground and surface waters; most significantly, the major river systems to the west of the current airfield, which are likely to be subject to realignment.

1.1.6. It is envisaged that the model will be used to quantify the change in groundwater flow regime (e.g. groundwater levels, flow direction, velocity, discharge location, and interaction with surface features) both during the short-term construction period and the longer-term airfield operation period, post-construction.

1.1.7. Given the flexibility of the model design, it will also be possible to explore and assess potential mitigation measures that seek to reduce any predicted environmental impacts.

1.1.8. Note that it is not currently proposed that the model described in this document be used to support the detailed design of engineered structures and their construction methods. Such work will require additional and detailed quantitative analysis by the design teams. Examples include the detailed design of borrow pits, the filling of lakes or de-watering operations for construction.

1.1.9. However, it is intended that the sub-regional model will incorporate the final design of each major engineering structure to determine the likely

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environmental impacts (including in-combination effects), both pre-and post-mitigation measures being incorporated.

2. Introduction

2.1. Background

2.1.1. Heathrow are developing plans for a new runway at Heathrow Airport and associated infrastructure (known as the Heathrow Expansion Project). The proposed runway location is to the north of, and adjacent to, the existing Heathrow Airport complex and will intersect the M25 and several main river watercourses located to the west of Heathrow.

2.1.2. The Heathrow Expansion Project falls under Section 23 of the Planning Act 2008 (the Act) as a Nationally Significant Infrastructure Project (NSIP). Under Section 31 of the Act, development consent is required to the extent that it is, or forms part of, an NSIP. Development consent is granted by the making of a DCO for which an application may be made to the Planning Inspectorate (PINS) under Section 37 of the Act.

2.1.3. An ES is a statutory component of a DCO application and a numerical groundwater modelling and impact assessment will comprise an appendix to the ES, extracts from which will be reported in the main ES text.

2.1.4. The ES is typically preceded by an environmental Scoping Report and a Preliminary Environmental Information Report (PEIR).

2.1.5. Both the Scoping Report and PEIR will be subject to public consultation, including with both statutory and non-statutory stakeholders. The key consultees of interest to groundwater modelling and associated impact assessment include the Environment Agency in its capacity as principal regulator, together with Natural England and the relevant water supply companies (principally Affinity Water and Thames Water).

2.2. Method Statement

2.2.1. The groundwater modelling method statement outlined in this document expands upon the ongoing collation and analysis of historic groundwater level baseline data, used to inform the underlying conceptual understanding of the sub surface and groundwater interactions with surface features, such as rivers, ponds and other potentially groundwater dependent ecosystems.

2.2.2. It also assumes that new groundwater level data will be made available from the current intrusive surveys being undertaken. This will enable the current conceptual understanding to be refined further.

2.2.3. In a hierarchical context, the groundwater modelling and impact assessment will be prepared in with the context of the Planning Act 2008 and the relevant National Policy Statements (including the Airports National Policy Statement (ANPS) once enacted and the National Networks NPS).

2.2.4. Where the respective NPSs do not provide the necessary level of detail, reference will be made to the National Planning Policy Framework (NPPF).

2.2.5. The principal statutory consultee on groundwater resource management and groundwater quality protection is the Environment Agency. On matters concerning likely effects on designated sites, Natural England is also a statutory consultee, and, furthermore, is considered to be an important consultee in relation to any likely effects on other areas of wetland or aquatic habitats.

2.2.6. In addition, given that expansion of the airport overlies several principal aquifers (as designated by the Environment Agency), current public water supply abstraction licensees (e.g. Affinity Water and Thames Water) are also expected to be important consultees.

2.3. Relevant Legislation

2.3.1. The quantification of likely effects of construction and long-term operation of the expanded airport on groundwater is required as part of the DCO process and the associated Environmental Statement.

2.3.2. Of primary importance is to meet the legal requirements on the EU Water Framework Directive (2000/60/EC) the Groundwater Daughter Directive (2006/118/EC) and the EU Drinking Water Directive (98/83/EC) to demonstrate that there will be no detrimental impact on the status of groundwater bodies with which expansion activities will interact, and that there is nothing to prevent “good” status being achieved.

2.3.3. Such assessment considers the likely effects on the status of both groundwater quality and quantity.

2.3.4. To achieve good groundwater quantitative status, the available groundwater resource must not be exceeded by the long-term annual average rate of abstraction. Groundwater abstraction must not also cause failure of good ecological status in dependent surface water bodies, significant damage of dependent wetlands (groundwater dependent terrestrial ecosystems) or saline or other intrusions.

2.3.5. Groundwater chemical status is measured by concentrations of pollutants and changes in electrical conductivity in the groundwater body such that it does not exhibit effects of saline or other intrusions, does not exceed EC water quality standards and would not result in failure to achieve the environmental objectives in associated surface waters or terrestrial ecosystems.

2.4. Related baseline method statements

2.4.1. In addition to this groundwater modelling method statement, method statements have also been prepared for undertaking baseline hydraulic modelling, water quality modelling and Water Framework Directive (WFD) compliance assessments. Furthermore, the biodiversity assessments will need to both inform and to draw on the findings of the groundwater modelling, as

appropriate. The interdependency between the methods outlined in these statements and the groundwater modelling methodology is acknowledged. Close engagement will ensure that each modelling approach is informed by and informs the others, to ensure a consistent and coherent approach to impact assessment.

2.5. Document outline

2.5.1. The remainder of this document sets out to initially provide all the relevant background information in terms of (i) the proposed scheme, (ii) relevant policy and guidance, (iii) current and future data sources (iv) scope of the modelling work and (v) options for impact assessment.

3. Scope

3.1. Location

3.1.1. A brief overview of the development is provided here to establish terminologies and understandings that will assist with the review of this method statement. For more details, the reader is referred to the Heathrow Expansion website[1]

3.1.2. A map of the area surrounding Heathrow airport is presented in Figure 18.2.1. Note that the boundary indicated is that for the current airport.

3.2. Interaction of construction components with groundwater receptors

3.2.1. From a groundwater perspective, the main construction and operational elements of interest are:

- How short-term construction related activities, e.g. the creation of coffer dams or sheet piling and the development of borrow pits, may affect local groundwater flow during the construction phase
- How new or relocated permanent engineered structures, e.g. re-designed and or re-purposed landfill sites, basements, tunnels, pipelines and any other sub-surface structures (e.g. an airfield drainage network) may affect groundwater levels and flow direction in the longer term (i.e. during the operational lifetime of the airport)
- Whether any changes in the permeability of sub-surface fill material may affect groundwater movement
- How the realignment of rivers and other surface water bodies and any flood storage areas that might be created may impact on local groundwater levels
- How the extraction of usable construction grade gravels will affect groundwater level conditions
- Understanding how potential changes in groundwater flow regime may affect:

[1] https://www.heathrowexpansion.com/

    - The spatial extent and rate of baseflow accretion in the new and existing river courses
    - The spatial extent and rate of discharge of groundwater into other areas that are not defined by river courses, providing information about likely groundwater flooding.
- To use predictions of changes in flow regime, combined with an understanding of groundwater quality, to assess whether there is the potential for a change in the quality of groundwater which emerges in various surface water bodies.

3.3. Groundwater receptors that potentially interact with construction components

3.3.1. It is anticipated that a groundwater model will support the ES with respect to the likely (pre-mitigation and post-mitigation) effects of the proposed development (both construction and operational phases) on key environmental receptors, as well as associated temporary works.

3.3.2. A list of potential environmental receptors is presented in Table 18.2.1.

3.3.3. Other receptors (i.e. not explicitly environmental) may include

- The project elements highlighted above
- Surrounding third-party sub-surface infrastructure
- Residential (or otherwise) properties with basement structures that may intercept the local groundwater table
- Groundwater abstractions - both licensed and unlicensed abstraction locations, including sources for public water supply
- The Source Protection Zones associated with public water supply abstraction sources (i.e. boreholes)
- Deregulated and private groundwater supply abstractions
- Surface Water abstractions - both licensed and unlicensed, that may be influenced by groundwater interaction with watercourses.

Receptor Type	Sites
Groundwater Aquifers	EU WFD groundwater bodies, namely: • The Lower Thames Gravels; and • The Cretaceous Chalk. The groundwater model could itself be used to assess the effects of any artificial recharge to ground. It is also likely that the final assessment will take account of how pumped water (dewatering) is managed in terms of discharges to surface water (volumes of water) and/or groundwater.
WFD Surface Water Bodies	WFD surface water bodies that could potentially interact with groundwater If required, a groundwater model could allow the effects of groundwater discharge to be examined.
EU Drinking Water Protected Areas	Lower Thames Gravels Groundwater Body
Sites designated for biodiversity, and other relevant areas of habitat	Sites that could potentially interact directly with groundwater, e.g. Stanwell Moor. Sites that could be indirectly affected by groundwater or river flow impacts downstream, including the Groundwater Dependent Terrestrial Ecosystem (GWDTE) at Wraysbury.
Other Small Surface Water Features	Site such as small springs, ponds and drainage ditches

Table 18.2.1 List of Potential Environmental Receptors

4. Previous Investigations

4.1. Previous modelling work

4.1.1. Through the development of our groundwater baseline study, we are aware that the Environment Agency has undertaken regional scale hydrogeological conceptualisation and modelling of the Chalk aquifer surrounding and underlying Heathrow Airport. A summary of this modelling work undertaken and the applicability of each study to the current study, is provided in Table 18.2.2.

4.1.2. The locations of the known existing regional groundwater resource model boundaries surrounding Heathrow Airport are presented in Figure 18.2.2. These models have been developed for the purposes of water resource management and to support its obligations under national and European legislation, including (but not limited to) Catchment Abstraction Management, EU Water Framework Directive (2000/60/EC), the Groundwater Daughter Directive (2006/118/EC) and the Habitats Directive (92/43/EEC).

Groundwater Modelling Study	Description	Benefits to current study	Limitations to current study
The London Basin (Environment Agency)	All – regional groundwater resources models built for regulatory purposes – such as assessing the impact of groundwater abstraction on river courses and groundwater dependent ecosystems.	All - Associated conceptual and numerical studies that provide up to date conceptual thinking with regards to the underlying Chalk aquifer. Would also be possible to request supply of compatible numerical output to support the setting of relevant boundary conditions in the Heathrow model.	All - do not include the superficial river terrace deposits or underlying gravels in the numerical model. Chalk models only, albeit with alternative approaches to simulation of the overlying deposits (for the purposes of groundwater recharge assessment).
The South West Chilterns (Environment Agency)			
The Middle Thames (Environment Agency)			
The River Mole and Wey (Environment Agency)			

Table 18.2.2 Relevant groundwater modelling studies

5. Proposed Methods

5.1. Current data requirements

5.1.1. As part of the ongoing work, available hydrogeological desk study data are being collated and analysed to facilitate the formulation of the ES baseline and underpin the initial build of the accompanying groundwater model.

5.1.2. Additional geological and hydrogeological information is also being acquired during the current programme of intrusive works, and these data will also need to be captured, processed and interpreted in a consistent way to formulate an updated hydrogeological conceptual model of the site, and to inform the revised numerical model.

5.1.3. The key datasets (and their priority) that are required for use in the model are identified in Table 18.2.3.

Data Type	Description	Use
Geological stratigraphy	The elevation of geological horizons for at least the main gravel aquifers	Model definition
Geological stratigraphy (BGS GeoIndex data)	Online datasets of historical records	Model definition
Geological cross sections	Any previous interpretation of geological data that can be cross validated with new borehole data	Model definition
Groundwater levels	Water level hydrographs and contour maps for representative period	Calibration
River, pond hydrographs	River gauges, pond levels, spring locations	Calibration
Unsaturated zone thickness	Contour maps for representative time periods.	Calibration
Vertical head difference	Between gravels and Chalk for representative time periods	Calibration
Hydraulic parameters	Aquifer parameter spatial distribution maps.	Model parameterisation
Rainfall and potential evaporation	Daily rainfall, weekly MORECS evaporation	Used to determine groundwater recharge
Land Use	Spatial maps of main land uses, as defined by	Used to determine groundwater recharge

Data Type	Description	Use
	the CEH Land Cover Map	
Location of active and historic landfill	Maps of main sites, plus any known construction details	Used to adjust groundwater recharge to aquifer
Location of existing gravel extraction sites	Spatial locations, and associated reports	Identification of additional areas of open water (associated ponds, lakes etc)
Topography (pre- and post- construction)	E.g. LiDAR data, Spatial raster and/or contours	Model top surface boundary
Anthropogenic recharge	Recharge due to human activity (i.e. discharges to ground, mains leakage)	Boundary conditions
Groundwater abstractions	Details of locations, construction and historical and current abstraction rates (monthly)	Boundary conditions
River flows and morphology	For permanent and newly installed flow gauge locations	Model calibration (groundwater/surface water interaction)
Surface water bodies	Location and depths of significant water bodies (rivers, streams, ponds), river bed properties	Boundary conditions

Table 18.2.3 Data requirement for groundwater modelling purposes

5.2. Recharge estimation

5.2.1. Consideration has been given to whether separate surface water process modelling of spatial and temporal variations in groundwater interactions is required to meet the needs of the impact assessment, with the various groundwater recharge modelling options summarised in Table 18.2.4.

5.2.2. Currently, it is considered that a single long-term average estimate of groundwater recharge is unlikely to offer sufficient flexibility to assess how environmental effects may differ as a function of the seasonal variation of recharge, or indeed future climate.

5.2.3. Therefore, spatially and temporally variable estimates of groundwater recharge are proposed, to inform the development, and to achieve calibration, of a transient groundwater model.

5.2.4. To develop a runoff and recharge model, the following data are required:

- Daily rainfall which covers the calibration period (sourced from the Met. Office);
- Met. Office 'MORECS' potential evapotranspiration for reference grass, with at least a weekly resolution;
- Land use data, such as the European Environment Agency's 'CORINE' Land Cover dataset, to determine major grouping of land use, such as arable, wetland or woodland; and
- Soils data, such as the Cranfield Soil and AgriFood Institute's LandIS – Land Information System soils dataset which comprises soil classifications based upon texture, composition and origin.

5.2.5. We intend that the construction of the recharge model will be undertaken using Wood's modelling code, 4R. The code, developed in conjunction with the Environment Agency, has the benefit of regulatory approval and has already been used in a wide variety of modelling studies.

5.2.6. This variety refers not only to hydrological and geological environments, but also to cases where the level of data availability and existing knowledge have varied from sparse to detailed, and where the required understanding may be on a regional or local basis.

Options	Benefits	Disadvantages
Single long-term average groundwater recharge estimate (based on studies by the Environment Agency)	Exists already – no extra processing required	Offers no opportunity to assess variation in impact on a seasonal or potential driest drought/wettest winter basis
Spatially varying average recharge (based on 4R model)	Function of land use type, geology, rainfall and potential evapotranspiration (PE) variation	No temporal variation would limit the application to a transient model. No routing, therefore addition of runoff would be a post processing exercise
Spatially and temporally varying recharge sequences (based on 4R model)	Helps with transient runs, determining seasonal impacts, helps with climate change scenarios	Requires processing of both time series of rainfall and PE datasets, in addition to spatial distributions of land use, soil etc
Fully routed surface water runoff and recharge model (based on 4R model)	Fully routed stream network linked to underlying groundwater model. Enables surface water impact simulation at all locations	Although detailed, may be uncertain calibration, given lack of long term gauging data at more than a few locations

Table 18.2.4 Options for the calculation of groundwater recharge

5.3. Available groundwater modelling codes

5.3.1. Table 18.2.5 summarises the features of the two hydrogeological modelling codes considered appropriate against requirements for performance of the current study – namely FEFLOW (Diersch, 2014) and MODFLOW-USG (Panday et al, 2015).

5.3.2. Both are available either freely or commercially, have public domain user and verification manuals, and have been used in many peer reviewed environmental studies.

5.3.3. The modelling will require representation of multiple geological layers, engineering structures and mitigation measures. There will also potentially be the need for increased levels of grid mesh detail around key features, such as engineering structures and linear or small receptors.

5.3.4. Finite-element models such FEFLOW support flexible 3D gridding to achieve this, while MODFLOW-USG uses a finite volume approach, which has proven successful in other infrastructure projects of this nature.

5.3.5. Note however, that surface water-groundwater interactions can be easily integrated within MODFLOW-USG, whereas FEFLOW requires integration with separate surface hydrology models to represent such interactions in detail.

5.3.6. As such, the use of MODFLOW-USG is preferred, given its proven ability to simulate both groundwater-surface water interaction and to accumulate and route surface water flow through a defined surface channel network, without the requirement for additional third-party software.

5.3.7. In addition, MODFLOW-USG is already supported by a well-established runoff and groundwater recharge model, which has been developed previously in association with the Environment Agency. Use of such a combination of modelling codes in the UK is familiar to the Environment Agency, and as such should offer substantial reassurance to the regulator that the modelling approach is appropriate and credible.

Criteria	FEFLOW	MODFLOW-USG
Used in related studies?	Application in the UK to large construction projects, principally in the nuclear sector	Applied to large regional scale water resource studies in the UK which also require local refinements. Examples of application to assessment of impact on the installation of complex sub-surface infrastructure
Existing Heathrow specific model?	No	No
Existing neighbouring models that may support current proposals	No	Yes – three regional scale groundwater resource models developed by the Environment Agency 1. The London Basin 2. The Middle Thames 3. The South West Chilterns Also supporting conceptual understanding developed under the 4. The River Mole and Wey Conceptual and Numerical Modelling Study
Is the model code accepted/established?	Yes	Yes
Can the model represent conceptual groundwater flow systems (multi-layered aquifers)?	Yes	Yes
Can structures and mitigation measures be represented?	Yes	Yes
Particle tracking?	Yes	Yes, via use of MODPATH
Variable saturation?	Yes	Yes
Steady-state flows?	Yes	Yes
Time varying flows?	Yes	Yes
Surface flows?	MIKE interface required – and routing of streams not easily achieved	Fully integrated with “4R” runoff and recharge code. River

Criteria	FEFLOW	MODFLOW-USG
		diversion and bifurcations require manual adjustment
Automatic method of model calibration available?	Yes - FEPEST	Yes - PEST interface
Can the model be developed in the project time frame?	Possibly, would require MIKE interface to sit with groundwater model – and which may require extensive development work in its own right,	Yes, open nature of software and experience of model construction within consortium, makes this the preferred option.
Can the model be used to assess changes in water level/flows at the identified receptors?	Yes, but MIKE-11 interface required to deal with surface water flows, which adds additional complexity	Yes, if combined with a distributed 4R runoff and recharge model, which enables accumulated surface water flow (and hence surface water impacts) to be determined at any point of stream network
If required, could the model be adapted to simulate contaminant transport?	Yes (advection, dispersion, sorption, decay)	Yes (advection)

Table 18.2.5 Relevant groundwater modelling studies

5.4. Groundwater Model Design

5.4.1. It is proposed that Heathrow groundwater model will be of sufficient extent to cover the entire outcrop of the Lower Thames Gravels Groundwater Body, such that its extent will fully encapsulate the key features of interest for this work, i.e. the required receptors. Where data are available, the geological representation used in the model will be updated to honour the site observations, where possible (Figure 18.2.3).

5.4.2. In a vertical sense, the model will be refined sufficiently to provide an accurate simulation of groundwater levels in the superficial gravels in the first instance.

5.4.3. However, given the potential for the interaction with the deep subsurface (as consequence of construction of deep foundations or excavation of existing landfill material), an appreciation of the underlying Lower London Tertiaries and the Cretaceous Chalk is also required.

5.4.4. Hydrogeological layering will be informed through the existing ground model being developed concurrently by the engineering teams. In addition, where possible within the timeframe for model construction envisaged, geological data from site investigations will also be used to inform the geological structure and aquifer properties of the river terrace deposits and silt and gravel aquifers that underlie the airfield and surrounding groundwater catchment.

5.4.5. In the same manner, the calibration of the model will use, as much as possible, current water level observation data that are forthcoming from the ongoing intrusive works and site investigations

5.4.6. Table 18.2.6 identifies a more complete range of proposed requirements of the DCO model.

5.4.7. Note, some elements of the Project may sit beyond the spatial extent of the Lower Thames Gravels Groundwater Body (e.g. to the north, where the Cretaceous Chalk is unconfined). In this instance, use of the Environment Agency's existing regional models is the proposed approach. This is a topic which will be discussed with the Environment Agency.

Model Feature	Proposal	Benefits/Meets Objectives?	Dependencies/Risks
Spatial Extent Figure 18.2.3	Full extent of the Lower Thames Gravels	Covers key sources/receptors and recharge/discharge locations	Need surface topography and geological layers for whole domain Wider extent for underlying Chalk aquifer may provide improved boundary conditions
Geological layering	Explicit model of river terrace deposits, silts and gravel aquifers, London Clay, Lower London Tertiaries and upper sections of Cretaceous Chalk (20-50 m)	To better describe vertical partitioning of groundwater flow between aquifer/aquitard layers	Need to interpret drilling logs for multiple datasets. However, opportunity to use existing interpretative work undertaken by the Environment Agency, as part of their regional groundwater resource modelling work
Depth	50 m below contact with base of London Clay, to include Lower London Tertiaries and upper section of Cretaceous Chalk	Deep enough to not artificially restrict flow circulation and consistent with location of lower permeability bedrock	-
External boundary conditions	General or fixed flux boundaries on sides and bottom – dependant on extraction of relevant data from regional models (EA). Recharge/discharge on top (spatially varying)	Consistent with natural flow boundaries and available recharge/discharge data	Data required for spatially/temporally varying recharge, but could just be used for model calibration

Model Feature	Proposal	Benefits/Meets Objectives?	Dependencies/Risks
Internal boundary conditions (e.g. rivers)	Main watercourses to be represented in relation to groundwater water/surface water interaction	Provides a more accurate baseline of groundwater levels and river interaction. Allows effects of development on receptors to be investigated	Data required on river level, river bed level and river flows – which is available through Environment Agency flood modelling work
Time varying (versus steady state)	Model time variations in groundwater levels due to fluctuations in recharge	Reduce uncertainties in model parameterisation and improve predictive capability by calibration on drainage/wetting of subsurface according to seasonal precipitation patterns	Need meteorological data, recharge model, and ideally >1 yr continuous monitoring in areas of interest (main receptors)
Abstractions	Include current groundwater abstractions	Provides a more accurate baseline of groundwater levels in and around supply well receptors	Requires data on completions, abstractions and monitoring of supply wells – data requests submitted to the Environment Agency
Level of horizontal discretisation	Potential for extra refinement around key receptors and engineering structures causing dewatering or mitigation measures	Gives greater accuracy around features of interest	Greater refinement increases model size and run times

Table 18.2.6 Proposed Groundwater Model Design

5.5. Model Calibration

5.5.1. Model calibration is the process of establishing values or ranges of input parameters that ensure the model predicts system behaviours which are consistent with measurements whilst remaining credibly founded on the established conceptual understanding. As such, the process increases reliability of the model to predict the real groundwater system.

5.5.2. Important characteristics that a model should honour include the spatial distribution of groundwater levels, both horizontal and vertical, as these govern directions and magnitudes of flow, and responses to changes in internal boundary conditions e.g. either from recharge or abstractions.

5.5.3. Calibration on groundwater level data involves finding an appropriate ratio between hydraulic conductivity and available recharge. Making use of groundwater heads from boreholes which are screened in different geological layers to calibrate the model helps to provide greater confidence in model values of vertical hydraulic conductivity and representation of the anisotropy of the system.

5.5.4. Modelling of the groundwater response to variations in recharge will also allow further refinement of aquifer parameters (hydraulic conductivity and storage coefficient).

5.5.5. The primary data available for hydrogeological calibration will be groundwater levels in monitoring boreholes. A detailed list of monitoring points that will be used to assess model calibration will be developed once the initial data collation phase of the project has been completed.

5.5.6. There will be several stages to achieving an ‘acceptable’ degree of model calibration (Table 18.2.7). However, as a first step, steady state calibration under ‘average’ recharge conditions offers an important baseline calibration of hydraulic conductivities.

5.5.7. As such, it is proposed that average (steady-state) conditions will again be used to calibrate the model initially, using median groundwater levels which are usually less susceptible to anomalous readings. Emphasis will be placed on matching measurements close to receptors and areas where the most significant engineered structures are to be installed;

5.5.8. Known abstractions that have taken place during the monitoring periods will also be included as boundary conditions in the steady-state calculations;

5.5.9. Since the ES is concerned with predicting the effects of change, it will also be of interest to model natural changes, such as responses to seasonal variation in recharge or groundwater abstraction. A time-varying model that simulates the change and its effects compared to measured head time-series is therefore an important second level of model calibration:

5.5.10. The observed groundwater level data will be analysed to determine the seasonal variation in groundwater heads for different aquifer units and this will be compared with calculated recharge rates.

5.5.11. A final stage of confidence assessment of the model will be to sense check the model's predictions of surface water interactions, such as the locations and volumes of discharges (or recharge from) to rivers, streams, ponds and springs in the area under different recharge conditions, and as compared to mapped surface water features.

	Data source	Modelling approach	Reporting
Average groundwater levels	Monitoring boreholes	Steady-state calculation of head based on average recharge to reduce uncertainty in hydraulic conductivities	Plots of modelled and calculated heads by borehole and cross-plots. Quantify using difference between measured and calculated heads
Time-varying groundwater levels	Monitoring boreholes near receptors or between them and engineered structures with time-varying data over a sufficient period	Transient calculation of head based on time-varying recharge over the duration of the monitoring data to reduce uncertainty in hydraulic conductivities and specific yield/storage	Plots of modelled and calculated heads in selected boreholes as a function of time. Quantify using mean differences between calculated and measured values
GW-SW interaction	River hydrographs, pond levels, spring locations	More qualitative comparison of modelled discharge to rivers, streams, modelled surface recharge/discharges versus surface water features	Plots of stream hydrographs and of recharge/discharge areas compared to mapped surface water features

Table 18.2.7 Model Calibration Stages

5.6. Scenario Testing and Sensitivity Analysis

5.6.1. Having developed and calibrated the model on measured site conditions, it will then be used to assess the effects of engineering structures and activities on receptors, and where those are significant to assess the performance of mitigation measures to reduce the effects.

5.6.2. During consultation with the Environment Agency and Natural England, and in conjunction with the biodiversity assessment team, it will be necessary to agree assessment parameters and criteria for the various receptors.

5.6.3. The main features that will be represented by the model are as follows:

- The realignment of the river courses, and their river bed properties
- Construction of subsurface infrastructure (e.g. coffer dams or piling) associated with the realignment of the M25 or other major roads
- Construction of other large basement structures associated with other major construction activities, where these have been identified as having the potential to affect groundwater flow-paths within the gravel aquifer (e.g. terminal buildings, attenuation tanks etc)
- Temporary, but large scale, dewatering activity during the construction phase
- Changes in land use (where this results in less direct recharge to groundwater e.g. introduction of impermeable hardstanding, or the construction of new flood mitigation areas)
- Changes in land surface elevation, where there is a potential for this to increase the risk of groundwater flooding.

5.6.4. The effects will be quantified using a carefully defined set of scenarios (either steady state or transient, depending on the duration of engineering activity) that represent the engineering features. It is important that these scenarios are realistic in capturing essential aspects of the engineering likely to have an effects, such as the level of dewatering and/or extent of excavations. However, it is accepted that some aspects of the design may be uncertain (e.g. depths or durations of dewatering), and so the definition of scenarios will make cautious, but still reasonable, bounding assumptions on such aspects. This will include taking in to consideration the Limits of Deviation as they are developed.

5.6.5. The activities and how they will be represented within the model will be discussed and agreed with the key stakeholders as the work develops.

5.6.6. However, the effects on groundwater may include the following:

- Changes in groundwater levels and groundwater flow direction due to dewatering during construction
- Reduction in recharge to the water table (e.g. construction of low permeability surfaces such as hardstanding, placement of spoil mounds)

- Changes in groundwater flow due to the construction of low permeability barriers below the water table (e.g. sheet pile walls, coffer dams, tunnels and basements that penetrate the gravel aquifer), as well as high permeability ‘drainage’ corridors
- Lowering of groundwater levels where the proposed post-construction grade (i.e. land surface elevation) is below the existing water table.

5.6.7. The likely effects on receptors will be quantified in terms of the following:

- Changes in groundwater head from the baseline condition
- Changes in groundwater inflows and outflows to rivers and other surface water features
- Changes in groundwater movement and potentially the use of particle tracks to examine changes to the movement of existing groundwater contamination.

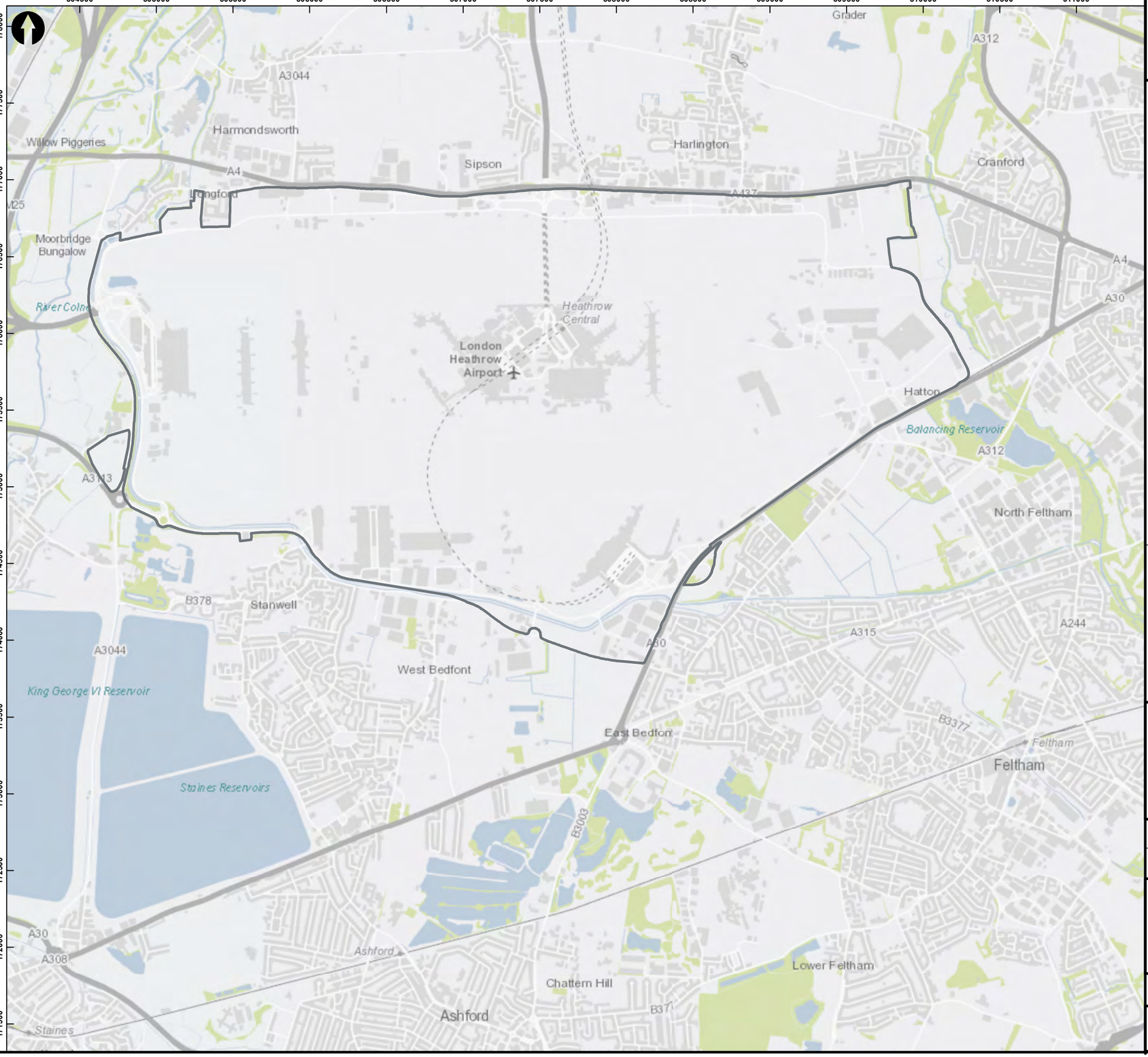
5.6.8. Due consideration will also be given to overall model uncertainty (e.g. parameters or geological layering) between the engineered structures and receptors using suites of scenarios that utilise different hydrogeological assumptions.

6. Glossary

Term/ abbreviation	Description
DCO	Development Consent Order
EA	Environment Agency
ES	Environmental Statement
HAL	Heathrow Airport Limited
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HEP	Heathrow Expansion Programme
NSIP	Nationally Significant Infrastructure Project
NPS	National Policy Statement
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
WFD	Water Framework Directive

7. Bibliography

Creator	Title	Publisher and place of publication	Date of publication
Hans-Jörg G. Diersch	FEFLOW - Finite Element Modeling of Flow, Mass and Heat Transport in Porous and Fractured Media	Springer, Berlin, Heidelberg https://doi.org/10.1007/978-3-642-38739-5	2014
Panday, Sorab, Langevin, C.D., Niswonger, R.G., Ibaraki, Motomu, and Hughes, J.D	MODFLOW-USG version 1.3.00: An unstructured grid version of MODFLOW for simulating groundwater flow and tightly coupled processes using a control volume finite-difference formulation	U.S. Geological Survey Software Release, http://dx.doi.org/10.5066/F7R20ZFJ	2015



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Heathrow Planning Boundary

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Metres

Scale 1:25,000

Heathrow

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Scale 1:25,000	
Project Name: Heathrow Expansion Project	Heathrow Project No.: HEP53

Title

Figure 18.2.1: Current Heathrow Planning Boundary

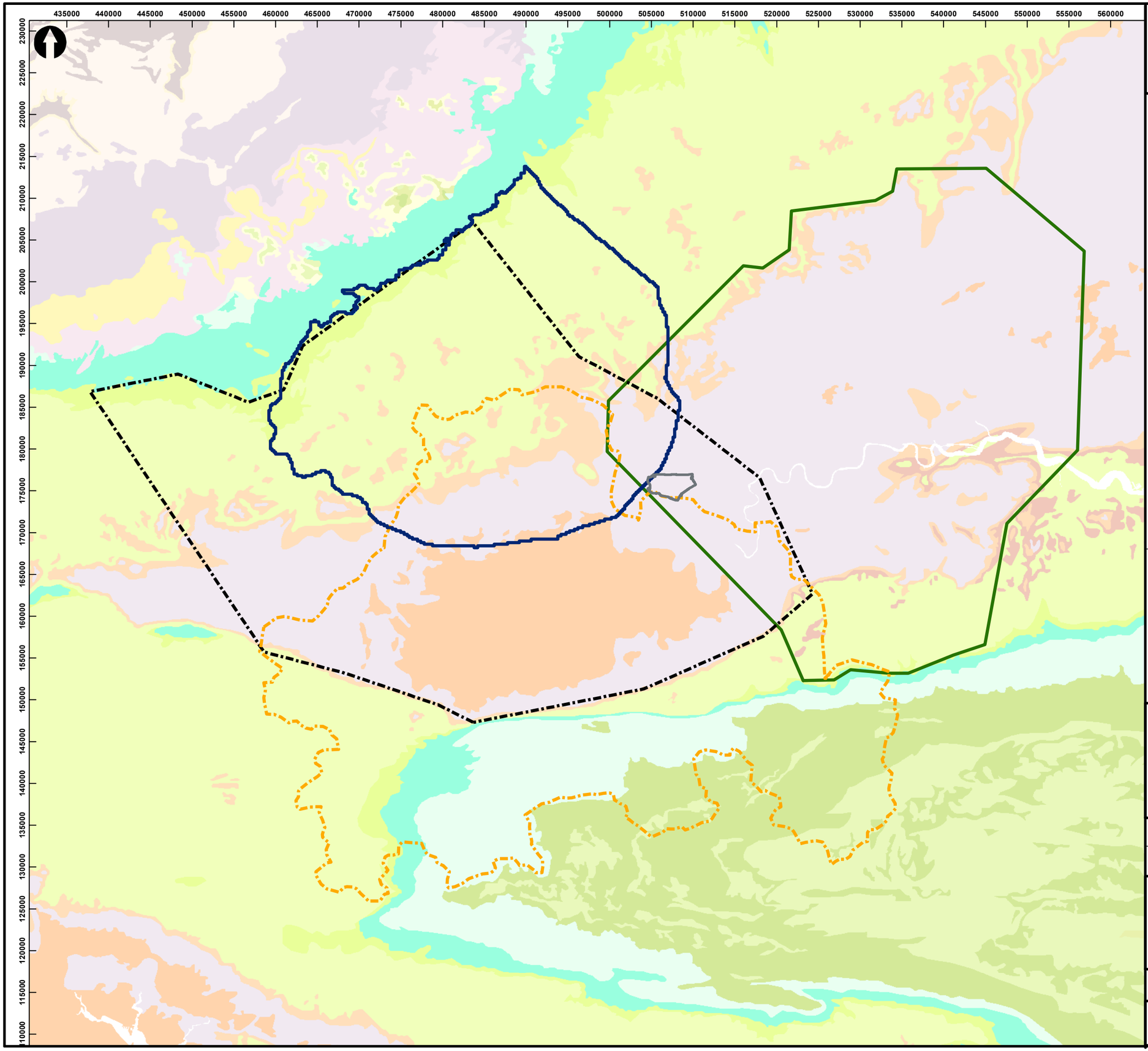
Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	GREES	STONN	10/05/2018	FINAL

Location-Level-Sub Series/System-Identifier	Version
HEP53-XX-GA-XXX-000158	1.0

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Heathrow Planning Boundary
South West Chilterns
Mole
Middle Thames
London Basin

Bedrock Geology

- BRACKLESHAM GROUP AND BARTON GROUP (UNDIFFERENTIATED) - SAND, SILT AND CLAY
- THAMES GROUP - CLAY, SILT, SAND AND
- THANET SAND FORMATION - SAND, SILT AND CLAY
- LAMBETH GROUP - CLAY, SILT, SAND AND
- GREY CHALK SUBGROUP - CHALK
- WHITE CHALK SUBGROUP - CHALK
- GAULT FORMATION AND UPPER GREENSAND FORMATION (UNDIFFERENTIATED) - MUDSTONE, SANDSTONE AND LIMESTONE
- LOWER GREENSAND GROUP - SANDSTONE AND MUDSTONE
- WEALDEN GROUP - MUDSTONE, SILTSTONE AND SANDSTONE
- WEALDEN GROUP - SANDSTONE AND SILTSTONE,
- PURBECK LIMESTONE GROUP - LIMESTONE AND MUDSTONE,
- PORTLAND GROUP - LIMESTONE AND CALCAREOUS SANDSTONE
- CORALLIAN GROUP - LIMESTONE, SANDSTONE, SILTSTONE AND MUDSTONE
- WEST WALTON FORMATION, AMPTHILL CLAY FORMATION AND KIMMERIDGE CLAY FORMATION (UNDIFFERENTIATED) - MU
- KELLAWAYS FORMATION AND OXFORD CLAY FORMATION (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
- GREAT OOLITE GROUP - SANDSTONE, LIMESTONE AND ARGILLACEOUS
- INFERIOR OOLITE GROUP - LIMESTONE, SANDSTONE, SILTSTONE AND MUDSTONE
- LIAS GROUP - MUDSTONE, SILTSTONE, LIMESTONE AND SANDSTONE

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Heathrow

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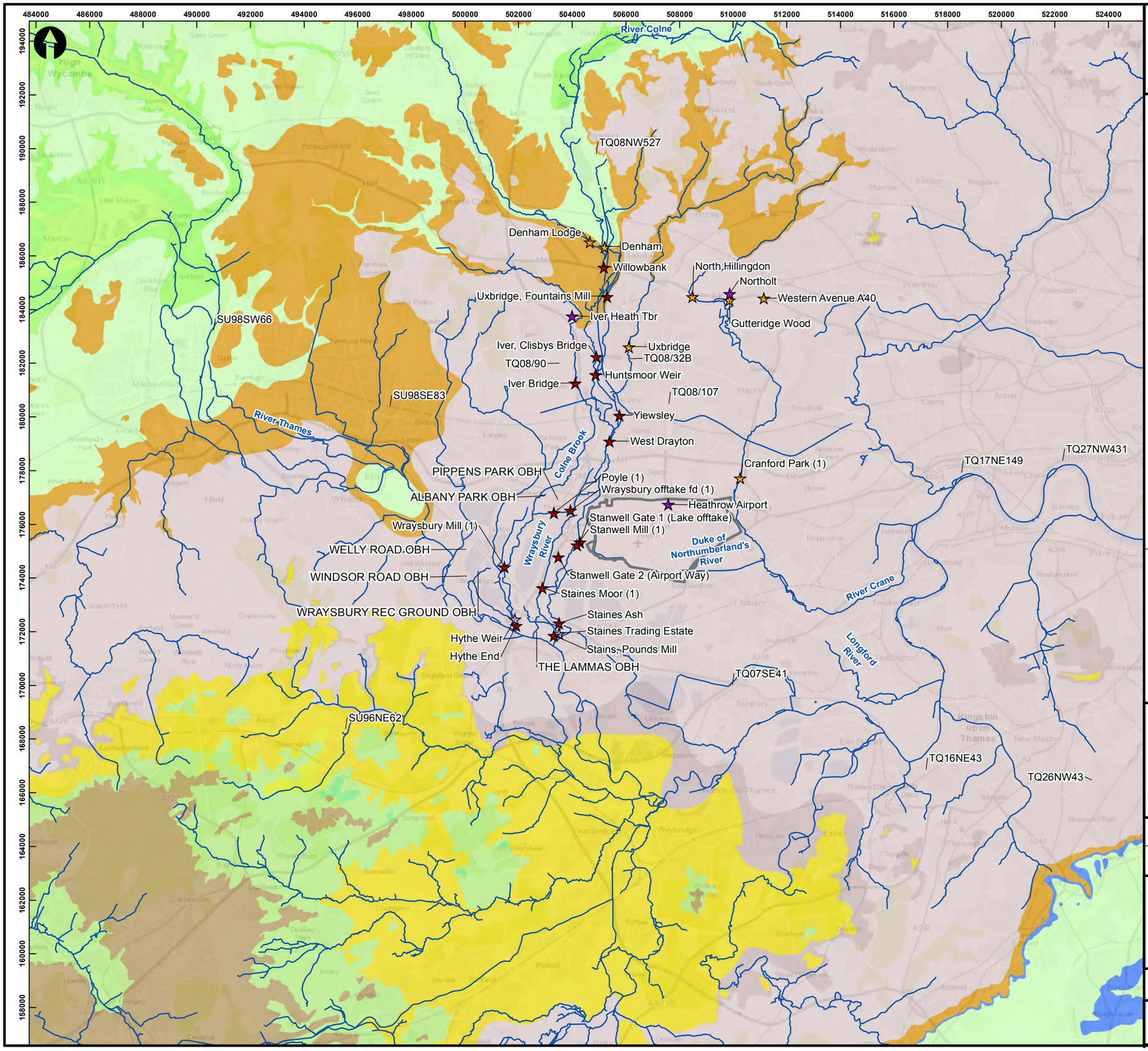
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Figure 18.2.2: Environment Agency Regional Groundwater Models (2017)

Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	GREES	STONN	21/05/2018	FINAL

Location-Level-Sub Series/System-Identifier	Version
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- Heathrow Planning Boundary
- CAMBERLEY SAND FORMATION - SAND
- BAGSHOT FORMATION - SAND
- CLAYGATE MEMBER - CLAY, SILT AND SAND
- CLAYGATE MEMBER - SAND, SILT AND CLAY
- LONDON CLAY FORMATION - CLAY AND SILT
- LONDON CLAY FORMATION - CLAY, SILT AND SAND
- ST ANN'S HILL PEBBLE BED - GRAVEL
- STANNERS HILL PEBBLE BED - GRAVEL
- SWINLEY CLAY MEMBER - CLAY
- WINDLESHAM FORMATION - SAND, SILT AND CLAY
- LAMBETH GROUP - CLAY, SILT AND SAND
- THANET FORMATION - SAND
- SEAFORD CHALK FORMATION AND NEWHAVEN CHALK FORMATION (UNDIFFERENTIATED) - CHALK
- LEWES NODULAR CHALK FORMATION - CHALK
- LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION AND NEWHAVEN CHALK FORMATION (UNDIFFERENTIATED) - CHALK
- NEW PIT CHALK FORMATION - CHALK
- Watercourse
- River Flow Gauge
- River Level Gauge
- River Flow and Level Gauge
- Rainfall Gauge

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Scale 1:140,000

Heathrow

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Figure 18.2.3: Proposed extent of the Heathrow Groundwater Model for discussion with Environment Agency

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Wood	GREES	STONN	10/05/2018	FINAL

Location-Level-Sub Series/System-Identifier	Version
HEP53-XX-GA-XXX-000160	1.0

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Appendix 18.3
Surface water quality modelling Method Statement

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Internal



Heathrow Expansion Project

Surface water quality modelling Method Statement

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Author: [redacted]

Role: Water Quality modelling leads

Date: 23/02/2018

Version: 2

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1	11/11/2017	First full draft
2	23/02/2018	Second draft following internal technical review

Stakeholders

Name	Role
Name	Heathrow Environmental Assessment Manager Community & Green Spaces
Name	Environment Agency project manager
Name	Environment Agency Water Quality Planner

Checked by: Name: [redacted]

Role: Natural Environment EIA Workstream lead

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Glossary

Acronym	Meaning
WQ	Water Quality
SAGIS	Source Apportionment Graphic Image System (water quality mode)
SIMCAT	Water quality model
RQP	River Quality Planning (water quality model)
EQS	Environmental Quality Standard
ha	hectare
km^2	Square kilometre
WFD	Water Framework Directive
SPA	Special Protected Area
SEPA	Scottish Environment Protection Agency
UKWIR	UK Water Industry Research
ISIS	Catchment water quality model
EA	Environment Agency
STW	Sewage Treatment Works
CSO	Combined Sewer Overflow
HRT	hydraulic retention time

1. Introduction

1.1. Purpose of this report

1.1.1. The Heathrow Expansion Project (referred to as the Project for the rest of this document) is a major infrastructure project in the Southeast of England. The Project will include the construction of a new runway along with ancillary developments to support the expansion. The construction and operation of the new runway and associated infrastructure has the potential to impact on several aspects of the environment including water quality. In order to demonstrate that water quality effects on surface waters from the construction and operational phases of the Project are negligible, can be avoided or can be appropriately mitigated, it is necessary to identify the scale of any potential effects.

1.1.2. This report sets out the methodologies that will be used for the surface water quality modelling to support the Project. Specifically, this report focuses on the modelling of water quality in the river catchments, lakes and reservoirs that are likely to be affected by the Project.

1.1.3. The document also uses data from the Surface water quality baseline report and supports the scoping report by indicating the proposed approach for supporting the assessments for the EIA.

1.1.4. This report is structured as follows:

1. Section 2 describes the water quality models that will be utilised and the development of the proposed methodology;
2. Section 3 provides the methodology for modelling river catchments; and
3. Section 4 provides the methodology for modelling lakes and reservoirs.

1.1.5. A description of the Project is provided in Chapter 3 of the Scoping report.

1.2. Heathrow Expansion Project and surface waters

1.2.1. The main aspects of the project that could potentially impact on surface water quality and could require modelling include:

1. Short-term construction related activities, e.g. changes to surface water drainage and release of pollutants or sediment;
2. Changes to groundwater and surface water interactions;
3. Changes to the alignment of rivers and other surface water bodies and any flood storage areas that might affect sources, pathways or receptors;
4. Effects from onsite operational activities (e.g. increased atmospheric deposition, new or increased discharges); and
5. General effects from physical changes to rivers or other surface waters.

1.2.2. The Project could impact on the Colne and Crane catchments as well as other surrounding surface water features e.g. the reservoirs, lakes, Duke of Northumberland's river and Longford River. As such, and in line with the surface water quality baseline, the water quality modelling will look at the effects on the

surface water environment in four distinct assessment areas, which lie within the scoping study areas (as shown in Figure 18.3.1):

1. Colne assessment area (including River Colne, Horton Brook, Wraysbury River, Colne Brook, Duke of Northumberland's river, Longford River and Surrey Ash)
2. River Crane assessment area;
3. River Thames assessment area; and
4. Reservoirs and Lakes assessment area (e.g. Thames Water drinking water reservoirs and Wraysbury lake).

1.3. Objectives

1.3.1. There are two main objectives for the water modelling:

1. Establishing the baseline water quality of the river catchments in order to assess the potential effects of changes in nutrients and chemicals. This will help with the assessment of compliance against relevant water quality Environmental Quality Standards (EQSs) including Water Framework Directive (WFD) standards.
2. Establishing baseline nutrient budgets of relevant lakes and reservoirs and to assess the potential effect of changes in their nutrient concentrations and loadings due to the Project. This will help with the overall assessment of the effects on the Southwest London waterbodies Special Protected Area (SPA)[1].

[1] This includes Staines Moor SSSI, the Wraysbury and Hythe End Gravel Pits, Wraysbury No. 1 Gravel Pit and Wraysbury Reservoir

2. Water Quality modelling

2.1. Overview

2.1.1. Two different models will be used in order to fulfil the above objectives. This is based on the differing needs and surface water features that will be modelled. Both models will use available catchment data on nutrient and chemical sources and pathways to simulate current and future concentrations in rivers, lakes and reservoirs. By varying the determinand sources, concentrations and any changes to pathways, the models can simulate concentrations under possible changes due to the Project.

2.1.2. The primary model used on the Project will be the River catchment model. This will provide information on the baseline as well as impact assessments of the majority of the construction and operational aspects of the Project.

2.1.3. A second model will be used for assessing effects on water quality in the reservoirs and lakes, particularly in relation to operational effects. Input to this model will be dependent upon the output from the river catchment model as the Thames Water reservoirs are fed from the Thames, while the Wraysbury No.1 gravel pit is connected to the Horton Brook. This will also help ensure that the models are linked as much as is feasible by providing data from the river catchment model to help calculate the nutrient budgets for the lakes.

River catchment modelling

2.1.4. For this part of the modelling, Simcat (taking data from SAGIS) has been chosen, as this is the tool employed routinely by the Environment Agency for planning, permitting and regulatory guidance. A benefit of this is therefore continuity with a model already in use, based on the same datasets and the same format as those applied for regulatory assessments conducted by the Environment Agency.

2.1.5. Simcat was also chosen preferentially over models such as ISIS because it is possible to alter river structures and determinand inputs within it in a way that can emulate the potential changes to water quality that could occur due to the impacts from the Project. ISIS is largely used by the Environment Agency and others to model river flows to investigate the effects of hydrological changes or restrictions to watercourses. However, changes to river flows can also be emulated in Simcat. Additionally a benefit of using Simcat is that a calibrated (at basin scale) model already exists, whereas using models such as ISIS would require duplicating the effort that has gone into the national Simcat model. As such Simcat was selected as the primary model for undertaking the river water quality assessments.

2.1.6. UKWIR, EPA and the Environment Agency funded the development of a Source Apportionment GIS model (SAGIS) to quantify the loads of pollutants to surface waters in the UK. Pollutant loads are converted to concentrations using the Simcat water quality model which is incorporated within SAGIS to allow

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quantification of the contribution of 12 types of point and diffuse sources (including wastewater treatment works discharges, intermittent discharges from sewerage and runoff, agriculture, soil erosion, mine water drainage, septic tanks and industrial inputs) to in-stream concentrations. Simcat modelling allows assessment of the compliance or possible exceedance of EQSs by modelling multiple substance concentrations under different scenarios and apportioning substances concentrations by source, to mitigate possible deterioration or allow targeted improvements where necessary.

2.1.7. Additionally the catchment model will be supplemented with the use of the River Quality Planning tool (a basic single site monte-carlo water modelling tool) and also, if required, qualitative assessments of impacts. These methods will be used for specific site based queries that cannot be easily answered by the catchment model or where the number and types of questions require a greater deal of flexibility. This is likely to be primarily in relation to intermittent discharges (e.g. dewatering, or runoff during storm related events) during the construction phase, but could also include intermittent discharges during the operational phase of the Project. The scale of these more site-specific assessments will be driven by the details of land use changes, the results of all the 2018 surface water and groundwater monitoring programmes and also any requirements to feed in to other assessments such as land quality or biodiversity.

2.1.8. Table 18.3.1 shows the types of discharges (both continuous and intermittent) that could be reviewed as part of the catchment modelling alongside land use changes.

Discharge	Project phase	Comment
Groundwater dewatering	Construction	Could be scoped out of detailed modelling and WQ assessment work depending on permitting workstream. However, if site specific issues are identified then RQP modelling or similar assessments could be used to assess impacts on rivers to ensure EQSs are not breached and any permits are set appropriately
Mobile treatment plants (dewatering treatment)	Construction	As above for dewatering. Should be covered through permitting and construction management plans, but if required, would be supported through site specific assessments.
Mobile treatment plants (sewage)	Construction	As above for dewatering. Should be covered through permitting and construction management plans, but if required, would be supported through site specific assessments.
Surface water drainage	Construction	It is likely that the construction phase can be modelled through Simcat by land use changes
Surface water drainage	Operation	It is likely that the operational phase can be modelled through Simcat by land use changes
New discharges (continuous)	Operation	This could include new sewage discharges or other related continuous discharges, if required by the Project. If required, these could be assessed through the catchment model as they would be single location discharges.

Discharge	Project phase	Comment
Portable toilet facilities	Construction	Should not include a discharge and therefore would not need detailed modelling or water quality assessments

Table 18.3.1 Examples of potential types of point discharges that could occur during construction or operation of the Project.

Reservoir and lake modelling

2.1.9. In order to characterise the principal sources and pathways of nutrients to each reservoir or lake, conceptual models will be developed for each water body of interest. There are a number of potential sources and pathways for nutrients to these waterbodies, although not all will be applicable in each case.

2.1.10. Potential pathways to the reservoirs and lakes include:

1. Surface runoff from the wider topographic catchment to the lake or reservoir. This will not apply to embanked reservoirs, for which the catchment will extend only to the top of the bank and will thus include only a very small area;
2. Via groundwater, for reservoirs and lakes which are groundwater fed or hydraulically connected to groundwater;
3. Direct inputs, for example from birds or via fish populations, or in water pumped into reservoirs for storage, or through atmospheric deposition.

2.1.11. A conceptual model will be developed of each waterbody that identifies all applicable pathways for nutrients to the reservoir. This will include working with the groundwater modelling team to ensure that the conceptual models of the reservoirs and lakes are consistent with their understanding, and draw on all available information. All applicable sources of nutrients that could reach the waterbody via those pathways will then be identified, as described in Section 4.

3. River catchment methodology

3.1. Overview

3.1.1. The purpose of this methodology section is to describe the refinement, calibration and application of the Simcat model that will be used for the surface water investigation for the Project. Calibration of the model is necessary to ensure that it accurately represents the processes that are taking place in that specific waterbody area, upon which further simulation scenarios can then be modelled. The approach detailed below has been preferentially chosen because it has been used previously by the Environment Agency and adheres to good modelling practice.

3.1.2. The approach to calibration will use data from the Surface water quality baseline report and involve:

1. Checking that any discharge or flow features within the assessment areas are represented correctly with respect to their spatial location and supporting data;
2. Assessing performance of the model against available observed flow and surface water quality data; and
3. If necessary, calibrating the model with respect to flow and load (of chemicals) to improve model performance.

3.1.3. The overall objectives for the modelling will be to ensure that any potential effects on water quality from the Project are not significant and abide by relevant regulatory objectives including:

1. Concluding that the future development will not be likely to cause in-class deterioration of any WFD element either within the lifetime of the Project or beyond;
2. Show that there is likely to be sufficient environment capacity for future growth in the wider area (i.e. there will be less than 10% deterioration in water quality within WFD class, in line with aspirational targets set by the Environment Agency);
3. Show that the Project will not be likely to prevent receiving waters from reaching Good Ecological Status or Potential; and
4. Show that the Project will not be likely to lead to a breach of any EQSs or to significant deterioration in concentrations of water quality determinands beyond those covered by the WFD (e.g. nitrates in freshwaters).

3.1.4. The effects will be modelled and assessed at the sample point and then water body levels to ensure all requirements are met appropriately.

Relevant model component	Type of data - units	Description	Source	Date accessed	Available at present (Y/N)
Model structure	Feature locations – National Grid References or locations along river stretches	Rivers, Sewage Treatment Works, abstractions, industrial discharges, Combined Sewer Overflows, WFD water body boundaries, routine water quality monitoring locations	Environment Agency – SAGIS model	September 2017	Y
Flow calibration	River flow – m^3/d	Metered flow at gauging stations in the catchment	Environment Agency		Y
	Sewage Treatment Works flow – m^3/d	Discharge flow data of Sewage Treatment Works outfalls	Thames Water		N
	Accretion flow data	Flow in stream attributable to seepage, ground water discharge	Field monitoring		N
Water Quality calibration	Discharge quality for determinands – mg/l	Quality of effluent being discharged from water company Sewage Treatment Works outfall	Environment Agency	September 2017	Y
	River/Lake quality for determinands – mg/l	Concentration of pollutants at routine water quality monitoring locations	Environment Agency and Project Surface water quality baseline report	September 2017	Y
	Land quality	Land parcels in the catchment and their uses e.g. agricultural, urban etc	Environment Agency, EIA land quality team		N
	New water quality monitoring data – mg/l	Spot sampling data at multiple sites identified for the Project will become available at a later stage in the project	Project field monitoring		N

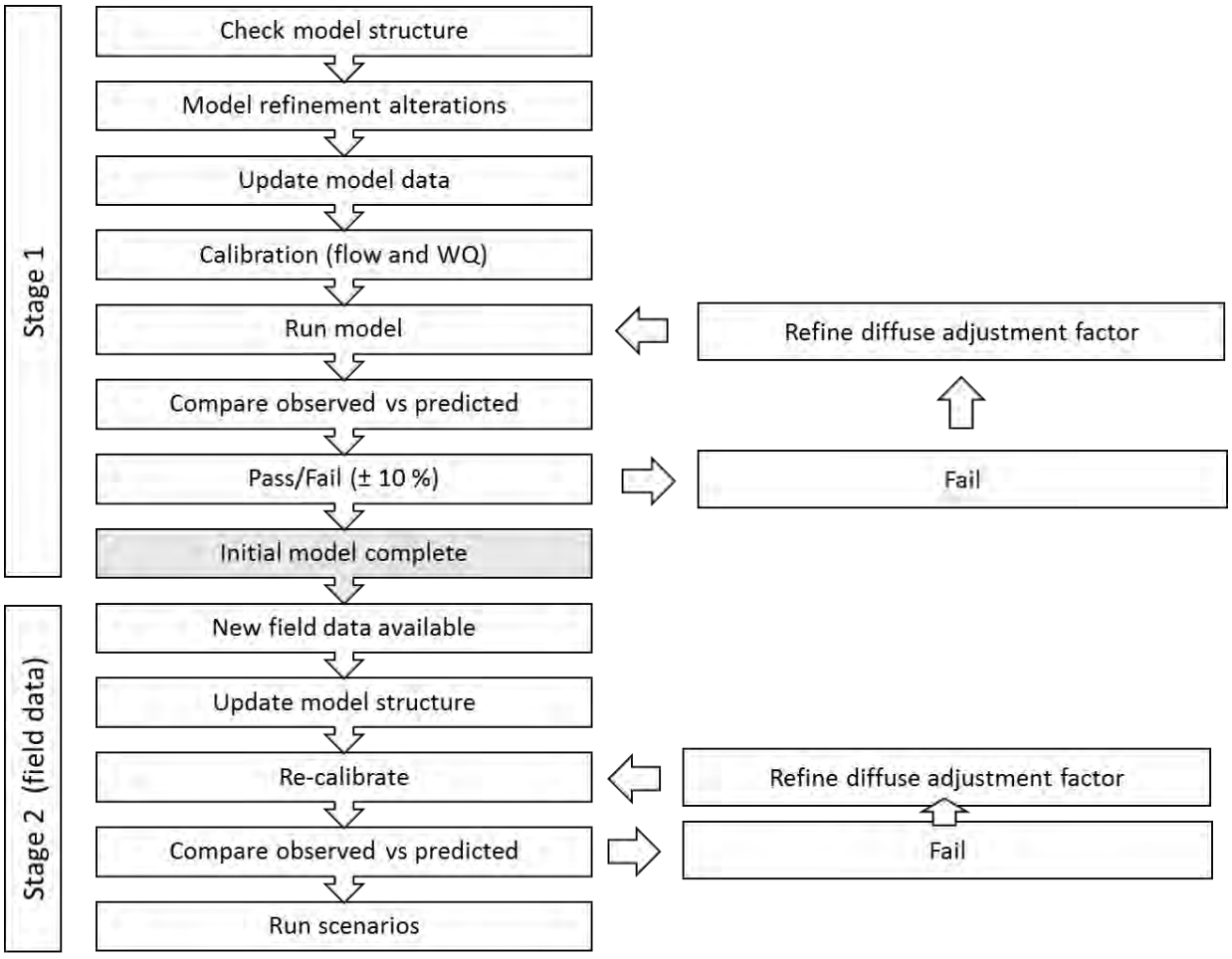
Table 18.3.2 Data sources and description

3.2. Data sources and availability

3.2.1. Numerous data sources will be required for water quality model development and testing, to ensure accuracy in representation of the features. These are listed in Table 18.3.2, along with the model component where they are applicable and where the data is anticipated to be sourced from. It is anticipated that each of those listed will become available as the Project progresses. However, if this is not the case then an alternative source will need to be sought or default assumptions will be used where possible. This would be done in line with the other EIA disciplines and in consultation with the Environment Agency. Alternate sources could include older Environment Agency data (e.g. from 2000-2010), assumptions on based on peer reviewed literature for the rivers or using the Environment Agency's original Simcat model as the default baseline (adjusting to account for any known upstream improvements).

3.3. Decision overview flow chart

3.3.1. Graphic 18.3.1 gives an overview of the water quality modelling process, including any necessary updates to the model and the steps that will be taken to ensure accurate representation of the water bodies of interest. Critically, the model update will take place in two stages, initially using current available data and then again following the collation and review of additional field data once collected.



Graphic 18.3.1 Stages to be used for the River Catchment water quality modelling

3.4. Pre-calibration checks

Model refinement

3.4.1. During their initial development, Simcat models covering multiple regions across England and Wales were based largely on national datasets available through the Environment Agency. Therefore, when using Simcat at a local waterbody scale it is essential to check model inputs and outputs against additional recent data collected within the assessment area to ensure that the model performance is acceptable.

3.4.2. As identified in Section 3.2, the water quality model refinement will take place in two stages in this project, as dictated by the availability of data. The initial stage will use currently available data[2] (from public and private sectors) to update the model structure and features where necessary, alongside the calibration of observed against predicted estimates of flow and river quality. Following this, a second stage of model refinement will be necessary when new monitoring data from the 2017/2018 Project field surveys will be available to improve the representation of the catchment. The model may need to be calibrated again following the addition of the new monitoring data.

3.4.3. The refined model will be used to support the assessments for the Environment Statement for the Project. The initial model will be used to support the PEIR.

Model structure

3.4.4. As a first step, the model features and their spatial location within the assessment areas will be checked. This includes the location and interaction of features such as tributaries, abstractions, sewage treatment works, industrial discharges, water quality and flow monitoring stations and known intermittent discharges within the catchments. Other pre-calibration model checks may include, for example:

1. Review relevant default values in the model where no real data was available (discharge quality, head water flows);
2. Review and update headwater areas/flows;
3. Update decay rate of substances (where applicable);
4. Update time-of-travel of substances; and
5. Set up the model files to represent relationship between diffuse inputs and river flow.

3.4.5. If the model structure is found to be correct the calibration will proceed to the next step. If incorrect (e.g. incorrect connection between tributaries, missing, known discharge features or abstractions) the model will be updated based on available data from the Environment Agency, National River Flow Archive or defaults (e.g. values already included within the Simcat model) where necessary. Any available and relevant data from surveys (e.g. land quality and groundwater investigations) undertaken for the Project will also be used. Any changes made will be recorded in the model databases including date, description and who undertook the work. A

[2] As set out in the surface water quality, groundwater and land quality baseline reports

model log will also be set up to record details of each model run and the criteria used, so changes can be tracked throughout the lifetime of the project.

3.4.6. Figure 18.3.2 demonstrates the connectivity of the reaches in the model and their relationship to WFD water bodies. The example model shown is a simplification of all the various water bodies and interlinkages surrounding the Project but represents the dynamics of the environment accurately to enable simulation of different construction scenarios and their impact on water quality objectives.

3.5. Calibrating SAGIS/Simcat

Flow calibration

3.5.1. Following model structure checking, the next stage evaluates model performance to ensure flows are represented accurately. This includes flows from sewage treatment works and the surface waters/rivers within the model area. For this task, flow data from sewage treatment works within the catchment will be obtained from relevant stakeholders such as the Environment Agency and Thames Water for the same period used for producing the water quality baseline report (i.e. 2014-2016[3]). This will be checked against the data already contained within the model databases and against more recent data, if available, to ensure that the data remain representative. If the mean flow (Ml/d) data of point sources contained within the model database is different from that provided by the Environment Agency or Thames Water, the model will be updated with the data collated within the baseline report for the Project.

3.5.2. In addition to the flow data for the sewage works, data from river flow gauging stations will be used to check flows within the Simcat model and update them where necessary. Where no new data is available from the gauging stations, the river flows included in the model database will be used as the default. Observed river flow data has been sought for eight sites. A further four potential sites have been identified which could be included for later refinement of the model upon collation of 2018 survey data if required, i.e. if there is uncertainty as to the model calibration (Table 18.3.3)

River	Assessment area	Gauging station name	NGR	Station ID	Comments
Pinn	Colne	Pinn at Uxbridge	TQ062826	39098	
Colne	Colne	Colne at Denham	TQ051863	39010	
Crane	Crane	Crane at Cranford Park	TQ103778	39057	
	Crane	Crane at Marsh farm	TQ154734	39094	
Thames	Thames	Thames at Staines	TQ034713	39111	
	Thames	Thames at Walton	TQ099670	39121	
Wraysbury River	Colne	Wraysbury river	TQ033717		Flow gauges in model but not on NRFA website
Colne Brook	Colne	Colne brook Hythe	TQ019723		Flow gauges in model but not on NRFA website
Horton Brook	Colne	NONE			

[3] At the time of producing the report and setting up the model the 2014-2016 period was deemed to be the most up to date and comprehensive dataset available.

Frogs Ditch	Crane	NONE			No gauging station noted in the SAGIS model
Portlane Brook	Thames	NONE			
	Thames	NONE			

Table 18.3.3 River flow gauge sites from the Simcat model to be updated

3.5.3. After updating the flows, the Simcat model will be run and observed mean and Q95 flows at each of the gauging stations will be compared to the modelled mean and Q95 flows and the ratios between them will be calculated. If the modelled flows are within ±10% of the observed flows then the model will be considered acceptable. Alternatively, if the modelled flows are not within ±10% of the observed then the ratios calculated between the observed and the modelled flows will be used to update the mean and Q95 flows of the waterbody within the Simcat model. For any water bodies without observed flow data the median of the ratios for other water bodies will be used.

3.5.4. Subsequent to the completion of all flow updates, the Simcat model will be run again and the observed mean and Q95 flows at the gauging stations will be compared to the modelled flows to ensure accurate representation. Accurate flow representation is crucial as it forms the basis of the dilution applied to pollutant concentrations in-river.

3.5.5. Additional data will become available following the completion of new river flow gauging and an accretion study looking at the interaction between groundwater and surface water in the Colne catchment. This new data will be reviewed in conjunction with the modelled flows and any major discrepancies investigated to ensure that the model remains robust and that any differences between observed and modelled flows are understood.

Water Quality calibration

3.5.6. Water quality calibration applies to the accurate representation of the amount of each determinand predicted in surface waters using the Simcat model and has to be undertaken on a substance by substance basis. The example below describes the process undertaken for phosphate (used as a proxy for the steps to be taken for all determinands). The rationale behind the calibration steps is based on the assumption that the steps undertaken before the water quality calibration (i.e. refining model structure and flow) will optimise the representation of point source inputs so that any remaining error in model predictions is attributable to diffuse or intermittent inputs (that are then adjusted as part of the calibration process).

3.5.7. The first stage involves checking that the phosphate concentration data in the model for discharges (e.g. sewage treatment works) within the catchment are accurate. Data on phosphate concentrations in effluent discharges will be obtained from Thames Water and updated in the Simcat model, which includes a mean and standard deviation for each discharge feature.

3.5.8. After completing the update of discharge quality data, the Simcat model will be run and, as before, the modelled phosphate concentrations will be compared to observed phosphate concentrations at river water quality monitoring locations

where data is available from the Environment Agency (or monitoring from the Project at a later stage). For best comparison, water quality monitoring sites will be chosen at the lower end of the WFD water bodies within the model. If the model is evidently under or over predicting by more than 10%, the major diffuse inputs within the catchment will be altered iteratively based on the ratio of the observed to modelled phosphate concentration at the water quality monitoring locations. (Additionally any point source inputs which did not have new data entered will also be reviewed). Diffuse and/or intermittent (CSO) input sectors will be adjusted based on monitoring data collected (on the assumption that point sources discharges are well represented in Simcat) until the model is predicting phosphate concentrations which are close to the observed monitoring data (see section 3.5). This approach is the same as that commonly used by the Environment Agency and will be followed for all determinands used in the modelling exercise.

3.5.9. Additional determinands will be added to the database and calibrated based on monitoring data collected during the 2017/2018 monitoring programme at a later stage[4]. Determinands included in the model will be prioritised depending on the number of exceedances of EQSs at monitoring sites across the catchment and the likely determinands which could be impacted by construction or operational phases of the Project. Similarly, additional land quality data will become available at a later stage in the modelling project which will also be integrated into the catchment model. Diffuse runoff from different land quality parcels in the catchment may affect the concentrations of some chemicals in surrounding water bodies, so following the addition of this data the model may require recalibration. This will be assessed at a later stage once sufficient new monitoring data becomes available (e.g. six months).

Calibration statistics and evaluation method

3.5.10. To ensure calibration alterations improve the accuracy of quantification of pollutant loads in surface waters, a single test method will be used to assess the outcomes of calibration adjustments. The method of scoring calibration improvements will be based on the percentage agreement of pre (baseline) and post calibrated data to quantify the magnitude of difference between predicted and observed concentration estimates. Ideally, all of the water quality concentration data predicted by the model should be within 10% of the observed water quality data to ensure an accurate representation of reality when modelling different scenarios. This will provide a statistical value with which the agreement between the observed and predicted concentrations of each chemical can be quantified, and allow scoring/ranking of the outcome of each calibration change. The calibration that achieves the best percentage agreement between observed and predicted load/concentration will be taken forward for use in the scenario modelling. This will be decided using the matches between annual averages (observed) and model output concentrations at all sample points. Any differences between observed and model outputs that cannot be corrected will be noted and used in interpreting the model results of future scenarios.

3.5.11. As previously mentioned, additional monitoring data will become available during the Project and will be integrated into the model. This will likely result in repeated

[4] If enough data is available this will be undertaken for the PEIR

calibration checks (a two-stage calibration) to ensure any new data does not alter the agreement between observed and predicted in-river concentrations or flow dynamics within the catchment.

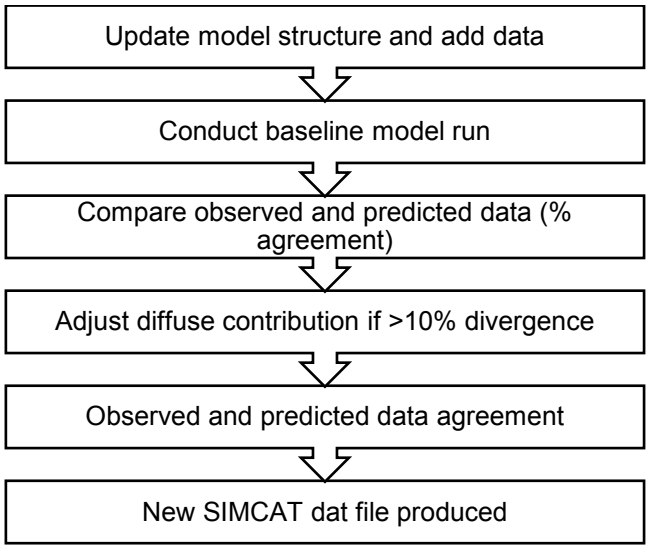
3.5.12. Additionally if a determinand or site has a divergence of greater than 10% between the modelled and observed data that cannot be resolved (e.g. calibration using reasonable adjustments still leads to a difference of greater than 10%) agreement will be sought from the Environment Agency on how the model output should be interpreted.

3.6. Refining the calibration

3.6.1. Upon completion of any relevant surveys being undertaken for the Project in 2018, the Simcat model will be updated with the new data and the steps noted in sections 3.1 through 3.5 will be run through again to check if any changes to the model are required.

3.6.2. This refinement is expected to also include additional data such as river flow gauging and an accretion study looking at the interaction between groundwater and surface water in the Colne catchment (as the main area where land use change and alterations to river channels are expected). The accretion data (the gradual increase or decrease in flow of a stream attributable to runoff, seepage, or ground water discharge) will be added to the model in the water bodies where field data is available. Following the addition of this data, the model will need to be recalibrated to ensure that the observed and modelled flows still agree within a margin of 10%.

3.6.3. No accretion or detailed groundwater surveys are planned for the Crane or Thames catchments as no significant land use changes are planned to the same scale as will be the case in the Colne. As such, for the catchment modelling the calibration will rely on the EA's calibration augmented with the basic checks noted in this section.



Graphic 18.3.1 Steps to be undertaken for the calibration statistics and evaluation method

3.7. Modelling different scenarios

Updating the river structure within the model

3.7.1. As a result of the construction of new infrastructure for the Project and changes to the water environment (e.g. the covered river corridor and changes to river channels) we anticipate changes in the structure of the river connections within the water quality model will be necessary. The modelling of the different scenarios will be based on the refined calibration that will be completed after 2018 surveys are finished.

3.7.2. The scenario modelling will aim to assess the different construction/expansion scenarios for the Project, and will encompass any changes to the surrounding landscape, water bodies, discharge features, diffuse inputs and abstractions in the catchment. This will be undertaken for the following features using the process detailed below:

1. Physical changes to waterbody length or diversion of watercourse (including bifurcations if required)

    a) Modifications to watercourse length can be made in the relevant section of the model '.dat' file, depending on whether watercourses will be shortened or lengthened in each scenario. These changes may also have implications for the connectivity of reaches, in which case the next downstream reach number will need to be updated in the '.dat' file to ensure the river sequence matches.

    b) Similarly, diversion of watercourses requires an adjustment in the '.dat' file to be made that alters the reach length and connectivity to the next downstream reach. If a bifurcation is necessary as the result of a watercourse diversion this feature will be added to the '.dat' file and the proportion of flow attributable to each downstream reach will be included as well as reach information.

2. Additional discharges or changes to existing discharges

    a) If, during the modelling and development of scenarios additional point source discharges (trade/ industry/municipal) are identified or new discharges are planned, these will be added using the following: location, point of discharge to the river, discharge flow and water quality information. Intermittent discharge features are more complex, given that the information available on flow, quality and their impact on water bodies is uncertain, and it is likely to be more appropriate to use RQP in these cases to assess transient effects on water quality.

3. Additional abstractions

    a) The current water quality model already has an extensive number of licensed abstractions in the local area. These are predominantly used for spray/ non-spray irrigation which is assumed to only occur for half of the year (during the warmer months).

    b) Where additional or newly located abstractions may occur as a result of the Project or future plans, these will be added as features to the '.dat' file.

Accompanying information on the source water body and the abstracted flow will be added alongside the location.

4. Culverting or covering of existing watercourses

    a) Proposed culverted watercourses or covered river corridors will be represented in the model as an abstraction and discharge point at the most upstream and downstream point of the culvert respectively. It is likely that detailed design information for proposed culverts will not be available at this stage, in which case a "worst case" scenario will be assumed, that the length of watercourse will have no interaction with groundwater.

5. Land use changes

    a) The Project will ultimately lead to alterations in the use and surface water runoff. These changes will be reflected in the model by modifying the diffuse runoff quantity and quality from different land use types (for example agricultural/livestock, agricultural/arable, highway runoff, urban runoff).

6. Construction and operational time periods

    a) During construction phases we will make a reasonable prediction as to what the land surface will be at that specific stage in the programme. Construction and development of land in proximity to any watercourse will increase the risk of diffuse runoff of both pollutants and sediment into the catchment. Additionally, it is unknown whether during this period any buffer strips will be in place to limit runoff into surface waters. Therefore during construction phases of the Project changes will be made to the amount of diffuse runoff and the chemical quality, which will be higher in suspended sediment and nutrients (N and P) based on construction plans and best practice techniques for the stretches of river that will be affected.

Scenario modelling

3.7.3. For each scenario, it is assumed that several model runs will be necessary. These could include:

1. A baseline run, showing the current situation
2. During runway construction (one run showing effects of temporary works although multiple runs may also be required: this will be reviewed as the assessment progresses).
3. Following completion of the Project construction (one run of the final masterplan for the Project), i.e. during full operation. This will also produce data which will feed into the reservoir and lake modelling (Section 4).

3.7.4. Covering all three scenarios will allow comparisons to be drawn across the lifecycle of the Project.

3.8. Presenting modelling results

Spatial mapping

3.8.1. Outputs of the water quality modelling, including the results of different scenarios, will be presented in a series of georeferenced layers displayed in GIS. This will allow spatial representation of changes to water quality across the catchments in relation to the Project and additional habitat/ecological drivers.

Graphical outputs

3.8.2. To demonstrate the results of all modelling scenarios, figures and graphs will be produced to evaluate the effects of the Project. We anticipate that this will include the following:

1. River Profile – flow and load of specific pollutants along the channel of the key rivers;
2. EQS pass/failures;
3. River length compliant; and
4. Habitat quality/score/loss of habitat.

3.8.3. The number and water quality locations that are the focus of the graphs will be tailored to those EQS exceedances and at risk stretches of water bodies in the model. Similarly, it is anticipated that water bodies in closest proximity to the most significant physical or land use changes will be the focus of the graphical reporting.

4. Reservoir and lake modelling

4.1. Overview

4.1.1. The purpose of this methodology section is to describe the proposed approach to simulating nutrient concentrations in still waters (lakes and reservoirs) that could potentially be impacted by the Project. Nutrients were selected as the determinands of concern based on the designation and compliance requirements of the Southwest London waterbodies SPA.

4.1.2. Current legislation (e.g. the Water Framework Directive, 2000/60/EC) sets out environmental quality standards in terms of pollutant concentrations. However, it is not straightforward directly to estimate changes in nutrient concentrations in still waters resulting from changes in concentrations in inflows. The proposed methodology is therefore based around the estimation of nutrient loads (i.e. kg/year) entering and leaving the waterbodies, from which resulting nutrient concentrations can then be estimated.

4.1.3. The methodology comprises two distinct elements:

1. A simple approach to estimating nutrient budgets for still waters; and, if required;
2. More detailed modelling of nutrient cycling and retention in the still waters.

4.1.4. No consideration is given in this methodology to assessment of the effects of changes in nutrient concentrations on the ecology of the still waters. Instead this methodology will provide the evidence to support later ecological assessments.

4.2. Still waters included in the proposed assessment

Still waters Heathrow Expansion Project

4.2.1. Six still waters, comprising five reservoirs and one lake, have been identified based on presence in the water quality assessment area and potential for them to be impacted by the Project (see Table 18.3.4 Surface areas of reservoirs included in the proposed assessment

4.2.2. The five reservoirs supply drinking water to London and are fed by abstraction from the River Thames. The lake, Wraysbury No. 2, is a disused gravel pit which has been allowed to flood with groundwater.

4.2.3. WFD Reservoir and lake surface areas are provided in Table 18.3.4[5]. Some of the still waters also have amenity value (e.g. birdwatching; sailing on Queen Mother Reservoir, angling at Wraysbury No. 2), and four have nature conservation designations (i.e. Special Protection Area (SPA), Ramsar site and Site of Special Scientific Interest (SSSI), see Table 18.3.5).

4.2.4. It may be necessary to include other lakes or reservoirs that might later be found to require assessment. These assessments will be specific to each lake depending on the impact the Project will have and the needs of other parallel workstreams such as Biodiversity.

[5] Still waters that are not designated under the WFD or part of the southwest London SPA are not included in the modelling but will be assessed separately as part of the EIA.

Reservoir / Lake (WFD waterbody ID)	Surface area (km2)
The Queen Mother Reservoir (GB30642334)	1.91
Wraysbury Reservoir (GB30642417)	1.83
Wraysbury No 2 (GB30642489)	0.53
King George VI Reservoir (GB30642488)	1.38
Staines Reservoir North (GB30642490)	0.7
Staines Reservoir South (GB30642525)	1

Table 18.3.4 Surface areas of reservoirs included in the proposed assessment

Reservoir / Lake	**Designation**
Wraysbury Reservoir (GB30642417)	Ramsar Site (Conservation of Wild Birds Directive)
Wraysbury No 2 (GB30642489)	SSSI (waterbird populations)
King George VI Reservoir (GB30642488)	SPA (South West London waterbodies)
Staines Reservoir North and South	Ramsar Site (Conservation of Wild Birds Directive)

Table 18.3.5 Reservoir designations

4.3. Proposed Methodology

4.3.1. The proposed approach to estimating nutrient budgets comprises the following steps:

1. Development of a conceptual model of each; and
2. Constructing a nutrient budget for each.

Conceptual models

4.3.2. In order to characterise the principal sources and pathways of nutrients to each reservoir, we propose to develop a conceptual model of each. There are a number of potential sources and pathways for nutrients to reservoirs, although it is likely that only some of them will be applicable in each case.

4.3.3. Potential pathways to the reservoirs and lakes include:

1. Surface runoff from the wider topographic catchment to the reservoir. This will not apply to embanked reservoirs, for which the catchment will extend only to the top of the bank and will thus include only a very small area;
2. Via groundwater, for reservoirs and lakes which are groundwater fed or hydraulically connected to groundwater;
3. Atmospheric deposition; and
4. Direct inputs, for example from birds or via fish populations, or in water pumped into the reservoir for storage (the latter will be informed by the River Catchment modelling undertaken with Simcat; see Section 3).

4.3.4. A conceptual model will be developed of each reservoir that identifies all applicable pathways for nutrients to the reservoir. This will include working with the groundwater modelling team to ensure that the conceptual models of the reservoirs are consistent with their understanding, and information from the ecology team on fish and bird populations will inform the assessment of potential inputs from birds and fish. All applicable sources of nutrients that could reach the reservoir/lake via those pathways will then be identified.

Nutrient budgets

Basic estimate

4.3.5. A simple nutrient budget for each of the still waters will be constructed. This will entail the estimation of nutrient loads (kg/year) entering the reservoir from each of the principal sources. Nutrient loads in each inflow will be estimated from flow and nutrient concentration data.

4.3.6. The total nutrient load removed from the still waters in kg/year will also be calculated (e.g. water taken from the reservoirs and treated for drinking water). In theory, and in the absence of any losses from the system (i.e. retention), the nutrient concentration in each waterbody is simply the flow-weighted average of the nutrient concentrations in the inflows.

4.3.7. It is recognised that reservoir water quality and nutrient loads will vary seasonally, and for that reason it is proposed to estimate annual nutrient budgets.

4.3.8. The proposed calculation methods by which each of the input and output terms will be estimated are shown in Table 18.3.6, although the precise methods adopted will depend on the available data. Ideally, calculations will be carried out for 3 years to allow for some inter-annual variability in nutrient budgets. Depending on data availability, calculations will determine the loads of:

1. Total Inorganic Nitrogen (nitrate, ammonium, nitrite), or if data are not available, nitrate; and
2. Total phosphorus, or, if data are not available, orthophosphate.

Nutrient loading term	**Calculation method**
Input in water from R Thames	Nutrient input estimated from river water quality data and abstraction volumes. Ideally, calculations will use weekly or more frequent data to capture variations in source water quality.
Catchment runoff	Nutrient inputs where there is a direct pathway from the catchment into the waterbody (i.e. the waterbody is not embanked). This is likely to require the use of model outputs, and use of SA-GIS output is proposed.
Atmospheric deposition	Estimated from literature values, or if available, from detailed modelling supplied by the Projects Air Quality team.
Inputs from fish and waterbirds	Estimated from bird breed/feeding habit, fish and bird population numbers and literature values for nutrient inputs by birds and fish.
Offtake in abstracted water	Nutrients removed estimated from reservoir water quality and abstraction volumes. Ideally, calculations will use weekly or more frequent data to capture variations in source water quality.

Table 18.3.6 Nutrient budget calculation methods

4.3.9. Theoretically the difference between the total load input and the total load removed will give an indication of nutrient retention in the still waters. In practice, some of the inputs will be uncertain, and so there will also be some uncertainty in the estimates of retention. Since retention acts to reduce nutrient concentrations in still waters, if the uncertainty in estimates of retention is prohibitively large, it will be conservative to assume no retention and that changes in nutrient loads entering the lakes and reservoirs will cause proportional changes in concentrations (i.e. an increase in loading of 1% compared with the baseline will cause an increase in concentration of 1%). It will also be possible to gauge whether any retention is occurring by direct comparison of the water quality in the Thames at the point of abstraction (if the water at the abstraction point is monitored) and the reservoir water quality. If there is a significant difference in nutrient concentrations between the two (i.e. nutrient concentrations in the reservoir are lower than those in the river) this would indicate that some retention is occurring in the reservoir.

Simulation of nutrient retention

4.3.10. Depending on the depth of each reservoir or lake, volume of water held and flushing rate, it is possible that some nutrient retention may be occurring. In this context, nutrient retention refers to removal of phosphorus or nitrogen from the water column through sedimentation or uptake by aquatic organisms, and removal of nitrogen from the water column by denitrification.

4.3.11. A number of equations to estimate nitrogen and phosphorus retention in lakes and reservoirs are presented in the literature. Published equations will be used to estimate the degree of nutrient retention in the still waters. Examples of some possible approaches are presented below but the approach adopted will depend on the data available.

Nitrogen retention

4.3.12. Tomaszek and Koszelnik (2003) developed an empirical model of nitrogen retention in reservoirs, based on data from seven reservoirs in southern Poland. They found that nitrogen retention was principally a function of hydraulic retention time (HRT) and the nitrogen loading in the reservoir, and could be expressed in the form:

$$N_{ret} = \frac{1}{(1+HRT)^a} {N_{retmax}}^a,$$

where

$$N_{retmax} = {\left(N_{load} + N_{pool}\right)}/{n}.$$

4.3.13. Nload is the monthly N loading to the reservoir (g/m2), Npool is the nitrogen mass in the reservoir at the beginning of the month (g/m2), HRT is the hydraulic retention time (monthly) and n the number of days in the month. The coefficient a has a value a=0.957 ± 0.072.

4.3.14. Saunders and Kalff (2001) studied nitrogen retention in rivers, lakes and wetlands, and found that differences in the proportion of retained N could be

explained almost entirely by differences in discharge rate. They presented regression relationships between nitrogen retention and loading and found that, of the various mechanisms of retention, denitrification was the most significant.

4.3.15. For lakes, they found a regression relationship of the form:

$$y = 2.53 + 0.34x,$$

in which *y* is N retention (g/m^2/yr) and *x* is N loading (g/m^2/yr) (r^2=0.80).

Phosphorus retention

4.3.16. One of the most widely adopted models of phosphorus retention in lakes is that developed by Vollenweider (1968, 1975). This assumes that the loss of phosphorus to sedimentation is proportional to the phosphorus concentration in the lake, and can be expressed as:

$$PV = \frac{M/V}{(Q/V)+\sigma},$$

4.3.17. In which P is lake phosphorus concentration (g/m3), V = lake volume (m3), M = annual mass loading of phosphorus input to the lake (g/yr), Q = annual outflow from the lake (m3/yr) and σ a sedimentation coefficient (y-1).

4.3.18. This last parameter, σ, is often poorly constrained and difficult to measure. Based on an analysis of data from 21 European and North American lakes, Vollenweider (1976) estimated values of σ to be equal to approximately (10 / mean depth of lake).

4.3.19. Kirchner and Dillon (1975) proposed a modified model:

$$P = \frac{M(1-R_p)}{Q},$$

where R_p is the proportion of phosphorus lost to sedimentation, and is calculated as:

$$R_p = v/(v + q_s).$$

4.3.20. Here, v is the apparent settling velocity and qs the areal hydraulic load. This avoids the need to know the depth of the lake. Dillon et al (1994) suggested values of v of 12.4 or 7.2, for lakes with an oxic or anoxic hypolimnion, respectively.

4.4. Summary of data requirement

4.4.1. The data requirement to carry out nutrient budget calculations and retention calculations is summarised in Table 18.3.7. Historical monitoring data will be sought from Thames Water or the Environment Agency for the periods required.

Nutrient loading term	Calculation method
Water quality data (R Thames at point of abstraction)	Total Inorganic Nitrogen or nitrate concentrations, and Total Phosphorus or orthophosphate concentrations. Preferably for a period of 3-4 years.
Water quality data (reservoir)	Total Inorganic Nitrogen or nitrate concentrations, and Total Phosphorus or orthophosphate concentrations. Preferably for a period of 3-4 years.

Nutrient loading term	Calculation method
Abstraction volume from R Thames	Ideally at a temporal resolution that matches the water quality data, or better, for the same 3-4 year period.
Offtake volume from reservoir	Ideally at a temporal resolution that matches the water quality data, or better, for the same 3-4 year period.
Reservoir depth and volume	Typical or mean values of water depth and total water volume held.
Reservoir surface area	Typical or mean value.
Atmospheric deposition	Estimated baseline rates of deposition of nitrogen and phosphorus.
Bird numbers by species	Estimated waterfowl populations. Period of residence on reservoir if they are migratory.
Fish numbers by species	Estimated fish populations.

Table 18.3.7 Data requirement for nutrient budget and retention calculations

4.5. Conclusion for lakes modelling

4.5.1. This note sets out a proposed methodology for the estimation of baseline nutrient concentrations in still waters in the assessment area. The method will provide estimates of nutrient loadings from applicable sources and resulting nutrient concentrations in the waterbodies. These outputs will enable later estimation of the potential changes in nutrient concentrations resulting from the Project, and their assessment for significance, and hence inform any required mitigation strategies.

4.6. References

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Kirchner, W.B. and P.J. Dillon. (1975). An empirical model for estimating retention of phosphorus in lakes. Water Resour. Res. 2:182-183.

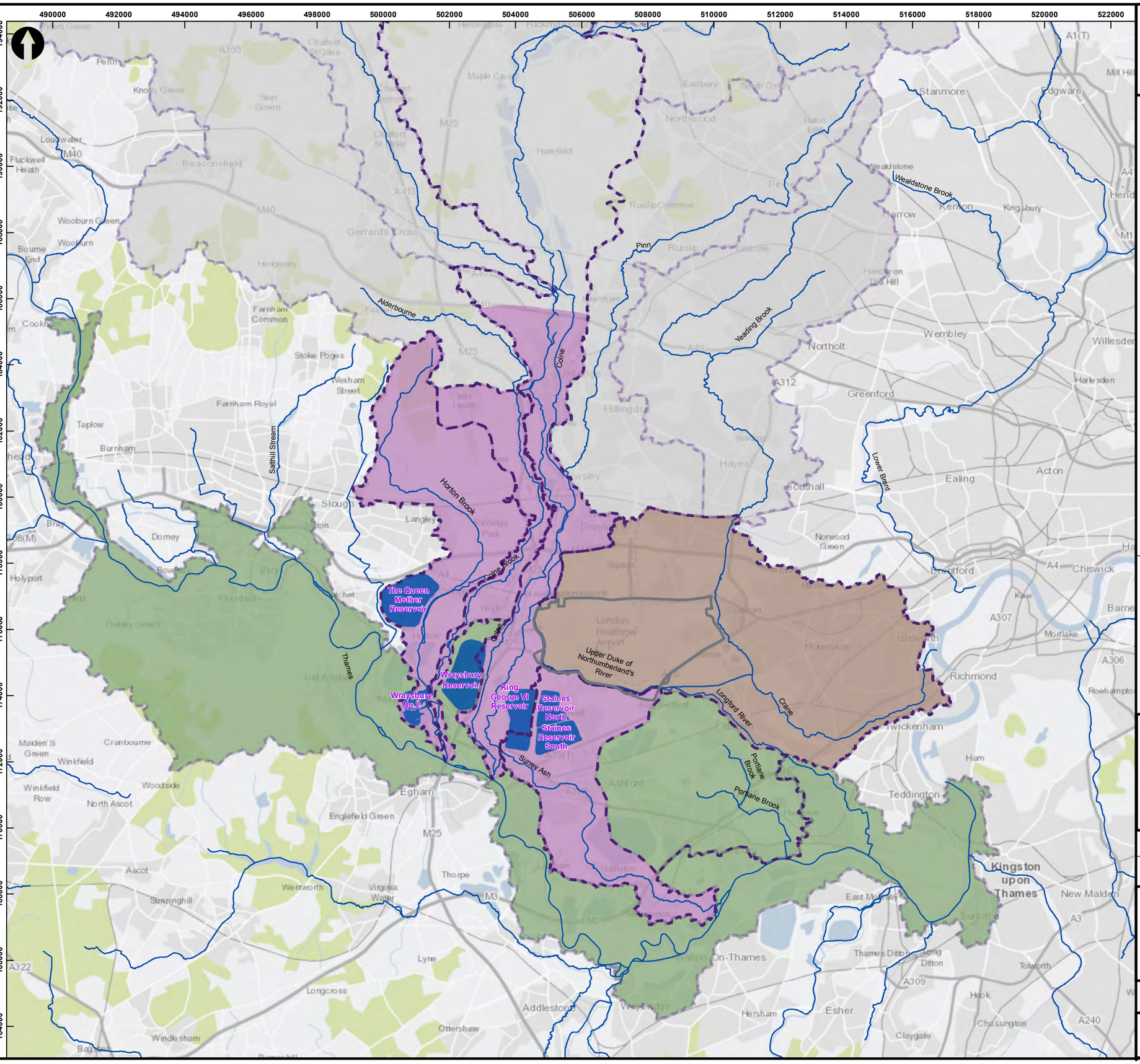
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Vollenweider, R.A. (1968). The scientific basis of lake and stream eutrophication, with particular reference to phosphorus and nitrogen as eutrophication factors. OECD Tech. Report DAS/CSI/68.21. Paris.

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- Heathrow Planning Boundary
- Local surface water study area
- Wider surface water study area
- River Colne surface water study area
- River Crane surface water study area
- River Thames surface water study area
- WFD Lakes
- WFD Rivers

Scale 1:115,000

Heathrow

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Scale	Project Name	Heathrow Project No.
1:115,000	Heathrow Expansion Project	HEP53

Title

Figure 18.3.1: Draft Assessment Area

Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	EASTR	DAVISP	10/05/2018	FINAL

Location-Level-Sub Series/System-Identifier	Version
HEP53-XX-GA-XXX-000161	1.0

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Appendix 18.4
Flood Risk Assessment
Method Statement

This report has already been issued to some stakeholders for their consideration. As such, the report, the description of the development and some of the terminology used reflects the point in time that the report was produced and may differ from that presented in Volume 1 of this Scoping Report

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Heathrow Expansion Project: Flood Risk Assessment

Method Statement

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0.1	14-09-2017	Issued to EA for comment
0.2	18-12-2017	Updated to include design standards and climate change allowances table
0.3	22-03-2018	HAL Review
0.4	03-04-2018	Update post HAL review
0.5	17-04-2018	Update post Legal Review

Stakeholders

Name	Role
	Stakeholders are the nominated persons the document is to be issued to
HAL	Heathrow as client

Approved: Name: Name

Role: Task Order Manager

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1. Introduction

1.1. Background

1.1.1. Heathrow is proposing to develop a third runway at the existing Heathrow airport. The Heathrow Expansion Project (the Project) will include associated on and offsite facilities and infrastructure, as well as transport infrastructure changes that include modification of the M25 between junctions 14, 14a and 15 and replacing and re-routing local roads such as the A4 and A3044.

1.1.2. The original purpose of this document was to brief the Environment Agency (EA) and Lead Local Flood Authorities (LLFAs) on the development of the Flood Risk Assessment (FRA) baseline for the Project in order for the EA to provide comment on the proposed scope and approach. Following consultation with those parties, the document is now included as an appendix to the Scoping Report in order to provide supporting information to Chapter 18: Water Environment regarding the proposed approach to the FRA. The Project is classed as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act, 2008 (the Act) and is subject to an application for a Development Consent Order (DCO) to the Planning Inspectorate (PINS) under the Act.

1.1.3. An Environmental Statement (ES) is a statutory component of a DCO application and the Flood Risk Assessment (FRA) will comprise an appendix to the ES, extracts from which will be reported in the ES. The ES is preceded by the Scoping Report, of which this document comprises an appendix, and a Preliminary Environmental Information Report (PEIR).

1.1.4. The Scoping Report, PEIR and ES will be subject to public consultation with statutory and non-statutory stakeholders. The key statutory consultees in relation to the FRA include the Environment Agency, in its capacity as principal regulator, and the relevant Lead Local Flood Authorities (LLFAs).

1.1.5. As part of the initial stages of FRA and ES preparation, it is important to robustly establish the flood risk baseline in order to ensure that all consultees are appraised with the pertinent risks and to ensure that absolute transparency between developer and consultees is established (to be maintained throughout the consultation process leading up to the submission of the DCO application).

1.1.6. This is a live document and will be updated throughout the Project reflecting ongoing engagement with stakeholders.

1.2. Document Outline

1.2.1. The remainder of this document provides relevant background information on:

- The proposed scheme
- Relevant policy and guidance
- Climate change allowances

- Design standards
- FRA definitions,
- Baseline definitions, and
- Baseline data sources.

2. Project Overview

2.1.1. An overview of the Project can be found in Chapter 3 of the Scoping Report.

2.2. Project Elements That Interact With Flood Risk

2.2.1. From a flood risk perspective, the main project elements of interest are:

- The western areas of the project area located in mapped areas of fluvial flood risk (in accordance with Environment Agency flood mapping).
- The proposed diversion of several main river watercourses located to the northwest and west of the existing Heathrow complex.
- Interaction with Ordinary Watercourses (as yet undefined);
- Loss of floodplain storage and the need to provide compensatory flood storage zones;
- Enhanced flow conveyance through the diversion structures due to proposed net shortening and straightening of existing channel flow paths;
- The management of surface water runoff from the new runaway and associated infrastructure.

2.3. Watercourse diversions

2.3.1. The current proposals are to divert all watercourses adjacent to the new runway for the diverted watercourses to run under the new runway and to then re-emerge to the south of the new runway, approximately opposite the existing Terminal 5 building.

2.3.2. The changes to the channel configuration and the development will result in the loss of floodplain storage zones to the west and northwest of the existing Heathrow complex. As such, proposals are being developed that will provide compensatory storage.

2.3.3. Furthermore, the net length of watercourse is likely to be shorter than at present and thus there is the potential to convey a greater volume of water at a higher velocity through the diversion structures, however, the potential impacts to downstream receptors are expected to be mitigated in the design of the structures.

2.4. Project Timeline

2.4.1. An outline of the anticipated construction timeline is provided in Chapter 3 of the Scoping Report. The indicative period for construction of the new runways and other component required to enable the runway to operate is 2021 to 2026. Construction of the terminals and other associated infrastructure is expected to continue until approximately 2035.

2.4.2. It is necessary to provide a nominal lifetime for the development for planning purposes. Since current climate change projections are provided in ranges, the most far out being the '2080s' (assumed to include the period covering 2070 to 2115) it will be assumed for the purposes of this assessment only that the development lifetime ends within that period, however, the design timeline will be refined at a later date.

3. Planning Context, Guidance and Requirements

3.1. National Policy Statements

3.1.1. The Project falls under Section 23 of the Planning Act 2008 (the Act) as a Nationally Significant Infrastructure Project (NSIP). Under Section 31 of the Act, development consent is required to the extent that it is, or forms part of, an NSIP. Development consent is granted by the making of a Development Consent Order (DCO) for which an application may be made to the Planning Inspectorate (PINS) under Section 37 of the Act.

3.1.2. The consultation period for the Heathrow Expansion: draft Airports National Policy Statement (NPS) [Ref 1] closed on May 25, 2017 and , once designated by the Secretary of State, this NPS will set out policy for the Project and will materially affect the decisions taken by the Secretary of State for Transport on the Project DCO application. A revised draft ANPS was published in October 2017.

3.1.3. The key requirements of a FRA as set out in the revised draft NPS are that it should:

- Consider the risk to third parties of all forms of flooding arising from the development as set out in the preferred scheme, in addition to the risk of flooding to the development itself, and demonstrate how these risks will be managed and, where relevant, mitigated, so that the development remains safe throughout its lifetime;
- Take into account the impacts of climate change, clearly stating the development lifetime over which the assessment has been made;
- Consider the need for safe access and exit arrangements at all stages of the development;

- Include the assessment of residual risk after risk reduction measures have been taken into account, and demonstrate that this is acceptable for the development;
- Consider if there is a need for the scheme to remain operational during a worst case flood event (the definition of which is to be defined) over the lifetime of the preferred scheme; and
- Provide evidence for the Secretary of State to apply the Sequential Test and Exception Test, as appropriate.

3.1.4. Equivalent guidance is provided in the National Networks NPS, which is also relevant to the Project.

3.2. National Planning Policy Framework

3.2.1. The National Planning Policy Framework (NPPF - 2012) acts as guidance for local planning authorities and decision-makers, both in drawing up plans and making decisions about planning applications. This is supported by online Planning Practice Guidance on Flood Risk and Coastal Change [Ref 2].

3.2.2. In addition, the EA produced updated guidance in 2016 for climate change allowances for FRA to support NPPF (subsequently updated in February 2017) [Ref 3].

3.2.3. Although NPPF and the associated Planning Practice Guidance are not the primary source of planning guidance for NSIP developments, they do provide additional relevant guidance on a range of issues, including the definition of flood zones, development vulnerability classifications, compatibility of development types and flood zones, and appropriate allowances for the effect of climate change.

3.3. Local Planning Policy and Guidance

3.3.1. The principal statutory consultee on flood risk is the Environment Agency. However, on matters concerning works to Ordinary Watercourses, the Lead Local Flood Authorities (LLFAs) are also statutory consultees, which in some cases comprise the local authority and, in others, the unitary authority. A list of applicable Local Authorities and LLFA responsibilities is provided in

3.3.2.

3.3.3. Table 18.4.1.

Table 18.4.1 List of relevant local authorities and LLFA designations

Local authorities likely to be intersected by the Heathrow Expansion Project		
Local Authority	**LLFA Responsibilities**	**LLFA (if other)**
Hillingdon Borough Council	✓	-

Local authorities likely to be intersected by the Heathrow Expansion Project		
Slough Borough Council	✓	-
Spelthorne Borough Council	×	Surrey County Council - Surrey Flood Risk Partnership Board
Hounslow Borough Council	✓	-
Three Rivers District Council	×	Hertfordshire County Council - The Buckinghamshire Strategic Flood Management Committee
South Bucks District Council	×	Buckinghamshire County Council

3.3.4. To meet its statutory requirements under the Flood Risk Regulations 2009 [Ref 4] the Environment Agency has produced Flood Risk Management Plans (FRMP) for a series of River Basin Districts (RBD) throughout England. The Thames FRMP is pertinent to the Project FRA. While in the context of the Project the Thames FRMP is high level, it nonetheless provides a useful insight into the relevant issues in the project area and thus will be reviewed and accounted for in the FRA.

3.3.5. Other sources of information are provided in the respective Local Authority and LLFA documents shown in Table 18.4.2.

Table 18.4.2 List of relevant Local Authority and LLFA documents

	PFRA[1]	SFRA[2]	FRMS[3] or FRMP	SWMP[5]	SuDS[6]	SFG[7]
Hillingdon Borough Council	✓	✓	✓	✓	✓	✓
Slough Borough Council	✓	✓	✓	✓		✓
Spelthorne Borough Council	×	✓	×	×	✓	✓
Hounslow Borough Council	✓	✓	✓ (draft)	✓	×	✓
Three Rivers District Council	×	✓ (1 & 2)	×	×	×	×
South Bucks District Council	✓	✓ (1 & 2)	✓	✓	×	×
Hertfordshire County Council	✓	×	✓	×	×	✓
Surrey County Council	✓	×	✓	×	✓	✓

Buckinghamshire County Council	✗	✗	✓	✗	✗	✓

Notes:
1. Preliminary Flood Risk Assessment
2. Strategic Flood Risk Assessment: unless otherwise stated, all SFRAs are Level 1
3. Flood Risk Management Strategy
4. Flood Risk Management Plan
5. Surface Water Management Plan
6. Sustainable Drainage Systems: where local Authority have produce their own SuDS advice notes
7. Supplemental Flood Guidance: where local Authorities have produced their own supplemental flood risk and/or drainage advice notes

4. Climate Change

4.1. Climate change guidance overview

4.1.1. Overarching guidance on climate change is provided in NPPF (updated 2017) which broadly replicates the guidance set out in in the 'Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities' [Environment Agency, 2016 - Ref 3]. This document is supplemental to 'Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERM-AG)' [Environment Agency, 2010 - Ref 5].

4.2. Climate change allowance: river flow

4.2.1. Peak river flow climate change allowances will be required to determine the appropriate baseline hydrology for hydraulic modelling.

4.2.2. The Environment Agency (2016) also advises that an assessment should be made of the upper end projections to ensure the long-term resilience of the development, noting that the upper end estimate may not be applicable to every site. It is proposed to only provide an assessment of upper end scenarios for permanent infrastructure if applicable.

4.2.3. Peak river allowances for climate change for the Thames RBD, as reported in Environment Agency (2016) are shown in Table 18.4.3.

Table 18.4.3 Peak river flow climate change allowances (use 1961 to 1990)

Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper (90th %ile)	25%	35%	70%
Higher Central (70th %ile)	15%	25%	35%
Central (50th %ile)	10%	15%	25%
Lower (10th %ile)	-5%	0%	5%

4.2.4.

4.2.5.

4.2.6.

4.2.7. Table 18.4.3 also demonstrated that in a number of what are defined as 'non-standard catchments', more extreme projections were observed and are known as H++ scenarios. These H++ allowances are also provided in 'Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities' (2016) and are shown in Table 18.4.4. The application of H++ will be proposed at a later date as the project develops.

Table 18.4.4 H++ peak river flow climate change allowances (use 1961 to 1990)

Non-standard Catchment RBD	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Thames	25%	40%	80%

Note:

H++ allowances taken as 90th percentile from 'Enhanced-High' impact curves for 50-year return period flood peaks, using high emissions for 2080s but medium emissions for 2020s and 2050s (Adaptation Sub-committee, 2015)

4.3. Climate change allowance: rainfall

4.3.1. Rainfall data, principally in the form of Intensity Duration Frequency (IDF) data (otherwise known as Depth Duration Frequency – DDF), may be used to undertake assessments as to the adequacy of drainage schemes, to calculate runoff from construction facilities and calculate design flows at watercourse crossings.

4.3.2. The most up to date guidance was obtained from the 2016 update of the Environment Agency (EA) 'Adapting to Climate Change: Advice for Flood and

Coastal Erosion Risk Management Authorities' (2016) [Ref 3] to ensure that climate change factors have been taken into account.

4.3.3. Peak rainfall intensity allowances for small and urban catchments are shown in Table 18.4.5

Table 18.4.5 Peak rainfall intensity allowance in small and urban catchments

Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

4.3.4. We propose using the rainfall climate change allowances as given in the above table and applying them to 1961-1990 baseline values of IDF/DDF rainfall and rainfall data used in drainage modelling. For the same reasons set out for river flow above, we will only apply the change factor for the 2080s for permanent drainage scheme assessment .

4.3.5. As with river flood flows, it is recommended that the 2080s changes are used when considering any time from 2100 on. The 2020s covers the period 2015 to 2039, the 2050s the period 2040 to 2069, and the 2080s the period 2070 and 2099. These ranges should be used in assessments in a similar way to the illustration set out for river flood flows. Furthermore, no H++ scenarios for rainfall are given in any of the guidance we have reviewed and thus we propose not to include an assessment of H++ scenarios for rainfall.

4.4. Climate change allowance: sea level

4.4.1. Sea level rise is not applicable to the Project as, while all of the diverted watercourses discharge into the Thames at Staines, Staines is well upstream of the accepted tidal limit at Teddington Lock, some 28 km (by river) downstream.

4.5. Climate change and development lifespan

4.5.1. Two time periods are applicable to the FRA. The first is the main construction period, which is expected to occur between 2021 and 2026 (although with some construction continuing until approximately 2035). The second is the operational period, which is assumed to be between 2026 (the year of planned opening of the runway) and between 2070. In summary, we will assume the 2020s scenario is applicable to construction period and the 2080s climate change scenarios to

assess the operational phase. On this basis and we propose the following application of climate change projections:

- For the construction period, stream and river flows will be increased by 10% which represents the change factor for up to the 2020s for the Thames river basin district.
- For operational infrastructure (including all water related elements) stream and river flows will be increased by 25% which represents the change factor for the 2080s for the Thames river basin district.
- Where applicable on the basis of identified risk, we will undertake an assessment of the upper end scenario for up to the 2080s for operational infrastructure and, if required, and will be based on an increase in river flows by 70%.
- Design rainfall (for drainage modelling for example) will be increased by 20% which represents the change factor for the 2080s.

5. FRA Definitions

5.1.1. Throughout this report, 'Annual Exceedance Probability' (AEP) terminology is used to describe the magnitude and likelihood of a flood event. AEP expresses the probability of a flood occurring in a given year. For example, what is often referred to as a '1 in 100 year flood event' will be referred to as a '1% AEP event' (i.e. a flood with a 1 in 100 or 1% probability of occurring in any given year).

5.1.2. Flood Risk Zones are set out as follows:

Flood Zone 1 (Low probability): Land having less than a 1 in 1,000 or 0.1% AEP of river or sea flooding.

Flood Zone 2 (Medium probability): Land having between a 1 in 100 (1%) and 1 in 1,000 (0.1%) AEP of river flooding; or land having between a 1 in 200 (0.5%) and 1 in 1,000 (0.1%) AEP of sea flooding

Flood Zone 3a (High probability): Land having a 1 in 100 (1%) or greater AEP of river flooding; or land having a 1 in 200 (0.5%) or greater AEP of sea flooding.

Flood Zone 3b (Functional Floodplain): Land where water has to flow or be stored in times of flood. Planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the EA. The extent of the 5% AEP event is often used as a proxy for Flood Zone 3b, although it is not part of the official definition.

6. Defining the Flood Hazard Baseline

6.1. Fluvial Flood Hazard Baseline

6.1.1. It is important to highlight the requirement for defining the fluvial baseline, vis a vis:

A) To provide the basis for ensuring that all risks to the Project are appropriately assessed and appropriately mitigated, and

B) To ensure that there is no increase in flood risk to off-site receptors as a result of the development (for example, by ensuring that any losses of floodplain storage are appropriately mitigated in terms of providing new compensatory flood storage zones).

6.1.2. Due to the complex nature of the development, the following states apply

1) Baseline model of existing watercourses required to provide the flood risk hazard baseline (a) off-site, (b) on-site during construction prior to watercourses being diverted, and (c) on-site during operation in areas aside from areas potentially impacted by the proposed watercourse diversions.

2) Baseline model for the operational development once the watercourses have been diverted. This will effectively be the 'new baseline' and the results of the model will be used to update the EA flood risk mapping coverage where applicable.

6.1.3. The baseline fluvial flood hazard throughout the site will be defined by a new hydraulic model that is being developed by the Project team in consultation with the Environment Agency.

6.1.4. This model will consider the two main phases of (i) construction and (ii) operations. Due to the anticipated scale of the development, the construction schedule will extend over a number of years. Accordingly, both the baseline conditions and the effects are expected to be continuously evolving, particularly as elements of the scheme such as the major earthworks, river diversions and new roads are constructed. To take account of this, the FRA will be undertaken for a number of different phases. The assessment will cover the year of maximum effect from construction activities. Additional years may be incorporated, if necessary, to account for factors such as the peak earthworks phase, peak above ground infrastructure construction phase and pre- and post-river diversions.

6.1.5. Firstly, the 0.1%, 1% and 5% AEP flood extents (i.e. Flood Zones 2, 3 and 3b) will be remapped using the new hydraulic model based on input hydrology that will be based on peak river flow allowances for climate change for the Central 2020s scenarios (see Table *18.4.3*) which reflects the baseline during the commencement of the development, anticipated to be in 2021. This includes an allowance for climate change through from the current accepted baseline period of 1961 to 1990.

6.1.6. A further climate change scenario will be run for the 2080s change factor in order to assess future development scenarios as impacted by climate change.

6.2. Surface Water Flood Hazard Baseline

6.2.1. The Environment Agency (EA) currently provides surface water flood risk mapping (also known as pluvial) that is based on hypothetical scenarios in which a design volume of rainfall is assumed not to infiltrate the ground surface and to runoff in accordance with the underlying topography, to include anthropogenic influences.

6.2.2. In order to assess whether the development could increase existing pluvial flood risks, the existing publicly available Environment Agency surface water flood risk mapping will be reviewed to understand existing surface water flow pathways. It is currently assumed that this will be sufficient to inform the FRA. However, if, as work progresses, it becomes clear that that publicly available data is insufficient to robustly assess the impact of the development, including the impacts of climate change, with respect to pluvial flood risk, then the development of a pluvial flood model will be considered at an appropriate scale and in discussion with the Environment Agency.

6.3. Groundwater Flood Hazard Baseline

6.3.1. The primary source of assessing groundwater flood risk in the UK is via the British Geological Survey (BGS) susceptibility to groundwater flooding dataset and mapping (see http://www.bgs.ac.uk/research/groundwater/datainfo/GFSD.html).

6.3.2. The BGS mapping provides three risk classes: A (limited potential for groundwater flooding to occur); B (potential for groundwater flooding of property situated below ground level) and; C (Potential for groundwater flooding to occur at the surface).

6.3.3. While the BGS mapping provides a useful resource for preliminary assessments, its conceptual risk classification approach is not based on physical simulation processes that aim to map actual groundwater flood depths and thus will not provide an adequate basis for more detailed assessments of the potential impacts arising to or from the Project. Moreover, many of the general assumptions used in the BGS approach will not apply around Heathrow given the highly modified nature of the sub-surface, including the presence of landfills.

6.3.4. Currently, Heathrow is developing an approach for groundwater baseline definition and impact assessment and it is anticipated this may involve an element of numerical modelling, proposals for which are outlined in the numerical groundwater modelling Method Statement. It is also planned to use the new groundwater model to test a number of scenarios in order to assess the effects of engineering structures and activities on receptors, and, where those are significant, to assess the performance of mitigation measures to reduce the effects. The effects on groundwater may include the following:

- Changes in groundwater levels and groundwater flow direction due to dewatering during construction

6.3.5. Changes in groundwater flow due to the construction of low permeability barriers below the water table (e.g. sheet piles, coffer dams, tunnels and basements that penetrate the gravel aquifer), as well as high permeability 'drainage' corridors

6.3.6. The likely impact to the flood hazard baseline will be quantified in terms of:

- Changes in groundwater head from the baseline condition;
- Changes in groundwater inflows and outflows to rivers, other surface water features and other areas not defined by river courses from the baseline condition.

6.3.7. Model outputs from the scenario testing will therefore enable an assessment of groundwater flood risk compared to the baseline condition, drawing on information regarding:

- The extent and timing of likely groundwater flooding where modelled groundwater levels rise above the ground surface elevation;

6.3.8. The spatial extent and rate of discharge of groundwater into other areas that are not defined by river courses.

6.3.9.

6.4. Surface Water Runoff and Drainage Baseline

6.4.1. An understanding of the current surface water runoff and drainage baseline will allow a comparison to be made against the post-development drainage, in particular surface water discharges to receiving watercourses to demonstrate no increase in flood risk as a result of the Project.

6.4.2. Runoff rates from the existing partially developed site would be calculated, along with Greenfield runoff rates from the same area, to provide two drainage baseline scenarios for this comparison. Baseline runoff will be calculated in accordance with current good practice, such as given in CIRIA C753. Preliminary and intermediate studies may be based on the UKSUDS online calculation tool (see http://www.uksuds.com/drainage-calculation-tools/greenfield-runoff-rate-estimation), or similar.

6.4.3. There is a variety of drainage infrastructure (i.e. piped networks, constructed wetlands, balancing ponds, spillways, outfall structures etc.) in and around the existing Heathrow site and significant new drainage systems are likely to be proposed as part of the Project. It possible that the new Project drainage system may be combined with existing systems in places.

6.4.4. Because of the potential for the existing Heathrow drainage system to be affected by the Project, and for the new drainage system to interact with the existing system, it is important that the existing drainage baseline captures the conditions of existing Heathrow Environmental Permits concerning surface water discharges

insofar as maximum rates and methods of achieving these rates are all understood for the positively drained areas of the site.

6.5. Reservoir Flood Hazard Baseline

6.5.1. There are a number of sizeable pumped storage surface water reservoirs to the south of the development area, all of which are embanked several metres above the ground level. As such, these reservoirs have no contributing surface water catchments and no surface spillways.

6.5.2. There is a residual risk of breach of the reservoir embankments, though this is of low probability given the stringent regulation of the Reservoirs Act and resultant periodic inspection and maintenance requirements.

6.5.3. The Environment Agency provides reservoir flood risk mapping that assumes a breach at predetermined (due to some conceived weakness) locations in the reservoirs in the area. Heathrow has purchased the reservoir flood risk mapping and this mapping will provide the baseline flood hazard for reservoirs.

6.6. Sewer Flood Hazard Baseline

6.6.1. Currently data holdings with regards to sewer flood records stems from information garnered from those strategic flood risk assessments identified in Table *18.4.2*. As such, this currently is the only basis on which to inform a sewer flood hazard baseline. In 2018 LLFA's and Thames Water will be contacted regarding access to sewer flood records for surface, foul, combined sewers and for highways drainage.

6.6.2. Nonetheless, the information extracted from the aforementioned respective SFRAs will be tabulated and a qualitative baseline established in terms of (a) principal locations at risk of sewer flooding, (b) the typical extent of any sewer floods (which tend to be highly localised).

6.7. Other Artificial Sources of Flood Hazard

6.7.1. Other sources of artificial flood hazard include canals and aqueducts, a number of which can be found upstream of the M4. No flood risk maps exist with which an assessment of risk to the development from artificial sources could be made.

6.7.2. Given the lack of canal failure risk mapping, we will undertake an analysis based on assumed water discharges through potential breaches of the canal network that, for example, could occur at certain elevated reaches, locks and junctions which have been observed upstream of the M4. This analysis will be undertaken in consultation with the Canal and River Trust in order to potentially acquire information on canal geometry, water volumes and infrastructure operation.

6.7.3. The canal breach assessment will enable us to develop risk maps in order to assess whether the effects of any canal breaches may propagate far enough down the Colne Valley such that the Project site and associated developments and construction areas may be impacted.

7. Design Standards and Climate Change Summary

7.1. Overview

7.1.1. This section sets out the design and assessment standards that will underpin the Project FRA, including climate change allowances as discussed in Section 4 of this Method Statement.

Table 18.4.6 Design Standards and Climate Change Requirements

Heathrow Expansion Project: FRA Assessment Scenarios and Development Vulnerability						
Development Type	**Vulnerability Classification**	**Estimated Lifetime**	**Flood Zone Compatibility**		**Climate Change Allowances**	**Discussion / Assumptions**
			Flood Zone 3	**Flood Zone 2**		
1. Infrastructure (Fluvial Risks)						
Runway, aprons, terminals, on-airfield emergency services, public access & egress and M25 and local roads, airfield fuel storage & distribution	Essential Infrastructure	2026 – 2115 (2080s epoch assumed for climate change)	Permitted but Exception Test required, based on worst case event [a,b]	Permitted	Upper End (+70%) for 2080s epoch [f]	a) The Draft Airports NPS[1] states that the applicant should "*Consider if there is a need to remain operational during a worst case flood event over the preferred scheme's lifetime".* b) The determination of a worst case scenario is based on whichever scenario gives the worst case from the 1% AEP event +70% or the 0.1% AEP with no climate change allowance added. c) Other than for essential infrastructure, in demonstrating Part 2 of the Exception Test, the determination of the development element being safe will be based on the design 1% AEP event plus the requisite climate change allowance. d) Throughout the HEP ground levels will be significantly modified such that a new "baseline" flood zone map will be defined that will provide the basis for determining the safety of the operational site and for applying the Sequential and Exception Tests. However, the original baseline will provide the basis for ensuring that the HEP will not result in an increase in flood risk elsewhere in the surrounding area. e) For ancillary infrastructure it is currently assumed that the core functionality and operation of the airport, to include safe access and egress, will be maintained during a worst case flood event although it is assumed that some disruption would be acceptable but that the design and an associated Flood Management Plan (FMP) would ensure it is minimised and that operations and safety will remain sufficiently resilient to flooding during the event and that normal operations would be expediently resumed after the event. f) NPPF[3] states essential infrastructure in FZ2 should "*use the higher central and upper end to assess a range of allowances*", in FZ3a/3b "*use the upper end allowance*" and, less vulnerable in FZ2 "*use the central allowance*", in FZ3a "*use the higher central allowance*". Less vulnerable development not permitted in FZ3b. g) The H++ scenario will only be considered to assess requirements for potential further climate change adaptation measures over the lifetime of the development. No designs will be based on the H++ scenario. h) Central Allowance will be applied for design of any sensitive aspects of this infrastructure such as power supplies or control equipment.
Installations requiring hazardous substances consent (exc. airfield fuel storage and distribution)	Highly Vulnerable		Not permitted	Exception Test required [c]	Higher Central to Upper End (+35 to +70%) [f]	
Landfills	More Vulnerable		Exception Test required [c]	Permitted	Central to Higher Central (+25% to 35%) [f]	
Airfield infrastructure not critical to continued operations during a worst case flood event (i.e. grounds maintenance facilities, car parking etc.) Off-airfield supporting facilities and airport related development (e.g. cargo, freight forwarding, catering, maintenance, logistics, offices etc.)	Less Vulnerable		Permitted	Permitted	Central to Higher Central (+25% to 35%) [f]	
Amenity open space, biodiversity, sports and recreation, flood control infrastructure, sand and gravel working	Water Compatible		Permitted	Permitted	Central (+25%) [h]	
2. Mitigation (Fluvial Risks)						

Heathrow Expansion Project: FRA Assessment Scenarios and Development Vulnerability

Development Type	Vulnerability Classification	Estimated Lifetime	Flood Zone Compatibility		Climate Change Allowances	Discussion / Assumptions
			Flood Zone 3	Flood Zone 2		
River diversions operation	Water Compatible	2026 – 2115 (2080s epoch assumed for climate change)	Permitted	Permitted	Central (+25%) [c]	[a] River diversions and flood storage zones will be designed to ensure that there is no increase in flood risk in the surrounding area (upstream and downstream of the development), to include the appropriate allowance for climate change, as agreed with the Environment Agency (meeting of Sep 28, 20176) [b] Since the river diversion and flood storage compensation schemes are essentially mitigation measures, their design will be considered as part of an integrated flood modelling framework with the overall aims of ensuring that (a) the development is safe, and (b) that there is no increase in flood risk in the surrounding area. [c] The covered river corridor and associated open channel diversion structures will be designed to a 1% AEP +35% (Higher Central) standard in terms of ensuring no increase of flood risk to people and property elsewhere. Furthermore, a +70% climate change allowance (Upper End) will also be used to stress test. [d] The compensatory storage areas will be designed to a 1% AEP +35% (Higher Central) standard in terms of ensuring no increase of flood risk to third parties.
Flood storage zones operation						
3. Flood Protection for Construction (Fluvial Risks)						
Site prep, strip, demolition, earthworks	Less Vulnerable	2021 – 2026 (2020s epoch assumed for climate change)	Permitted	Permitted	Central and Higher Central (+10% and +15%)	[a] Detailed information on construction methods, activities and phasing are not yet available to inform FRA approaches. [b] A site specific sequential approach to flood risk, based on existing mapping, will be taken with respect to the location of construction activities (i.e. construction compounds, welfare/amenity facilities and sensitive plant) in order to steer these elements towards lower risk flood zones. [c] Further to Note b above, it is accepted that construction activities will need to be undertaken in FZ2, 3a and 3b. Therefore, in addition to a sequential approach being taken at the planning stage, the safety of operatives and sensitive plant will be further be subject to the implementation of a rigorous Flood Management Plan. [e] It is anticipated that flood risk mitigation will primarily comprise the provision of robust flood management plans that will be based on existing flood maps to advise egress routes to lowest risk flood zones as opposed to being based on flood modelling output.
Construction of infrastructure						
5. References						
1. Draft Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England. Presented to Parliament pursuant to Section 9(2) of the Planning Act 2008. February 2017.						

Heathrow Expansion Project: FRA Assessment Scenarios and Development Vulnerability						
Development Type	**Vulnerability Classification**	**Estimated Lifetime**	**Flood Zone Compatibility**		**Climate Change Allowances**	**Discussion / Assumptions**
			Flood Zone 3	**Flood Zone 2**		
2. Department for Environment, Food and Rural Affairs Sustainable Drainage Systems Non-statutory technical standards for sustainable drainage systems. March 2015.						
3. Department for Communities and Local government. Flood Risk and Coastal Change (http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/). March 2014.						
4. Flood Risk Assessments: Climate change allowances (https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances). February 2017.						
5. London Sustainable Drainage Action Plan (Draft for consultation) (https://www.london.gov.uk/sites/default/files/lsdap_final.pdf). October 2015.						
6. Minutes of Meeting with Environment Agency and HEP IDT, Arup, London, September 27, 2017.						

8. Baseline Data Sources

8.1. Overview

8.1.1. A variety of input data will be required to inform the FRA baseline and its associated analyses. These can broadly be split into third party data that will either be procured or extracted from public documents and/or websites, and within project.

8.2. Baseline Third Party Data

- OS Mastermap (properties & infrastructure and rivers network layers)
- Flood zones 2 and 3 mapping (from EA)
- Sewer flooding records (from respective local authorities and LLFAs)
- Flood alert and flood warning areas (from EA)
- Spatial flood defences without attributes (from EA)
- Flood storage areas mapping (from EA)
- Recorded flood outlines (from EA)
- Risk of flooding from river or sea mapping (from EA)
- Surface water flood risk mapping (from EA)
- Spatial flood defences with standardised assets (from EA)
- Groundwater flood risk mapping (from British Geological Survey)
- Geological mapping (from British Geological Survey)
- LiDAR (from EA)
- Aerial photography (provided under license from project data team)
- Hydraulic models (Lower Colne Catchment and Colne upstream of Denham)
- Observed river flow data
- Sewer network maps from Thames Water
- Sewer flooding records from Thames Water and LLFAs
- Details of Reservoir operation including location and type of spillways
- Assumptions behind EA's reservoir breach modelling in the area e.g. location of breaches- are these sufficient for what we need?

- Historic flood maps

8.3. Baseline Data Generated By Analyses

8.3.1. Baseline data generated by analyses includes:

- FEH DDF rainfall
- Greenfield runoff rates (UKSUDS on line tool)
- Flow statistics (from observed flow data)
- Fluvial flood levels (from modelling described in Section 6.1)
- Surface water flood depths (from new HAL model of SW flooding)
- Groundwater levels (from new HAL groundwater model)
- Reservoir flood depths (from EA model output and topo analysis)
- Drainage outputs (from HAL drainage strategy and modelling)

9. Glossary

Term/ abbreviation	Description
AEP	Annual exceedance probability
BGS	British Geological Society
DCO	Development consent order
DDF	Depth duration frequency
EA	Environment Agency
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESR	Environmental Scoping Report
FCERM-AG	Flood and coastal erosion risk management – appraisal guidance
FRA	Flood risk assessment
FRMP	Flood risk management plan
HAL	Heathrow Airport Limited
IDF	Intensity depth duration
LLFA	Lead local flood authority
NPS	National policy statement
NPPF	National Planning Policy Framework
NSIP	Nationally significant infrastructure project
PINS	Planning Inspectorate
RBD	River basin district

10. Bibliography

Creator	Title	Publisher and place of publication	Date of publication
Department for Transport	Draft Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England	Her Majesty's Stationary Office	October 2017
Department for Communities and Local Government	National Planning Policy Framework: Flood Risk and Coastal Change	https://www.gov.uk/guidance/flood-risk-and-coastal-change	Mar 2014
The Environment Agency	Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities	The Environment Agency (Online: https://www.gov.uk/government/publications/adapting-to-climate-change-for-risk-management-authorities	Sep 2011 (Updated Apr 2016)

Legislation.gov.uk	Flood Risk Regulations	Legislation.gov.uk	2009
The Environment Agency	Flood and Coastal Erosion Risk Management appraisal guidance	The Environment Agency	Mar 2010

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Appendix 18.5
WFD Water Bodies

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WFD Waterbody Information (extracted from Catchment Data Explorer, February 2018)									
WFD Waterbody Name	**WFD Waterbody ID**	**River Basin District / River Basin Management Plan**	**Operational Catchment**	**Waterbody Designation**	**Waterbody Type**	**Overall Status (2016)**	**Ecological Status (2016)**	**Chemical Status (2016)**	**Elements not achieving Good (2016)**
LOCAL SURFACE WATER STUDY AREA									
Rivers									
Colne Brook	GB106039023010	Thames	Colne	HMWB	River	Moderate	Moderate	Good	Fish (Moderate) Phosphate (Poor) Mitigation Measures Assessment (Moderate)
Crane	GB106039023030	Thames	Crane Rivers and Lakes	not HMWB	River	Poor	Poor	Good	Fish (Moderate) Invertebrates (Moderate) Macrophytes and phytobenthos (Poor) Hydrological regime (Does not support good) Dissolved oxygen (Moderate) Phosphate (Poor)
Horton Brook	GB106039023040	Thames	Colne	not HMWB	River	Moderate	Moderate	Good	Invertebrates (Moderate) Phosphate (Moderate)
Colne (Confluence with Chess to River Thames)	GB106039023090	Thames	Colne	HMWB	River	Moderate	Moderate	Good	Hydrological regime (does not support good) Phosphate (Poor) Mitigation Measures Assessment (Moderate)
Surrey Ash	GB106039023480	Thames	Colne	HMWB	River	Moderate	Moderate	Good	Phosphate (Moderate) Mitigation Measures Assessment (Moderate)
Portlane Brook	GB106039023451	Thames	Crane Rivers and Lakes	HMWB	River	Moderate	Moderate	Good	Invertebrates (Moderate) Phosphate (Moderate) Mitigation Measures Assessment (Moderate)
Surface water transfers									
Upper Duke of Northumberland's River	GB806100108	Thames	Crane SWT	AWB	Surface Water Transfer	Moderate	Moderate	Good	Mitigation Measures Assessment (Moderate)
Longford River	GB806100109	Thames	Crane SWT	AWB	Surface Water Transfer	Moderate	Moderate	Good	Mitigation Measures Assessment (Moderate)
Lower Duke of Northumberland's River	GB806100095	Thames	Crane SWT	AWB	Surface Water Transfer	Moderate	Moderate	Good	Mitigation Measures Assessment (Moderate)
Lakes									
The Queen Mother Reservoir	GB30642334	Thames	Colne	AWB	Lake	Moderate	Moderate	Good	Mitigation Measures Assessment (Moderate)
Wraysbury Reservoir	GB30642417	Thames	Colne	AWB	Lake	Moderate	Moderate	Good	Total phosphorus (Bad) Mitigation Measures Assessment (Moderate)
Wraysbury Lake (Wraysbury No1 Gravel Pit)	GB30642430	Thames	Thames Lower	AWB	Lake	Poor	Poor	Good	Macrophytes and Phytobenthos Combined (Poor) Phytoplankton (Moderate) Mitigation Measures Assessment (Moderate)
King George VI Reservoir	GB30642488	Thames	Colne	AWB	Lake	Moderate	Moderate	Good	Phytoplankton (Moderate) Total phosphorus (Poor) Mitigation Measures Assessment (Moderate)
Wraysbury No 2 (Wraysbury II Gravel Pit/ Wellapool Lake)	GB30642489	Thames	Colne	AWB	Lake	Moderate	Moderate	Good	Mitigation Measures Assessment (Moderate)
Staines Reservoir (North)	GB30642490	Thames	Colne	AWB	Lake	Moderate	Moderate	Good	Total phosphorus (Bad) Mitigation Measures Assessment (Moderate)
Staines Reservoir (South)	GB30642525	Thames	Colne	AWB	Lake	Moderate	Moderate	Good	Phytoplankton (Moderate) Total phosphorus (Bad) Mitigation Measures Assessment (Moderate)
Heron Lake	GB30642538	Thames	Colne	AWB	Lake	Moderate	Moderate	Good	Mitigation Measures Assessment (Moderate)
GROUNDWATER STUDY AREA									
Lower Thames Gravels	GB40603G000300	Thames GW	Colne GW	n/a	Groundwater	Good	Good	Good	n/a
WIDER SURFACE WATER STUDY AREA									
Rivers									
Pinn	GB106039023070	Thames	Colne	HMWB	River	Moderate	Moderate	Good	Phosphate (Moderate) Mitigation Measures Assessment (Moderate)
Alderbourne	GB106039023080	Thames	Colne	not HMWB	River	Moderate	Moderate	Good	Macrophytes and Phytobenthos combined (Moderate) Hydrological regime (Does not support good)
Tykeswater	GB106039023100	Thames	Cole	not HMWB	River	Moderate	Moderate	Good	Macrophytes and Phytobenthos combined (Moderate) Hydrological regime (Does not support good) Phosphate (Poor)
Upper Colne and Ellen Brook	GB106039029820	Thames	Colne	not HMWB	River	Poor	Poor	Good	Invertebrates (Moderate) Macrophytes and Phytobenthos combined (Poor) Hydrological regime (does not support good) Dissolved oxygen (Moderate) Phosphate (Moderate)
Misbourne	GB106039029830	Thames	Colne	not HMWB	River	Moderate	Moderate	Good	Fish (Moderate) Macrophytes and Phytobenthos combined (Moderate) Hydrological regime (Does not support good)
Colne (from confluence with Ver to Gade)	GB106039029840	Thames	Colne	not HMWB	River	Moderate	Moderate	Good	Macrophytes and Phytobenthos combined (Moderate) Hydrological regime (Does not support good) Phosphate (Moderate)
Colne (upper east arm inlcuding Mimshall Brook)	GB106039029850	Thames	Colne	not HMWB	River	Bad	Bad	Good	Fish (Bad) Invertebrates (Poor) Macrophytes and Phytobenthos combined (Moderate) Phosphate (Moderate)

Gade (from confluence with Bulbourne to Chess)	GB106039029860	Thames	Colne	HMWB	River	Poor	Poor	Good	Macrophytes and Phytobenthos combined (Poor) Hydrologyical regime (Does not support good) Phosphate (Moderate) Mitigation Measures Assessment (Moderate)
Chess	GB106039029870	Thames	Colne	not HMWB	River	Moderate	Moderate	Good	Fish (Moderate) Macrophytes and Phytobenthos combined (Moderate) Hydrological regime (Does not support good) Phosphate (Poor)
Bulbourne	GB106039029890	Thames	Colne	HMWB	River	Poor	Poor	Good	Invertebrates (Moderate) Macrophytes and phytobenthos (Poor) Hydrological regime (Does not support good) Mitigation Measures Assessment (Moderate)
Gade (Upper stretch Great Gaddesden to confluence with Bulbourne/GUC)	GB106039029900	Thames	Colne	not HMWB	River	Bad	Bad	Good	Macrophytes and Phytobenthos combined (Bad) Hydrologyical regime (Does not support good) Dissolved oxygen (Moderate)
Ver	GB106039029920	Thames	Colne	not HMWB	River	Moderate	Moderate	Good	Macrophytes and Phytobenthos combined (Moderate) Hydrological regime (Does not support good) Dissolved oxygen (Moderate)
Yeading Brook	GB106039023051	Thames	Crane Rivers and Lakes	HMWB	River	Moderate	Moderate	Good	Invertebrates (Poor) Ammonia (Poor) Dissolved oxygen (Bad) Phosphate (Poor) Mitigation Measures Assessment (Moderate)
Thames (Cookham to Egham)	GB106039023231	Thames	Thames Lower	HMWB	River	Moderate	Moderate	Good	Phosphate (Moderate) Mitigation Measures Assessment (Moderate)
Thames (Egham to Teddington)	GB106039023232	Thames	Thames Lower	HMWB	River	Poor	Poor	Good	Macrophytes and Phytobenthos Combined (Poor) Phosphate (Moderate) Temperature (Moderate) Mitigation Measures Assessment (Moderate)
Transitional									
THAMES UPPER	GB530603911403	Thames	Thames TraC	HMWB	Transitional Water	Moderate	Moderate	Fail	Hydrological regime (Does not support good) Mitigation Measures Assessment (Moderate) Tributyltin compounds (Fail)

Appendix 18.6
Abstraction

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FID	LIC_NO	POINT_NAME	PURPOSE	SUBPURPOSE	USE	Source	Aquifer	Start month	End month	Receptor group
0	28/39/26/0071	MONKEY ISLAND LANE POINT 'A'	Industrial, Commercial And Public Services	Mineral Products	Mineral Washing	GW	River Gravels	1	12	WE12
1	28/39/26/0077	BOREHOLE 'B' AT WATER OAKLEY FARM, WINDSOR, BERKS	Agriculture	General Agriculture	Spray Irrigation - Spray Irrigation Definition Order	GW	River Gravels	10	9	WE12
2	28/39/26/0077	BOREHOLE 'C' AT WATER OAKLEY FARM, WINDSOR, BERKS	Agriculture	General Agriculture	General Farming & Domestic	GW	River Gravels	10	9	WE12
3	28/39/26/0133	BRAY GRAVEL PIT POINT 'A'	Industrial, Commercial And Public Services	Mineral Products	General Use Relating To Secondary Category (Medium Loss)	GW	River Gravels	4	3	WE12
4	28/39/27/0003	DATCHET PUMPING STATION 'A'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk	1	12	WE13
5	28/39/27/0003	DATCHET PUMPING STATION 'B'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk	1	12	WE13
6	28/39/27/0003	DATCHET PUMPING STATION 'C'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk	1	12	WE13
7	28/39/27/0003	DATCHET PUMPING STATION 'D'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk	1	12	WE13
8	28/39/27/0003	DATCHET PUMPING STATION 'E'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk	1	12	WE13
9	28/39/27/0003	DATCHET PUMPING STATION 'F'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk	1	12	WE13
10	28/39/27/0003	DATCHET PUMPING STATION 'G'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk	1	12	WE13
11	28/39/27/0003	DATCHET PUMPING STATION 'K'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk	1	12	WE13
12	28/39/27/0003	DATCHET PUMPING STATION 'L'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk	1	12	WE13
13	28/39/27/0033	CHERTSEY PUMPING STATION POINT J	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	River Gravels	4	3	WE12
14	28/39/27/0045	SLOUGH SEWAGE TREATMENT WORKS - WELL 'B'	Water Supply	Public Water Supply	General Use Relating To Secondary Category (Medium Loss)	GW	River Gravels	1	12	WE12
15	28/39/27/0045	SLOUGH SEWAGE TREATMENT WORKS - WELL 'C'	Water Supply	Public Water Supply	General Use Relating To Secondary Category (Medium Loss)	GW	River Gravels	1	12	WE12
16	28/39/27/0045	SLOUGH SEWAGE TREATMENT WORKS - WELL 'D'	Water Supply	Public Water Supply	General Use Relating To Secondary Category (Medium Loss)	GW	River Gravels	1	12	WE12
17	28/39/27/0047	CLEWER MILL STREAM AT WINDSOR RACECOURSE	Industrial, Commercial And Public Services	Racecourses	Spray Irrigation - Direct	SW		1	12	WE8
18	28/39/27/0047	RIVER THAMES AT WINDSOR RACECOURSE	Industrial, Commercial And Public Services	Racecourses	Spray Irrigation - Direct	SW		1	12	WE8
19	28/39/27/0050	W/COURSE WITH LAKE AT ROWLEY FARM RIVER FRONTAGE 'A' & 'B'	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		6	9	WE1
20	28/39/27/0063	ETON COLLEGE, WINDSOR BH 'A'	Industrial, Commercial And Public Services	Schools And Colleges	Make-Up Or Top Up Water	GW	River Gravels	1	12	WE12
21	28/39/27/0064	RIVER THAMES AT SUNNYMEADS PUMPING STATION INTAKE	Water Supply	Public Water Supply	Potable Water Supply - Direct	SW		1	12	WE8
22	28/39/27/0092	ETON PUMPING STATION	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	Chalk & River Gravels	1	12	WE12, WE13
23	28/39/27/0094	LALEHAM GOLF CLUB- BOREHOLE B	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	River Gravels	2	9	WE12
24	28/39/27/0104	STAINES WORKS PUMPING STATION (EMERGENCY)	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	River Gravels	1	12	WE12
25	28/39/27/0110	SLOUGH NURSERIES, UXBRIDGE ROAD, SLOUGH	Agriculture	General Agriculture	General Farming & Domestic	GW	Chalk	1	12	WE13
26	28/39/27/0111	HOME PARK, WINDSOR BH 'A'	Industrial, Commercial And Public Services	Municipal Grounds	Spray Irrigation - Direct	GW	River Gravels	4	8	WE12
27	28/39/27/0117	STOKE POGES GARDENS OF REMEMBRANCE, BUCKS	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Spray Irrigation - Direct	GW	Chalk	3	11	WE13
28	28/39/27/0125/R01	ROWING LAKE AT DORNEY, BERKS BH 'A'	Agriculture	General Agriculture	General Farming & Domestic	GW	Chalk	4	3	WE13
29	28/39/27/0125/R01	ROWING LAKE AT DORNEY, BERKS BH 'A'	Environmental	Non-Remedial River/Wetland Support	Transfer Between Sources (Post Water Act 2003)	GW	Chalk	4	3	WE13
30	28/39/27/0130	STOKE POGES LANE, SLOUGH - WELL	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Non-Evaporative Cooling	GW	River Gravels	1	12	WE12
31	28/39/27/0131	STOKE POGES LANE, SLOUGH - BOREHOLE 'C'	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Process Water	GW	Lower Greensand	1	12	WE13
32	28/39/27/0141	WEXHAM PARK GOLF COURSE, SLOUGH-BOREHOLE	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	Chalk	4	9	WE13
33	28/39/27/0142	FARNHAM PARK GOLF COURSE, STOKE POGES, SLOUGH	Industrial, Commercial And Public Services	Municipal Grounds	Spray Irrigation - Direct	GW	Chalk	4	10	WE13
34	28/39/27/0143	HIGHFIELD FARM, PURTON LNE, FARNHAM COMMON, SL2 - BOREHOLE	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	Chalk	4	10	WE13
35	28/39/28/0008	BOREHOLE AT WHITELYS PARADE	Industrial, Commercial And Public Services	Laundry	Laundry Use	GW	River Gravels	4	3	WE12
36	28/39/28/0067	POINT 'A' AT HITHERMOOR ROAD, STANWELL MOOR, MIDDLESEX	Industrial, Commercial And Public Services	Mineral Products	Mineral Washing	GW	Unspecified aquifer	1	12	WE12/WE13
37	28/39/28/0067	SHEPPERTON GRAVEL AT HITHERMOOR ROAD, STANWELL MOOR, MIDDLES	Industrial, Commercial And Public Services	Mineral Products	Dust Suppression	GW	River Gravels	4	3	WE12
38	28/39/28/0067	SHEPPERTON GRAVEL AT HITHERMOOR ROAD, STANWELL MOOR, MIDDLES	Industrial, Commercial And Public Services	Mineral Products	General Washing/Process Washing	GW	River Gravels	4	3	WE12
39	28/39/28/0067	SHEPPERTON GRAVEL AT HITHERMOOR ROAD, STANWELL MOOR, MIDDLES	Industrial, Commercial And Public Services	Mineral Products	Mineral Washing	GW	River Gravels	4	3	WE12
40	28/39/28/0067	SHEPPERTON GRAVEL AT HITHERMOOR ROAD, STANWELL MOOR, MIDDLES	Industrial, Commercial And Public Services	Mineral Products	Process Water	GW	River Gravels	4	3	WE12
41	28/39/28/0079	REACH A-B ON RIVER ALDERBOURNE AT MANSFIELD FARM, IVER HEATH	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE10
42	28/39/28/0079	REACH C-D ON RIVER ALDERBOURNE AT MANSFIELD FARM, IVER HEATH	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE10
43	28/39/28/0105	BOREHOLE AT IVER, BUCKS		Horticulture And Nurseries	Spray Irrigation - Direct	GW	Chalk	4	3	WE13
44	28/39/28/0204	BOREHOLE 'B' AT BERKYN MANOR, HORTON	Agriculture	General Agriculture	General Farming & Domestic	GW	River Gravels	1	12	WE12
45	28/39/28/0204	WELL 'A' AT BERKYN MANOR, HORTON	Agriculture	General Agriculture	General Farming & Domestic	GW	River Gravels	1	12	WE12
46	28/39/28/0301	POINT C ON RIVER COLNBROOK AT HORTON MANOR FARM	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE1
47	28/39/28/0301	POINT M ON COLNBROOK AT BERKIN MANOR FARM	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE1
48	28/39/28/0301	POINTS D TO E FROM RIVER COLNBROOK AT HORTON MANOR FARM	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE1
49	28/39/28/0301	POINTS F TO G ON RIVER COLNBROOK AT HORTON MANOR FARM	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE2
50	28/39/28/0301	POINTS H TO J ON RIVER COLNBROOK AT BERKIN MANOR	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE2
51	28/39/28/0301	POINTS K TO L ON UN-NAMED WATERCOURSE ATSUTTON FARM	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE1
52	28/39/28/0301	POINTS N TO P ON RIVER COLNBROOK AT BERKIN MANOR FARM	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE2
53	28/39/28/0301	RIVER COLNBROOK AT POINTS A TO B, HORTON MANOR FARM	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		4	9	WE1
54	28/39/28/0401	HERON LAKE EMERGENCY PUMPING STATION	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	River Gravels	4	3	WE12
55	28/39/28/0401	QUEENSMEAD EMERGENCY PUMPING STATION	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	River Gravels	4	3	WE12
56	28/39/28/0510	COLNE BROOK AT THORNEY FARM, IVER	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Storage	SW		11	3	WE2
57	28/39/28/0513	HILLINGDON HOSPITAL - BOREHOLE	Industrial, Commercial And Public Services	Hospitals	Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services	GW	Unspecified aquifer	1	12	WE12/WE13
58	28/39/28/0513	HILLINGDON HOSPITAL- BOREHOLE	Industrial, Commercial And Public Services	Hospitals	Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services	GW	Chalk	1	12	WE13
59	28/39/28/0520	COLNE BROOK AT ARTHUR JACOB NATURE RESERVE	Environmental	Non-Remedial River/Wetland Support	Make-Up Or Top Up Water	SW		11	3	WE2
60	28/39/28/0526	POND AT SHREDDING GREEN FARM, IVER	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	3	10	WE12
61	28/39/28/0526	WELL AT SHREDDING GREEN FARM, IVER	Agriculture	General Agriculture	General Farming & Domestic	GW	River Gravels	1	12	WE12
62	28/39/28/0576	IVER SOUTH STW, IVER-BOREHOLE A	Water Supply	Water Supply Related	General Use Relating To Secondary Category (High Loss)	GW	Unspecified aquifer	1	12	WE12/WE13
63	28/39/28/0576	IVER SOUTH STW, IVER-BOREHOLE A	Water Supply	Water Supply Related	Process Water	GW	Unspecified aquifer	1	12	WE12/WE13
64	28/39/28/0576/R01	IVER SOUTH STW, IVER-BOREHOLE A	Water Supply	Water Supply Related	Process Water	GW	Chalk	4	3	WE13
65	28/39/28/0580	POYLE QUARRY, OLD BATH ROAD, COLNBROOK- POINT A	Industrial, Commercial And Public Services	Extractive	Mineral Washing	GW	Unspecified aquifer	1	12	WE12/WE13
66	28/39/28/0586	RIVER COLNE - ABOVE A3113 AIRPORT WAY, STAINES	Environmental	Non-Remedial River/Wetland Support	Supply To A Leat For Throughflow	SW		1	12	WE4
67	28/39/28/0590/R01	SHREDDING GREEN FARM, IVER -BOREHOLE	Agriculture	General Agriculture	Transfer Between Sources (Post Water Act 2003)	GW	Chalk	3	9	WE13
68	28/39/28/0614/R01	HORTON BROOK, NORTH PARK, RICHINGS PARK, IVER	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Storage	SW		11	3	WE1
69	28/39/29/0001	CLOCKHOUSE LANE NURSERY, THORPE LEA WELL 'B'	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	4	9	WE12
70	28/39/29/0001	CLOCKHOUSE LANE NURSERY, THORPE LEA WELL 'B'	Agriculture	General Agriculture	Spray Irrigation - Spray Irrigation Definition Order	GW	River Gravels	1	12	WE12
71	28/39/29/0038	THE GREEN LANDSCAPE NURSERY, EGHAM WELL 'B'	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	3	10	WE12
72	28/39/29/0038	THE GREEN LANDSCAPE NURSERY, EGHAM WELL 'B'	Agriculture	General Agriculture	Spray Irrigation - Spray Irrigation Definition Order	GW	River Gravels	1	12	WE12
73	28/39/29/0040	POINT A, RUMBA RAPIDS, THORPE PARK, CHERTSEY	Industrial, Commercial And Public Services	Holiday Sites, Camp Sites & Tourist Attractions	Lake & Pond Throughflow	GW	River Gravels	2	11	WE12
74	28/39/29/0040	POINT A, RUMBA RAPIDS, THORPE PARK, CHERTSEY	Industrial, Commercial And Public Services	Holiday Sites, Camp Sites & Tourist Attractions	Lake & Pond Throughflow	GW	River Gravels	4	9	WE12
75	28/39/29/0042	CEMEX HOUSE COLDHARBOUR LANE THORPE EGHAM - BOREHOLE	Amenity	Industrial/Commercial/Energy/Public Services	Lake & Pond Throughflow	GW	River Gravels	4	3	WE12
76	28/39/29/0056/R01	TIDAL WAVE, THORPE PARK, STAINES, POINT 'A'	Industrial, Commercial And Public Services	Holiday Sites, Camp Sites & Tourist Attractions	Make-Up Or Top Up Water	GW	River Gravels	3	11	WE12
77	28/39/31/0004	ASHFORD MANOR GOLF CLUB - WELL	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	River Gravels	4	3	WE12
78	28/39/31/0006	RIVER ASH AT LITTLETON NURSERIES		Horticulture And Nurseries	Spray Irrigation - Direct	SW		5	10	WE4
79	28/39/31/0009	WATERSPLASH FARM, SHEPPERTON - WELL	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	5	9	WE12
80	28/39/31/0010	RIVER ASH AT WATERSPLASH FARM, SHEPPERTON	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		5	9	WE4
81	28/39/31/0021	THREE BOREHOLES AT SUNBURY WAY, HANWORTH, FELTHAM	Industrial, Commercial And Public Services	Dairies	General Washing/Process Washing	GW	River Gravels	1	12	WE12
82	28/39/31/0030	BP RESEARCH CENTRE, SUNBURY-ON-THAMES- BOREHOLE B	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services	GW	River Gravels	1	12	WE12
83	28/39/31/0030	BP RESEARCH CENTRE, SUNBURY-ON-THAMES- BOREHOLE B	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Horticultural Watering	GW	River Gravels	1	12	WE12
84	28/39/31/0030	BP RESEARCH CENTRE, SUNBURY-ON-THAMES- BOREHOLE B	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Non-Evaporative Cooling	GW	River Gravels	1	12	WE12
85	28/39/31/0030	BP RESEARCH CENTRE, SUNBURY-ON-THAMES- BOREHOLE B	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Process Water	GW	River Gravels	1	12	WE12
86	28/39/31/0030	BP RESEARCH CENTRE, SUNBURY-ON-THAMES- BOREHOLE C	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services	GW	River Gravels	1	12	WE12
87	28/39/31/0030	BP RESEARCH CENTRE, SUNBURY-ON-THAMES- BOREHOLE C	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Horticultural Watering	GW	River Gravels	1	12	WE12
88	28/39/31/0030	BP RESEARCH CENTRE, SUNBURY-ON-THAMES- BOREHOLE C	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Non-Evaporative Cooling	GW	River Gravels	1	12	WE12
89	28/39/31/0030	BP RESEARCH CENTRE, SUNBURY-ON-THAMES- BOREHOLE C	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Process Water	GW	River Gravels	1	12	WE12
90	28/39/31/0046	BOREHOLE 'A' AT UPPER HALIFORD, SHEPPERTON	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	4	9	WE12
91	28/39/31/0046	BOREHOLE 'B' AT UPPER HALIFORD, SHEPPERTON	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	4	9	WE12

92	28/39/31/0065	ASHFORD COMMON POINT A	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	River Gravels	11	2	WE12
93	28/39/31/0065	ASHFORD COMMON POINT B	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	River Gravels	11	2	WE12
94	28/39/31/0074	KEMPTON PARK, SUNBURY-ON-THAMES- WELL	Industrial, Commercial And Public Services	Racecourses	Spray Irrigation - Direct	GW	River Gravels	10	9	WE12
95	28/39/31/0086	NO 9 HOLDING, ASHFORD ESTATE - WELL	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	Unspecified aquifer	1	12	WE12/WE13
96	28/39/31/0086	NO 9 HOLDING, ASHFORD ESTATE - WELL	Agriculture	General Agriculture	Spray Irrigation - Spray Irrigation Definition Order	GW	Unspecified aquifer	1	12	WE12/WE13
97	28/39/31/0096	WELL 'B' AT FORDBRIDGE ROAD, SUNBURY-ON-THAMES		Holiday Sites, Camp Sites & Tourist Attractions	General Use Relating To Secondary Category (Medium Loss)	GW	River Gravels	1	12	WE12
98	28/39/31/0101	WELL AT STAINES ROAD, BEDFONT	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	4	10	WE12
99	28/39/31/0113	SHEPPERTON LANE, LALEHAM - WET PIT C	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	3	10	WE12
100	28/39/31/0125	HAMPTON COURT PALACE GOLF CLUB- BOREHOLE	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	River Gravels	4	10	WE12
101	28/39/31/0132	RIVER ASH AT HALLIFORD ROAD, SHEPPERTON-ON-THAMES	Agriculture	General Agriculture	Spray Irrigation - Direct	SW		3	10	WE4
102	28/39/31/0134	WALTON BRIDGE PUMPING STATION 'B'	Water Supply	Public Water Supply	Potable Water Supply - Direct	GW	River Gravels	1	12	WE12
103	28/39/31/0144	MAYFIELD FARM, STAINES ROAD, BEDFONT (WELL)	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	3	9	WE12
104	28/39/31/0146	BRIDGE FARM NURSERY, CLOCKHOUSE LANE-BOREHOLE 'A'	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	10	9	WE12
105	28/39/31/0146	BRIDGE FARM NURSERY, CLOCKHOUSE LANE-BOREHOLE 'A'	Agriculture	General Agriculture	Spray Irrigation - Spray Irrigation Definition Order	GW	River Gravels	10	9	WE12
106	28/39/31/0152	BOREHOLE 'A' AT HANWORTH, MIDDLESEX	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	2	11	WE12
107	28/39/31/0152	BOREHOLE 'A' AT HANWORTH, MIDDLESEX	Agriculture	General Agriculture	Spray Irrigation - Spray Irrigation Definition Order	GW	River Gravels	1	12	WE12
108	28/39/31/0167	BOREHOLE 'A' AT HAZELWOOD GOLF CLUB, CROYSDALE AVENUE	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	River Gravels	10	9	WE12
109	28/39/31/0168	LITTLETON LANE, SHEPPERTON- POINT A	Industrial, Commercial And Public Services	Construction	General Washing/Process Washing	GW	River Gravels	1	12	WE12
110	28/39/31/0172	HAMPTON POOL BOREHOLE	Industrial, Commercial And Public Services	Sports Grounds/Facilities	General Use Relating To Secondary Category (Medium Loss)	GW	River Gravels	1	12	WE12
111	28/39/31/0176/R01	NOTCUTTS GARDEN CENTRE-WELL	Agriculture	Horticulture And Nurseries	Spray Irrigation - Direct	GW	River Gravels	4	3	WE12
112	28/39/31/0176/R01	NOTCUTTS GARDEN CENTRE-WELL	Agriculture	Horticulture And Nurseries	Spray Irrigation - Spray Irrigation Definition Order	GW	River Gravels	4	3	WE12
113	28/39/31/0185	CLOCK HOUSE LANE PIT-GRAVEL	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	General Use Relating To Secondary Category (High Loss)	GW	Unspecified aquifer	1	12	WE12/WE13
114	28/39/31/0185	CLOCK HOUSE LANE PIT-GRAVEL	Industrial, Commercial And Public Services	Transport	Evaporative Cooling	GW	River Gravels	4	3	WE12
115	28/39/31/0185	CLOCK HOUSE LANE PIT-GRAVEL	Industrial, Commercial And Public Services	Transport	General Use Relating To Secondary Category (High Loss)	GW	River Gravels	4	3	WE12
116	28/39/31/0189	HENGROVE FARM GRAVEL PIT	Industrial, Commercial And Public Services	Mineral Products	Mineral Washing	GW	Unspecified aquifer	1	12	WE12/WE13
117	28/39/31/0189/R01	HENGROVE FARM GRAVEL PIT	Industrial, Commercial And Public Services	Mineral Products	Mineral Washing	GW	River Gravels	4	3	WE12
118	28/39/34/0007	BOREHOLE AT LENSBURY CLUB, TEDDINGTON	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	River Gravels	4	3	WE12
119	28/39/34/0010	BOREHOLE 'A' AT LENSBURY CLUB, TEDDINGTON	Industrial, Commercial And Public Services	Sports Grounds/Facilities	Spray Irrigation - Direct	GW	River Gravels	3	10	WE12
120	28/39/34/0010	BOREHOLE 'A' AT LENSBURY CLUB, TEDDINGTON	Water Supply	Private Water Undertaking	Spray Irrigation - Direct	GW	River Gravels	3	10	WE12
121	28/39/36/0023	BOREHOLE 'A' AT HOME FARM, HARMONDSWORTH	Agriculture	General Agriculture	General Farming & Domestic	GW	River Gravels	1	12	WE12
122	28/39/36/0023	BOREHOLE 'B' AT HOME FARM, HARMONDSWORTH	Agriculture	General Agriculture	General Farming & Domestic	GW	River Gravels	1	12	WE12
123	28/39/36/0023	BOREHOLE 'C' AT HOME FARM, HARMONDSWORTH	Agriculture	General Agriculture	General Farming & Domestic	GW	River Gravels	1	12	WE12
124	28/39/36/0035	BOREHOLE AT RECTORY FARM, BATH ROAD, CRANFORD	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	Unspecified aquifer	4	9	WE12/WE13
125	28/39/36/0038	GRAND UNION CANAL AT STOCKLEY ROAD, WEST DRAYTON.	Industrial, Commercial And Public Services	Mineral Products	Process Water	SW		1	12	WE10
126	28/39/36/0058	BOREHOLE AT NORTHROP ROAD, HEATHROW AIRPORT, HOUNSLOW	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Process Water	GW	River Gravels	1	12	WE12
127	28/39/36/0059	WET PIT AT SIPSON LANE, HARMONDSWORTH	Industrial, Commercial And Public Services	Mineral Products	Mineral Washing	GW	River Gravels	1	12	WE12
128	28/39/36/0060	WET PIT AT HIGH STREET, HARLINGTON, MIDDLESEX	Industrial, Commercial And Public Services	Mineral Products	Mineral Washing	GW	River Gravels	1	12	WE12
129	28/39/36/0069	STOCKLEY PARK , UXBRIDGE (BOREHOLE)	Industrial, Commercial And Public Services	Golf Courses	General Washing/Process Washing	GW	Unspecified aquifer	11	3	WE12/WE13
130	28/39/36/0069	STOCKLEY PARK , UXBRIDGE (BOREHOLE)	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	Unspecified aquifer	4	10	WE12/WE13
131	28/39/36/0070	HARMONDSWORTH QUARRY, WEST DRAYTON-LAGOON	Industrial, Commercial And Public Services	Extractive	Mineral Washing	GW	Unspecified aquifer	1	12	WE12/WE13
132	28/39/36/0072	NESTLE COFFEE FACTORY-BOREHOLE	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Evaporative Cooling	GW	Unspecified aquifer	1	12	WE12/WE13
134	28/39/36/0075	GRAND UNION CANAL AT UBS DATA PROCESSING CENTRE, HAYES	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	Non-Evaporative Cooling	SW		4	3	WE10
135	28/39/37/0005	BOREHOLE 'A' AT SYON PARK, BRENTFORD	Agriculture	Horticulture And Nurseries	Horticultural Watering	GW	River Gravels	1	12	WE12
136	28/39/37/0005	BOREHOLE 'A' AT SYON PARK, BRENTFORD	Agriculture	Horticulture And Nurseries	Spray Irrigation - Direct	GW	River Gravels	10	9	WE12
137	28/39/37/0005	BOREHOLE 'B' AT SYON PARK, BRENTFORD	Agriculture	Horticulture And Nurseries	Horticultural Watering	GW	River Gravels	1	12	WE12
138	28/39/37/0005	BOREHOLE 'B' AT SYON PARK, BRENTFORD	Agriculture	Horticulture And Nurseries	Spray Irrigation - Direct	GW	River Gravels	10	9	WE12
140	28/39/M/0002	RIVER THAMES AT M2 DATCHET INTAKE T10	Water Supply	Public Water Supply	Potable Water Supply - Storage	SW		1	12	WE8
141	28/39/M/0002	RIVER THAMES AT M2 LALEHAM INTAKE T14	Water Supply	Public Water Supply	Potable Water Supply - Storage	SW		1	12	WE8
142	28/39/M/0002	RIVER THAMES AT M2 STAINES INTAKE T11	Water Supply	Public Water Supply	Potable Water Supply - Storage	SW		1	12	WE8
145	TH/039/0027/002/R01	STOKE PARK BOREHOLE	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	Chalk	2	10	WE13
146	TH/039/0027/019	BOREHOLE AT AEROSERVE, 480 MALTON AVENUE	Industrial, Commercial And Public Services	Laundry	Laundry Use	GW	Chalk	4	3	WE13
147	TH/039/0027/020	WET PIT AT RIDING COURT FARM, WINDSOR	Industrial, Commercial And Public Services	Construction	General Use Relating To Secondary Category (Medium Loss)	GW	Chalk	4	3	WE13
148	TH/039/0027/020	WET PIT AT RIDING COURT FARM, WINDSOR	Industrial, Commercial And Public Services	Construction	Mineral Washing	GW	Chalk	4	3	WE13
149	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE A	Industrial, Commercial And Public Services	Transport	Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services	GW	Unspecified aquifer	1	12	WE12/WE13
150	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE A	Industrial, Commercial And Public Services	Transport	Evaporative Cooling	GW	Unspecified aquifer	1	12	WE12/WE13
151	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE A	Industrial, Commercial And Public Services	Transport	Evaporative Cooling	GW	Chalk	4	3	WE13
152	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE A	Industrial, Commercial And Public Services	Transport	General Use Relating To Secondary Category (High Loss)	GW	Unspecified aquifer	1	12	WE12/WE13
153	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE A	Industrial, Commercial And Public Services	Transport	General Use Relating To Secondary Category (High Loss)	GW	Chalk	4	3	WE13
154	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE B	Industrial, Commercial And Public Services	Transport	Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services	GW	Unspecified aquifer	1	12	WE12/WE13
155	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE B	Industrial, Commercial And Public Services	Transport	Evaporative Cooling	GW	Unspecified aquifer	1	12	WE12/WE13
156	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE B	Industrial, Commercial And Public Services	Transport	Evaporative Cooling	GW	Chalk	4	3	WE13
157	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE B	Industrial, Commercial And Public Services	Transport	General Use Relating To Secondary Category (High Loss)	GW	Unspecified aquifer	1	12	WE12/WE13
158	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE B	Industrial, Commercial And Public Services	Transport	General Use Relating To Secondary Category (High Loss)	GW	Chalk	4	3	WE13
159	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE C	Industrial, Commercial And Public Services	Transport	Evaporative Cooling	GW	Chalk	4	3	WE13
160	TH/039/0028/007	HEATHROW AIRPORT - BOREHOLE C	Industrial, Commercial And Public Services	Transport	General Use Relating To Secondary Category (High Loss)	GW	Chalk	4	3	WE13
161	TH/039/0028/010	KINGSMEAD QUARRY, HORTON, BERKSHIRE - WET PIT	Industrial, Commercial And Public Services	Extractive	Mineral Washing	GW	River Gravels	4	3	WE12
162	TH/039/0028/010	KINGSMEAD QUARRY, HORTON, BERKSHIRE - WET PIT	Industrial, Commercial And Public Services	Extractive	Process Water	GW	River Gravels	4	3	WE12
163	TH/039/0028/024	IVER GOLF COURSE, HOLLOW HILL LANE, IVER - BOREHOLE	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	Chalk	3	10	WE13
164	TH/039/0028/029	SLOUGH QUARRY, WEXHAM PARK LANE, WEXHAM, SLOUGH - BOREHOLE	Industrial, Commercial And Public Services	Extractive	Mineral Washing	GW	Chalk	4	3	WE13
165	TH/039/0028/040	RIVER COLNE - ABOVE A3113 AIRPORT WAY, STAINES	Environmental	Other Environmental Improvements	Transfer Between Sources (Pre Water Act 2003)	SW		4	3	WE4
166	TH/039/0031/001	CLOCKHOUSE LANE PIT- POINT 'A'	Industrial, Commercial And Public Services	Other Industrial/Commercial/Public Services	General Use Relating To Secondary Category (Medium Loss)	GW	River Gravels	4	3	WE12
167	TH/039/0031/007	POINT B, GRAVEL PIT AT LITTLETON LANE, SHEPPERTON, MIDDLESEX	Industrial, Commercial And Public Services	Mineral Products	General Use Relating To Secondary Category (Medium Loss)	GW	River Gravels	4	3	WE12
168	TH/039/0031/008	GRAVELS AT ASHFORD ROAD LALEHAM STAINES		Extractive	Mineral Washing	GW	River Gravels	4	3	WE12
169	TH/039/0031/013	WELL AT HAMPTON, MIDDLESEX	Agriculture	General Agriculture	Spray Irrigation - Direct	GW	River Gravels	4	10	WE12
170	TH/039/0031/016	BOREHOLE 'A' AT LONDON IRISH RUGBY CLUB, CROYSDALE AVENUE	Industrial, Commercial And Public Services	Sports Grounds/Facilities	Spray Irrigation - Storage	GW	River Gravels	3	11	WE12
171	TH/039/0036/003	STOCKLEY PARK, UXBRIDGE- BOREHOLE A	Industrial, Commercial And Public Services	Business Parks	Spray Irrigation - Direct	GW	Unspecified aquifer	4	10	WE12/WE13
172	TH/039/0036/003	STOCKLEY PARK, UXBRIDGE, BOREHOLE A	Industrial, Commercial And Public Services	Business Parks	Spray Irrigation - Storage	GW	Chalk	4	10	WE13
173	TH/039/0036/004	STOCKLEY PARK (PHASE 3)- BOREHOLE A	Industrial, Commercial And Public Services	Business Parks	Make-Up Or Top Up Water	GW	Chalk	4	3	WE13
174	TH/039/0036/004	STOCKLEY PARK (PHASE 3)- BOREHOLE A	Industrial, Commercial And Public Services	Business Parks	Spray Irrigation - Storage	GW	Chalk	4	3	WE13
175	TH/039/0036/004	STOCKLEY PARK (PHASE 3)- BOREHOLE A	Industrial, Commercial And Public Services	Business Parks	Spray Irrigation - Storage	GW	Unspecified aquifer	4	3	WE12/WE13
176	TH/039/0036/012	STOCKLEY PARK , UXBRIDGE (BOREHOLE)	Industrial, Commercial And Public Services	Golf Courses	General Washing/Process Washing	GW	Chalk	11	3	WE13
177	TH/039/0036/012	STOCKLEY PARK , UXBRIDGE (BOREHOLE)	Industrial, Commercial And Public Services	Golf Courses	Spray Irrigation - Direct	GW	Chalk	4	10	WE13
178	TH/039/0036/013	WESTERN INTERNATIONAL MARKET, HAYES ROAD, SOUTHALL, LONDON	Industrial, Commercial And Public Services	Business Parks	Evaporative Cooling	GW	Chalk	4	3	WE13
179	TH/039/0036/017	BOREHOLE AT PARK INN HOTEL, BATH ROAD	Industrial, Commercial And Public Services	Hotels, Public Houses And Conference Centres	General Use Relating To Secondary Category (Medium Loss)	GW	Chalk	4	3	WE13
180	TH/039/0037/004	DUKE OF NORTHUMBERLAND RIVER - MOGDEN SEWAGE TREATMENT WORKS	Water Supply	Water Supply Related	General Use Relating To Secondary Category (Low Loss)	SW		4	3	WE7
181	TH/039/0038/002	BOREHOLE AT EALING GOLF CLUB		Golf Courses	Spray Irrigation - Direct	GW	Unspecified aquifer	3	10	WE12/WE13
182	TH/039/0038/002	BOREHOLE AT EALING GOLF CLUB		Private Water Supply	Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household	GW	Chalk	4	3	WE13
184	TH/039/0038/006/R01	BOREHOLE AT WINDMILL LANE, SOUTHALL		Pump & Treat	Pollution Remediation	GW	River Gravels	4	3	WE12
185	TH/039/0038/012	NORTHALA FIELDS, NORTHOLT- BOREHOLE		Municipal Grounds	Make-Up Or Top Up Water	GW	Chalk	1	12	WE13
186	TH/039/0038/013	ST JOHN FISHER SCHOOL,SARSFIELD RD,LONDON,UB6-BOREHOLE		Schools And Colleges	Heat Pump	GW	Chalk	4	3	WE13
187	TH/039/0038/015	PITSHANGER ALLOTMENTS-BOREHOLE		Municipal Grounds	Horticultural Watering	GW	Chalk	4	3	WE13

Appendix 18.7
Discharges

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Discharge name	discharge type	Permit number	receiving water	Easting	Northing	Receptor group
2 STROUD FARM COTTAGES, STROUD FARM	Sewage - not water company	CTWC.1837	RIVER GRAVELS OVERLYINGLONDON	490150	177600	WE12
IVER SUB-STATION, CHANDLERS HILL, I	Sewage - not water company	CNTM.0778	ALDERBOURNE	504150	183620	WE10
NORTH WESTERN RESERVOIR, HEATHROW A	Trade	CTWC.3034	WRAYSBURY RIVER	504040	176300	WE3
OFFICE DEVELOPMENT ADJ. TO THE BUNG	Sewage - not water company	CTWC.0624	RIVER COLNE	504480	183310	WE4
TRAVELODGE T5	Trade	CANM.1277	TO RIVER WRAYSBURY	503536	175596	WE3
WEST DRAYTON COAL DEPOT, TAVISTOCK	Sewage - not water company	CNTM.0926	RIVER FRAYS	505700	180200	WE4
LONGBRIDGE	Sewage - not water company	CANM.1009	TO GROUNDWATER VIA SOAKAWAY	504559	183688	WE12
OFFICE OF STUDIO AT THE MILL	Sewage - not water company	NPSWQD008365	RIVER COLNE	504121	175177	WE4
COLNBROOK AGGREGATE DEPOT	Sewage - not water company	CANM.0731	BIGLEY DITCH-TRIB OF COLNE	504300	177680	WE3
ASPHALT PLANT	Miscellaneous	CTWC.2505	BIGLEY DITCH	505200	179400	WE3
ASPHALT PLANT	Miscellaneous	CTWC.2504	BIGLEY DITCH	505200	179400	WE3
ASPHALT PLANT	Sewage - not water company	CTWC.2504	BIGLEY DITCH	505200	179400	WE3
MOOR LANE SHAFT, STANWELL MOOR, MID	Trade	CNTS.0001	WRAYSBURY RIVER	503200	174700	WE3
THE WILLOWS	Sewage - not water company	NPSWQD001212	THE WRAYSBURY RIVER	502710	173000	WE3
AREA C LANDFILL	Trade	NPSWQD002559	RIVER WRAYSBURY	504195	177045	WE3
WEST DRAYTON COAL DEPOT, TAVISTOCK	Trade	CNTM.1002	RIVER FRAYS	505700	180200	WE4
BIGLEY KENNELS	Sewage - not water company	CANM.0260	BIGLEY DITCH	504990	178650	WE3
WARRENS WOODYARD, RIVERVIEW, THE CO	Sewage - not water company	CNTM.0403	WRAYSBURY RIVER	505220	178650	WE3
AREA 7/13 PROSPECT PARK, HARMONDSWO	Trade	CNTM.1471	RIVER COLNE	505400	178300	WE4
PHASE 300	Trade	CANM.0981	RIVER COLNE	504878	183894	WE4
THE LOCK HOUSE	Sewage - not water company	EPRBP3326GK	GRAND UNION CANAL	505245	184789	WE4
LOWER MILL FARM, STANWELL MOOR, SUR	Trade	CNTM.1180	RIVER COLNE	503550	174320	WE4
COLNBROOK LOGISTIC CENTRE	Trade	CANM.0455	OLD BIGLEY DITCH	504310	177430	WE3
SUFFOLK HOUSE	Sewage - not water company	CANM.0562	TO RIVER COLNE	504560	183530	WE4
COLNBROOK AGGREGATE DEPOT	Trade	CANM.0631	BIGLEY DITCH	504300	177680	WE3
RIVERSIDE CARAVAN PARK	Sewage - not water company	CANM.0991	TO RIVER COLNE	505283	179082	WE4
1 & 2 THE COTTAGES	Sewage - not water company	CTWC.3389	ALLUVIUM	504460	182270	WE12
SUFFOLK HOUSE, LONGBRIDGE, SLOUGH R	Sewage - not water company	CTCU.0907	GRAVEL STRATA	504500	183500	WE12
MOBILE HOME SITE, HIGHLAND VIEW, TH	Sewage - not water company	CNTM.0032	WRAYSBURY RIVER	505200	178400	WE3
BRAHMAJYOTI, THE LEA, WESTERN AVENU	Sewage - not water company	CTWC.0054	RIVER MISBOURNE	505100	186100	WE10
NIGHTINGALES LANE	Sewage - not water company	CANM.0661	INTO LAND AND UNNAMED DITCH	499550	195220	WE12
MARCH COTTAGE, MARISH LANE, DENHAM,	Sewage - not water company	CTWC.3597	GLACIAL GRAVELS.	502900	189200	WE12
COTTAGE 75	Sewage - not water company	CANM.0101	GRAND UNION CANAL	505190	193440	WE4
GREENKEEPERS CPD, BUCKINGHAMSHIRE G	Trade	CATM.2867	TRIBUTARY OFTHE RIVER COLNE	505000	186500	WE4
3A PENN WAY	Sewage - not water company	CANM.0418	INTO LAND	502700	195480	WE12
LOCKWELL HOUSE, WHITE HILL, NORTHWO	Sewage - not water company	CTCU.1316	GLACIAL GRAVEL STRATA	507100	191700	WE12
CHILTERN OPEN AIR MUSEUM	Sewage - not water company	CANM.1122	GROUNDWATER VIA VEGETATED SOAK	500891	193920	WE12
BREAKSPEAR ESTATE	Sewage - not water company	EPRYP3624GT	UN-NAMED TRIB OF RIVER COLNE	506433	189258	WE4
CLARE HOUSE COMPLEX, COPPERMILL LAN	Sewage - not water company	CATM.2403	RIVER COLNE(FLAKES CHANNEL)	504000	190870	WE4
LITTLE GREEN STREET FARM	Sewage - not water company	NPSWQD000334	GROUND WATERS VIA A SOAKAWAY	502425	197527	WE12
SPRINGWELL LANE	Sewage - not water company	CANM.0346	RIVER COLNE	504270	193020	WE4
NORTH ORBITAL ROAD, DENHAM, UXBRIDG	Trade	CTCU.0609	CHALK STRATA	504100	188700	WE13
RANK FILM LABORATORIES, DENHAM, UXB	Trade	CTCR.2040	COLNE	504300	188700	WE4
SPRINGWELL BARNS	Sewage - not water company	CANM.0141	RIVER COLNE CANALISED	504220	192720	WE4
SHOOTING CLUB, DUCKS HILL ROAD, NOR	Sewage - not water company	CTWC.2089	TRIB OF NEW YEARS GREEN BOURNE	507300	190100	WE4
STUBBS FARM	Sewage - not water company	EPRZP3727XF	INTO LAND	502362	197319	WE12
DURHAM HOUSE FARM	Sewage - not water company	CANM.1326	GROUNDWATER VIA SOAKAWAY	503452	185436	WE12
CUCKOO OAK, TILEHOUSE LANE, DENHAM,	Sewage - not water company	CNTW.0874	GLACIAL GRAVELS	503300	188400	WE12
BOURNE FARM COTTAGE	Sewage - not water company	NPSWQD007832	TRIB OF NEWYEARS GREEN BOURNE	506437	189717	WE4

BOURNE FARMHOUSE	Sewage - not water company	NPSWQD007834	NEWYEARS GREEN BOURNE	506575	189688	WE4
KNIGHTSCOTE FARM	Sewage - not water company	CATM.3362	TRIB OF NEW YEARS GREEN BOURNE	505930	190130	WE4
NO.S 1-4 COPPERMILL LOCK, CANALSIDE	Sewage - not water company	CNTM.0473	RIVER COLNE	504100	191500	WE4
HAREFIELD MARINA, MOORHALL ROAD, HA	Sewage - not water company	CTWC.3058	ALLUVIUM ANDMADE GROUND	505080	188670	WE12
AVIARY COTTAGE	Sewage - not water company	CANM.0462	LAND VIA BOREHOLE	501580	190200	WE12
HALES YARD	Sewage - not water company	CANM.0753	RIVER COLNE	504300	193060	WE4
REFRESHMENT HUT, MOOR PARK GOLF CLU	Sewage - not water company	CNTW.1361	GRAVELS ANDCLAY	507650	192800	WE12
BYWOOD, NIGHTINGALES LANE, CHALFONT	Sewage - not water company	CTCU.0062	CHALK STRATA	499900	195100	WE13
WOODCOCK HILL BARNS	Sewage - not water company	CANM.0256	WOODCOCK HILL STREAM	506390	191880	WE4
HOLLY TREE COTTAGE, NEW ROAD, LITTL	Sewage - not water company	CTCU.1948	UPPER CHALKSTRATA	500500	196600	WE13
GLENSCOT HOUSE	Sewage - not water company	CANM.0691	LAND VIA SOAKAWAY	501370	193040	WE12
1,3&4 FISHERY COTTAGES	Sewage - not water company	CANM.0493	RIVER COLNE	504010	190960	WE4
THE GATE HOUSE, POLLARDS PARK, NIGH	Sewage - not water company	CNTW.1184	UPPER CHALK	499370	195930	WE13
EASTER ROSS, 9 AMERSHAM ROAD, CHESH	Sewage - not water company	CNTM.0911	UPPER CHALK	495950	199250	WE13
THE PILLARS	Sewage - not water company	NPSWQD003567	GROUNDWATERS VIA SOAKAWAY	501990	189372	WE12
3 ACRES FARM	Sewage - not water company	CANM.0627	INTO LAND	506199	192472	WE12
ALDARN, NEW ROAD, CHALFONT ST. GILE	Sewage - not water company	CTWC.0926	UPPER CHALK	500500	196600	WE13
GARTH COTTAGE	Sewage - not water company	CANM.0556	TO LAND (UPPER CHALK)	499950	195610	WE13
LITTLE TILE HOUSE & TILE HOUSE CTTG	Sewage - not water company	NPSWQD007944	INTO LAND	499800	196100	WE12
SHEPHERDSHILL HOUSE	Sewage - not water company	CANM.0268	DITCH TRIB NEWYEARS GREEN BOUR	506190	190910	WE4
AN STP SERVING TROY HOUSE	Sewage - not water company	NPSWQD001433	THE RIVER COLNE TROY ARM LOOP	503677	190238	WE4
THE BARN	Sewage - not water company	CANM.0461	LAND VIA A BOREHOLE	501580	190200	WE12
DUMBELL PUBLIC HOUSE	Sewage - not water company	CANM.0334	LAND	501850	192500	WE12
9 FIELD ROAD	Sewage - not water company	CANM.0580	TO LAND (READING AND WOOLWICH)	503250	185960	WE12
THE COACH HOUSE	Sewage - not water company	CANM.0525	INTO LAND	499940	195720	WE12
STP SERVING STIVERS	Sewage - not water company	NPSWQD000896	GW VIA A BOREHOLE	499514	196079	WE12
LITTLE TILE HOUSE & TILE HOUSE CTTG	Sewage - not water company	NPSWQD007944	INTO LAND	499800	196100	WE12
ZELLY COTTAGE, BLACKSMITHS LANE, DE	Sewage - not water company	CNTM.0244	GRAVELS	502580	186680	WE12
REAR OF JARVA, RICKMANSWORTH LANE,	Sewage - not water company	CTCU.0618	CHALK STRATA	501100	192200	WE12
SPRINGWELL COTTAGE	Trade	CANM.0050	RIVER COLNE	504300	192700	WE4
RUSHILL FARM COTTAGE, HOLLYBUSH LAN	Sewage - not water company	CNTM.0223	LONDON CLAY	503060	185550	WE13
EAST & WEST COTTS, ROUGHWOOD LANE,	Sewage - not water company	CTCU.0426	CHALK STRATA	500400	195400	WE13
KINGCUP FARM, WILLETTS LANE, DENHAM	Sewage - not water company	CNTM.1223	RIVER GRAVELS	503700	185200	WE12
LEWGARS & LONGACRE, NIGHTINGALES LA	Sewage - not water company	CTWC.1704	PEBBLY CLAYSAND SANDS	500030	195360	WE12
DENHAM WATER SKI CLUB	Sewage - not water company	CATM.3624	THE RIVER COLNE	504020	189220	WE4
MIDDLE HALINGS HOUSE, HALINGS LANE,	Sewage - not water company	CTCU.1348	GLACIAL GRAVEL STRATA	503200	189300	WE12
FAIRACRE, DEADHEARN LANE, CHALFONT	Sewage - not water company	CTCU.0965	CHALK STRATA	500100	194100	WE13
STIVERS COTTAGE, POLLARDS PARK, NIG	Sewage - not water company	CNTM.1200	UPPER CHALK	499650	196200	WE13
BRAWLINGS FARMHOUSE	Sewage - not water company	NPSWQD009707	GROUNDWATER VIA A BOREHOLE	501196	192909	WE12
LOCKWELL HOUSE	Sewage - not water company	CANM.0678	UNKNOWN TRIB NEWYEARS GREEN BO	507250	191726	WE4
LOCKWELL HOUSE	Sewage - not water company	CANM.0131	NEWYEARS GREEN BOURNE TRIB	507410	191790	WE4
ROUGHWOOD LODGE, NIGHTINGALES LANE,	Sewage - not water company	CNTM.2128	GLACIAL CLAYS	499500	196500	WE12
MINERAL WORKINGS, HARVIL ROAD, HARE	Trade	CNTM.0832	NEW YEARS GREEN BOURNE	505500	187200	WE4
HILLVIEW, SHIRE LANE, HORN HILL, CH	Sewage - not water company	CNTW.0191	GLACIAL GRAVELS	501800	192700	WE12
OFFICES, HAREFIELD GROVE, HAREFIELD	Sewage - not water company	CANM.0397	WHITE HEATH STREAM	505810	191680	WE4
DENHAM QUARRY	Trade	EPRBB3030AU	INTO SETTLEMENT LAGOON	504190	184620	WE4
BALANCING RESERVOIR & PUMPING STN	Sewage - water company	CTCR.1214	TRIB OF COLNE	504300	184500	WE4
MAPLE LODGE STW, BUCKS	Sewage - water company	CANM.0034	RIVER COLNE	504120	192370	WE4
MAPLE LODGE STW, BUCKS	Sewage - water company	CNTD.0071	THE GUC (HAREFIELD REACH)	504200	191940	WE4
FACTORY PREMISES, BELL LANE, AMERSH	Sewage - not water company	CTCU.0074		498700	197800	WE4

THE MARBLE AND GRANITE CENTER LTD	Sewage - not water company	CATM.3643	TRIB OF RIVER COLNE	503620	190390	WE4
HOLLYBUSH FARMHOUSE	Sewage - not water company	CANM.1284	TO GROUND WATERS VIA SOAKAWAY	502300	186800	WE12
PROPERTIES AT RAANS FARM	Sewage - not water company	EPRBB3992WG	GROUNDWATER VIA BOREHOLE	498184	198429	WE12
UXBRIDGE SKIP HIRE, SKIP LANE, HARV	Trade	CNTM.1219	TILES DITCH	505950	187350	WE4
MOORHALL ROAD, HAREFIELD, MIDDLESEX	Sewage - not water company	CTWC.0180	HAREFIELD LAKE	504800	189200	WE4
NEW FLATS	Sewage - not water company	CANM.0105	RIVER COLNE	504320	193070	WE4
WOODCOCK HILL BARNS	Sewage - not water company	CANM.0256	WOODCOCK HILL STREAM	506390	191880	WE4
VEHICLE MAINTENANCE PLANT AT COLNBR	Trade	CTCU.1393	ALLUVIUM O/L GRAVEL OVR CLAY	503480	177220	WE12
106 COPPERMILL ROAD, WRAYSBURY, STA	Sewage - not water company	CTCU.1545	GRAVEL O/L LONDON CLAY STRATA	501960	174940	WE12
Iver North	Sewage - water company	TEMP.2693	Colne Brook	504400	180701	WE2
101 THORNEY MILL ROAD	Sewage - not water company	CANM.0505	THORNEY MILL RD LOOP (COLNE)	504870	179420	WE2
51 THORNEY MILL ROAD	Sewage - not water company	CANM.1101	UNKN DIT TRIB OF COLNE BROOK	504524	179525	WE2
HELLMAN HOUSE, LAKESIDE ROAD, COLNB	Trade	CNTM.0489	COLNE BROOK	503400	177300	WE2
COLNE INDUSTRIAL ESTATE, OLD BATH R	Sewage - not water company	CTCR.1989	CULVERTD SECT'N OF COUNTY DIT.	503700	176900	WE2
LAKESIDE INDUSTRIAL PARK, COLNBROOK	Trade	CNTM.0218	A POND TRIB OF THE COLNE BROOK	504210	178010	WE2
106 COPPERMILL ROAD, WRAYSBURY, STA	Sewage - not water company	CTCU.1546	GRAVEL O/L LONDON CLAY STRATA	501960	174950	WE12
WASTE TRANSFER STATION, ROSARY FARM	Trade	CNTM.1357	POYLE CHANNEL	503650	176460	WE2
NEW BUILDING, COURT LANE ESTATE, CO	Sewage - not water company	CTWC.0137	TAPLOW GRAVEL	504120	180420	WE12
THE CLUBHOUSE, THORNEY PARK GOLF CL	Sewage - not water company	CNTM.1118	COLNE BROOK	504800	179500	WE2
IVER RECYCLING LIMITED	Sewage - not water company	CANM.1186	TO GRAND UNION CANAL	504430	180596	WE4
LAKESIDE INDUSTRIAL PARK, COLNBROOK	Trade	CNTM.0218	A POND TRIB OF THE COLNE BROOK	504210	178010	WE2
WILLBAR COTTAGE	Sewage - not water company	CANM.0405	COLNE BROOK	504770	179340	WE2
99B THORNEY MILL ROAD	Sewage - not water company	CATM.3459	THE COLNE BROOK	504820	179390	WE2
ELK MEADOW	Sewage - not water company	CANM.1107	TO ALDER BOURNE	504029	182985	WE10
COLNBROOK LOGISTIC CENTRE	Trade	CANM.0453	CESS DRAIN OF THE COUNTY DITCH	503900	177210	WE2
IVER (NORTH) STW, IVER, BUCKS	Sewage - water company	CNTD.0079	THE COLNE BROOK	504390	180700	WE2
EIGHTEEN HOUSES, THORNEY FARM, THOR	Sewage - not water company	CATM.3069	COLNE BROOK	504800	179500	WE2
IVER TREATMENT WORKS, THORNEY LANE	Sewage and Trade combined	CNTM.0376	COLNE BROOK	504680	180110	WE2
IVER RECYCLING LIMITED	Trade	CANM.1186	TO GRAND UNION CANAL	504430	180596	WE4
COLNEBROOK AGGREGATE DEPOT	Trade	CANM.0628	TRIB COLNE BROOK	504320	177990	WE2
SQUARE GRIP FACTORY, LAKESIDE RD, L	Trade	CNTM.1302	ORLITT LAKE	503950	177600	WE12
106 COPPERMILL ROAD, WRAYSBURY, STA	Sewage - not water company	CTCU.1547	GRAVEL O/L LONDON CLAY STRATA	501950	174930	WE12
TANHOUSE FARM LANDFILL SITE AREA 22	Trade	CANM.0314	COLNBROOK	503500	177400	WE2
GEORGE LIONS (MERCHANTS) LIMITED	Sewage - not water company	CANM.1254	CULVERTED TRIB OF COUNTY DITCH	503764	176980	WE2
POYLE ROAD, COLNBROOK, BERKS	Miscellaneous	CTWC.0100	POYLE CHANNEL	503380	176460	WE2
89 AND 91 THORNEY MILL ROAD	Sewage - not water company	CANM.0155	TL LAND VIA SOAKAWAY	504750	179400	WE12
44 COPPERMILL ROAD, HORTON, BERKS	Sewage - not water company	CTCU.1698	GRAVEL O/L LONDON CLAY STRATA	502090	175310	WE12
DELAFORD PARK, IVER, BUCKS	Sewage - not water company	CTCU.1236	GRAVEL STRATA	504100	181400	WE12
160 COPPERMILL ROAD, WRAYSBURY, STA	Sewage - not water company	CTWC.2959	ALLUVIUM O/LL.CLAY	501800	174600	WE12
NO 113, THORNEY MILL ROAD, IVER, BU	Sewage - not water company	CNTM.0515	ALLUVIUM	504930	179400	WE12
32 COPPERMILL ROAD, WRAYSBURY, STAI	Sewage - not water company	CTCU.1425	GRAVEL OVERLYING LONDONCLAY	502100	175500	WE12
89 AND 91 THORNEY MILL ROAD	Sewage - not water company	CANM.0155	TL LAND VIA SOAKAWAY	504750	179400	WE12
BULLS BRIDGE CENTER	Miscellaneous	CANM.0043	INTO LAND	510660	179400	WE12
EASTERN RESERVOIR, HEATHROW AIRPORT	Trade	CTWC.3033	RIVER CRANE	510863	175227	WE7
NORTH HYDE SUBSTATION	Trade	CANM.0257	YEADING BROOK	510470	179080	WE7
NORTH EASTERN CATCHMENT, HEATHROW A	Trade	CTWC.3032	RIVER CRANE	510120	176190	WE7
DENE ESTATE SOCIAL CENTRE, CHERTSEY	Sewage - not water company	CNTM.0907	GRAVELS	514630	173500	WE12
SSO, Junction Crane Valley / Bath R	Sewage - water company	TEMP.2904	Crane	510000	177000	WE7
Anyand Park Road, Twickenham	Sewage - water company	TEMP.2369	Tidal Thames	516500	173900	WE14
SOUTH EASTERN CATCHMENT, HEATHROW A	Trade	CTWC.3031	RIVER CRANE	510360	175830	WE7

TYRE DEPOT, FELTHAM TYRE LTD, GREEN	Sewage - not water company	CNTM.0631	RIVER GRAVELS	510470	175170	WE12
WALL GARDEN FARM, SIPSON LANE, SIPS	Sewage - not water company	CTWC.2544	BRICKEARTH AND RIVER GRAVEL	507610	178050	WE12
THE WHITE HOUSE	Sewage - not water company	EPREB3898ES	GW VIA AN INFILTRATION SYSTEM	500111	176103	WE12
RIDING COURT FARM DEVELOPMENT, DATC	Sewage - not water company	CNTW.0921	FLOOD-PLAINGRAVEL	499050	177720	WE12
THAMES VALLEY WATER SKI CLUB	Sewage - not water company	CASM.2252	GROUNDWATER VIA A SOAKAWAY	500200	176020	WE12
PARSONAGE FARM	Sewage - not water company	CANM.0015	HORTON BROOK	501690	180510	WE1
IVER GOLF CLUB	Sewage - not water company	CANM.0608	DITCH TRIB HORTON BROOK	501810	180210	WE1
ALL SOULS FARM PIT, WEXHAM PARK LAN	Trade	CATM.2381	HORTON BROOK	499930	181500	WE1
BRITISH AIRWAYS SAILING CLUB, ARC G	Sewage - not water company	CASM.1152	GROUNDWATER VIA SOAKAWAY	501200	173200	WE12
TOTAL OIL GB LTD, LANGLEY TERMINAL,	Trade	CTCR.2044	HORTON BROOK	501700	180000	WE1
G E C (RADIO & TELEVISION) LTD	Sewage - not water company	CTCU.0706	GRAVEL STRATA	500700	181700	WE12
COLNBROOK SHAFT, OFF A4, COLNBROOK,	Trade	CNTS.0002	COLNBROOK	502700	177600	WE2
SITE OFFICE, ALL SOULS FARM, WEXHAM	Sewage - not water company	CNTW.0377	BOYN HILL TERRACE	499900	182200	WE12
KINGSMEAD QUARRY, WELLEY ROAD, HORT	Trade	CNTM.0377	A LAKE TRIBUTARY OF THEHORTON	501020	175100	WE2
ALL SOULS FARM PIT, WEXHAM PARK LAN	Trade	CATM.2381	HORTON BROOK	499930	181500	WE1
LOVE HILL HOUSE FARM, LOVE HILL LAN	Sewage - not water company	CTWC.1452	RIVER GRAVELS	501340	180880	WE12
LOVE HILL HOUSE, LOVE HILL LANE, SL	Sewage - not water company	CNTM.1271	TRIBUTARY OFTHE HORTONBROOK	501350	180860	WE1
GRANGE FARM	Sewage - not water company	NPSWQD003028	GROUND WATERS VIA A SOAKAWAY	503345	180700	WE12
CHERRY ORCHARD, TRENCHES LANE, WEXH	Sewage - not water company	CNTW.0770	RIVER BRICKEARTH	501500	180600	WE12
THE BUNGALOW, RAILWAY VIEW, DATCHET	Sewage - not water company	CTWC.0022	GRAVEL	500600	175900	WE12
6, BELLS LANE, HORTON, SLOUGH, BERK	Sewage - not water company	CTWC.0407	GRAVEL	501690	175770	WE12
5A BELLS LANE, HORTON, NR SLOUGH, B	Sewage - not water company	CTWC.0273	GRAVEL	501700	175760	WE12
1 RICHINGS WAY, IVER, BUCKS	Sewage - not water company	CTWC.2406	RIVER TERRACE GRAVELS	504020	179420	WE12
LAND ADJOINING PARK LODGE, PARK LAN	Sewage - not water company	CTCU.1754	LONDON CLAYSTRATA	501300	175800	WE13
MILDRIDGE FARMHOUSE, HORTON ROAD, H	Sewage - not water company	CTCU.1907	GRAVEL STRATA	501900	177100	WE12
8 RAILWAY VIEW, DATCHET ROAD, HORTO	Sewage - not water company	CTWC.0688	GRAVEL	500700	175900	WE12
BLACK PARK COUNTRY PARK	Sewage - not water company	NPSWQD007465	HORTON BROOK	500519	183126	WE1
LANGLEY PARK	Sewage - not water company	NPSWQD008709	TRIB OF RIVER THAMES	501619	182217	WE1
ROWLEY FARM COMPLEX, BLACKPARK ROAD	Sewage and Trade combined	CTCR.2086	HORTON BROOK	500420	182880	WE1
HEATH LODGE, WOOD LANE, IVER, BUCKI	Sewage - not water company	CNTW.0073	UN-NAMED TRIB OF HORTON BROOK	502280	181530	WE1
IVER FLOWERLAND PRODUCTION NURSERY	Agriculture	CANG.0098	LAND	502850	181980	WE12
WOOD LANE FARM, WOOD LANE, IVER, BU	Sewage - not water company	CNTM.1168	GRAVELS	502200	181800	WE12
HOLLYDENE, FULMER COMMON, IVER, BUC	Sewage - not water company	CNTM.2067	TRIBUTARY OFTHE ALDERBOURNE	501360	184950	WE10
TEMPLE GRANGE, BILLET LANE, IVER, B	Sewage - not water company	CNTM.1052	ROUGHGROUNDWOOD STREAM	501610	182440	WE1
WOODLANDS STABLES	Sewage - not water company	CANM.0701	GROUNDWATER VIA SOAKAWAY	501970	181600	WE12
LANTERN LODGE, LOVE GREEN LANE, IVE	Sewage - not water company	CTWC.0183	TRIBUTARY OFCOLNE BROOK	503200	181800	WE2
HIGHFIELD HOUSE & EXTENSION, BILLET	Sewage - not water company	CNTM.0862	GRAVELS	501690	182190	WE12
ORCHARD VIEW	Sewage - not water company	CANM.1221	DIT TRIB HORTON BR VIA PERF PI	501895	181695	WE1
CALVES LANE FARMHOUSE, BEWSWOOD LAN	Sewage - not water company	CNTM.1727	GRAVELS	501700	181650	WE12
GOONEVEAN	Sewage - not water company	CANM.1338	GROUNDWATER VIA SOAKAWAY	502124	182061	WE12
BRYNAWELON FARM, SWALLOW STREET, IV	Sewage - not water company	CTWC.1431	GLACIAL SAND & GRAV INTO LAND	502830	181580	WE12
ST CATHERINES HOUSE,WOOD LANE,IVER,	Sewage - not water company	CTWC.1752	UNNAMED TRIB OF HORTON BROOK	502400	181700	WE1
PINEWOOD STUDIOS INTERCEPTOR	Sewage - not water company	EPRWP3129GG	HORTON BROOK	501479	184114	WE1
SHREDDING GREEN FARM	Agriculture	CANG.0037	LAND	502740	181010	WE12
M4 MAINTENANCE COMPOUND J3 EAST	Sewage - not water company	CATM.2485	GRAVELS	512421	177891	WE12
WYEVALE GARDEN CITY	Sewage - not water company	CANM.1354	GROUNDWATER VIA SOAKAWAY	515466	178120	WE12
NEW LODGE, LION GATE, SYON PARK, BR	Sewage - not water company	CTCU.1933	GRAVEL STRATA	516780	176970	WE12
WILDERNESS LODGE, SYON PARK, BRENTF	Sewage - not water company	CNTW.1084	RIVER GRAVEL	516980	176300	WE12
BERRITE INDUSTRIAL ESTATE, IRONBRID	Sewage and Trade combined	CTWC.0957	GRAND UNIONCANAL	507200	180000	WE10
THE BERRITE ESTATE, IRON BRIDGE ROA	Miscellaneous	CTWC.1112	GRAND UNIONCANAL	507300	179900	WE10

WEST DRAYTON DEPOT, STOCKLEY ROAD,	Trade	CNTM.1020	GRAND UNIONCANAL	507800	179900	WE10
THE BARGE STUDIO	Sewage - not water company	CANM.0837	GROUNDWATER VIA SOAKAWAY	505216	181423	WE12
UBS AG	Trade	NPSWQD003883	GRAND UNION CANAL	509311	179860	WE10
SWOT PUMPING STATION	Trade	CNTM.1243	CLOCKHOUSE LANE PIT	507690	172970	WE12
ASHFORD COMMON TREATMENT WORKS, ASH	Trade	CNTM.1472	RIVER ASH	508688	170136	WE4
KEMPTON WATER WORKS, COUNTRY WAY, S	Trade	CATM.2937	PORTLANE BROOK	511000	171200	WE6
5, 8, 9, 10, 11, & 12, THE SMALLHOL	Sewage - not water company	CNTM.0731	RIVER GRAVELS ON LONDONCLAY	507900	171940	WE12
LORRY & CAR PARK AREA, UNIGATE DAIR	Trade	CNTW.1142	PORTLANE BROOK	511060	171250	WE6
Charlton Lane	Sewage - water company	TEMP.0636	Thames	508000	169500	WE8
7 CLOCKHOUSE LANE	Sewage - not water company	CANM.1003	INTO LAND	507937	172078	WE12
SWOT PUMPING STATION	Trade	CANM.0614	CLOCKHOUSE LANE PIT	507700	172950	WE12
WALTON WATER WORKS	Trade	CNTS.0008	INLET CHANNEL OF RESERVOIRS	511500	169730	WE11
WEST LONDON TERMINAL, BEDFONT ROAD,	Trade	CNTM.1360	CLOCKHOUSE LANE PIT	507200	172700	WE12
KINGDOM HALL	Sewage - not water company	CNTM.0851	GRAVELS ON LONDON CLAY	511920	171770	WE12
CLOCKHOUSE SERVICE STATION	Sewage - not water company	CANM.0980	INTO LAND	507984	173319	WE12
S OF STAINES RD, W OF CLOCKHOUSE LN	Sewage - not water company	NPSWQD000939	GW VIA A SOAKAWAY	507697	173171	WE12
NO.624 STAINES ROAD, BEDFONT, MIDDL	Sewage - not water company	CNTM.0363	RIVER GRAVELS	507910	173350	WE12
GRAVEL PIT, NEW ROAD, LITTLETON, SU	Sewage - not water company	CTWC.3377	RIVER ASH	507700	168500	WE4
THOMPSON'S PLANT & GARDEN CENTRE	Sewage and Trade combined	CASM.0046	A TRIBUTARY OF THE RIVER ASH	508100	168500	WE4
SHEPPERTON STUDIOS, SHEPPERTON, MID	Miscellaneous	CTWC.0471	RIVER ASH	506880	168420	WE4
FORMER ICL, BEAUMONT	Miscellaneous	CTCR.1594	TRIB OF THAMES	499300	173400	WE8
1-4 BOVENEY COURT FARM & 1-2 BOV.	Sewage - not water company	CASM.2343	GROUNDWATER VIA A SOAKAWAY	493530	177710	WE12
ETON COLLEGE, ETON, WINDSOR, BERKS	Sewage - not water company	CTCU.1960	FLOOD PLAINGRAVEL STRATA	496850	177980	WE12
1A DOUGLAS LANE, WRAYSBURY, STAINES	Sewage - not water company	CTWC.0881	GRAVEL	500750	174360	WE12
WINDSOR MARINA	Trade	CASM.0509	RIVER THAMES	493130	177300	WE8
ETON COLLEGE BOATING LAKE	Sewage and Trade combined	CASM.0066	RIVER THAMES	493780	177370	WE8
QUEENSHEAD FILLING STATION, A308, W	Sewage - not water company	CTWC.0697	TAPLOW GRAVELS	491570	177720	WE12
WINDSOR WATERWORKS, ROMNEY LANE, WI	Trade	CATM.2940	WINDSOR PUMPRACE	497000	177900	WE8
ANDREWS BOATHOUSE	Sewage - not water company	EPRPB3336AZ	THE RIVER THAMES	493871	177401	WE8
Eton, Pressure Filter Backwash	Trade	TEMP.3052	Corporation Stream (trib. of T	496800	177700	WE8
PROPERTY ADJ TO MAGPIE COTTAGE	Sewage - not water company	CATM.3697	RIVER THAMES	499600	173300	WE8
17 STAINES ROAD, WRAYSBURY, STAINES	Sewage - not water company	CTCU.1930	GRAVEL STRATA	500400	173800	WE12
EMERGENCY DISCHARGE, EGHAM WATER WO	Trade	CNTW.0121	RIVER THAMES	502100	171800	WE8
EMERGENCY DISCHARGE, EGHAM WATER WO	Trade	CATM.2540	RIVER THAMES	502400	171800	WE8
GREEN GABLES	Sewage - not water company	CATM.3669	RIVER THAMES	492000	177900	WE8
1A DOUGLAS LANE, WRAYSBURY, STAINES	Sewage - not water company	CTWC.0880	GRAVEL	500750	174340	WE12
WRAYSBURY VILLAGE HALL, THE GREEN,	Sewage - not water company	CTCU.1135	GRAVEL STRATA	500400	174200	WE12
NEW BOWRY HOUSING SITE, STATION ROA	Sewage - not water company	CTCU.0729	GRAVEL STRATA	500800	174300	WE12
EGHAM WATER WORKS, THE CAUSEWAY, ST	Trade	CATM.3042	RIVER THAMES	502250	171800	WE8
PHOENIX GYMNASTIC CLUB, UNIT ONE WA	Sewage - not water company	CATM.2321	THAMES GRAVELS	491950	177800	WE12
DATCHET WATER TREATMENT WORKS, POCO	Trade	CNTM.1739	MYRKE DITCH	497640	178130	WE8
WINDSOR STW, HAM ISLAND, OLD WINDSO	Sewage - water company	CNTD.0055	RIVER THAMES	499640	175000	WE8
MUNICIPAL CAR PARK, BARRY AVENUE, W	Miscellaneous	CTWC.1583	RIVER THAMES	496250	177300	WE8
EGHAM WATER WORKS, THE CAUSEWAY, ST	Trade	CNTW.0106	RIVER THAMES	502250	171800	WE8
Windsor	Sewage - water company	TEMP.3014	Thames	499700	175001	WE8
ROMNEY LOCK	Sewage - not water company	CASM.1382	INTO LAND	496950	177760	WE12
THE MAYS, GARSON LANE, WRAYSBURY, S	Sewage - not water company	CTWC.1152	FLOOD PLAINGRAVELS	499900	173860	WE12
BOVENEY LOCK HOUSE & MESS-ROOM, BOV	Sewage - not water company	CSSM.0038	RIVER THAMES	494550	177750	WE8
26, OUSELEY RD, WRAYSBURY, STAINES,	Sewage - not water company	CTWC.1053	FLOOD PLAINGRAVELS	499800	173900	WE12
2 FRIARY ISLAND, WRAYSBURY, STAINES	Sewage - not water company	CNTW.0529	RIVER THAMES	499200	173900	WE8

PLOT 3, FAIRFIELD APPROACH, WRAYSBU	Sewage - not water company	CNTM.1908	GRAVELS	499950	174280	WE12
WILLOW POINT	Sewage - not water company	NPSWQD004580	TRIBUTARY OF RIVER THAMES	499212	173886	WE8
AKLAN, HILLVIEW ROAD, WRAYSBURY, ST	Sewage - not water company	CTWC.0286	GRAVEL	499870	174440	WE12
SPINNEYSIDE, MEDE CLOSE, OFF MAGNA	Sewage - not water company	CTWC.0902	GRAVEL	499950	173200	WE12
RIVER JOY, DOWN PLACE, WINDSOR ROAD	Sewage - not water company	CATM.2482	TERRACE GRAVELS	492300	177700	WE12
SEKOS, FRIARY ISLAND, WRAYSBURY, ST	Sewage - not water company	CTWC.2610	RIVER THAMES	499200	173700	WE8
PLOT 2, 74, WELLEY ROAD, WRAYSBURY,	Sewage - not water company	CTWC.2371	RIVER GRAVELS OVR LONDON CLAY	500050	174650	WE12
LINDEN LEE, 7 BOWRY DRIVE, WRAYSBUR	Sewage - not water company	CTWC.1913	RIVER GRAVELS OVERLYINGLONDON	500890	174240	WE12
NO. 28 FRIARY ROAD, WRAYSBURY, STAI	Sewage - not water company	CATM.2302	THAMES GRAVELS	499300	174100	WE12
BUNGALOW ADJ. TO THE MAYS, GARSON L	Sewage - not water company	CTWC.1093	FLOOD PLAINGRAVEL	499900	173850	WE12
PLOT ADJOINING ROSTELLA, FAIRFIELD	Sewage - not water company	CTWC.1150	RIVER GRAVELS	499960	174310	WE12
4 WHARF ROAD, WRAYSBURY, STAINES, M	Sewage - not water company	CTWC.0700	GRAVEL	499640	173880	WE12
47 THE AVENUE, SUNYMEADS, WRAYSBURY	Sewage - not water company	CTWC.2533	RIVER THAMES	499920	175550	WE8
LA DIGUE, 3 BOWRY DRIVE, WRAYSBURY,	Sewage - not water company	CTWC.1519	FLOOD PLAIN GRAVS O/L LAND	500850	174200	WE12
PLOT ADJ. TO LITTLE ORCHARD, HILL V	Sewage - not water company	CNTM.0594	GRAVELS	499850	174470	WE12
PLOT ADJ. TO WILLOWMERE, HILL VIEW	Sewage - not water company	CNTM.0593	GRAVELS	499850	174480	WE12
129 WELLEY ROAD, WRAYSBURY, STAINES	Sewage - not water company	CTCU.1424	GRAVEL DISCHARGE	500000	175300	WE12
ADJ. TO THE GREEN MAN, STATION RD,	Sewage - not water company	CTCU.1506	GRAVEL STRATA	500950	174300	WE12
31 WELLEY ROAD, WRAYSBURY, STAINES,	Sewage - not water company	CTWC.0723	GRAVEL	500000	174300	WE12
42 FRIARY ROAD, WRAYSBURY, STAINES,	Sewage - not water company	CNTW.0259	FLOOD PLAINGRAVEL	499300	173950	WE12
4 THE EMBANKMENT, WRAYSBURY, STAINE	Sewage - not water company	CTWC.1585	RIVER THAMES	499400	173400	WE8
NORTH LODGE, 2 THE DRIVE/97 WELLEY	Sewage - not water company	CTCU.0962	GRAVEL STRATA	499900	174800	WE12
6 BOWRY DRIVE, WRAYSBURY, STAINES,	Sewage - not water company	CTWC.1623	RIVER GRAVELS OVERLYINGLONDON	500850	174210	WE12
NEW VICARAGE BY 57 WELLEY ROAD, WRA	Sewage - not water company	CNTM.1509	GRAVELS	500010	174500	WE12
VILLA SHIREEN, SOUTHLEA ROAD, DATCH	Sewage - not water company	CTCR.1811	THAMES	498600	176400	WE8
DINGLEY DELL COTTAGE, FRIARY ISLAND	Sewage - not water company	CATM.2546	THAMES ALLUVIUM	499300	174300	WE12
BOWRY DRIVE, WRAYSBURY, STAINES, MI	Sewage - not water company	CTWC.1817	RIVER GRAVELS OVERLYINGLONDON	500920	174240	WE12
THE SWAN SANCTUARY, CUCKOO WEIR ISL	Sewage - not water company	CATM.3003	BACK WATER OF THE RIVERTHAMES	495800	177500	WE8
BOVENEY LOCK	Sewage - not water company	CASM.1340	GROUNDWATER VIA A SOAKAWAY	494440	177730	WE12
ANKERWYCKE FARMHOUSE	Sewage - not water company	NPSWQD007116	THE RIVER THAMES	500549	173244	WE8
1 & 2 ANKERWYCKE FM, COTTS, MAGNA C	Sewage - not water company	CNTM.1159	HORTON BROOK	500560	173250	WE1
FARM WORKERS HOSTEL, WATER OAKLEY F	Sewage - not water company	CTCU.0811	GRAVEL STRATA	491900	177800	WE12
LONGACRE	Sewage - not water company	CASM.0456	THE RIVER THAMES	490270	180650	WE8
SPRING COTTAGE, CLIVEDEN ESTATE, TA	Sewage - not water company	CATM.3198	RIVER THAMES	490870	184490	WE8
BRAYWOOD HOUSE, DRIFT ROAD, WINDSOR	Sewage - not water company	CNTM.0781	TRIB OF OAKLEY GREEN STREAM	491500	175500	WE8
BRAY LOCK HOUSE, BRAY LOCK, NEAR MA	Sewage - not water company	CSSM.0034	RIVER THAMES	491000	179800	WE8
THE TARBAY CENTRE	Sewage - not water company	CASM.2622	UNNAMED DITCH	492899	175564	WE8
PRINCESS MARGARET HOSPITAL, OSBOURN	Miscellaneous	CNTW.0194	BOURNE DITCH	496500	175700	WE8
ENGLEFIELD PARK	Sewage - not water company	CASM.0577	TRIBUTARY OF THE RIVER THAMES	499970	171690	WE8
THE RED HOUSE	Sewage - not water company	CASM.0578	THE RIVER THAMES	490180	180590	WE8
MILL LODGE (FORMERLY FORMOSA LODGE)	Sewage - not water company	CASM.0201	LULLE BROOK	490280	185040	WE8
NEW LODGE, DRIFT ROAD, WINKFIELD, B	Sewage - not water company	CNTM.1898	TRIB OF THE CHAWRIDGE BOURNE	491200	175000	WE8
GALE BUNGALOW	Sewage - not water company	NPSWQD008382	TRIBUTARY OF THE RIVER THAMES	492956	175951	WE8
THE OLD ORCHARD (EX HERGESWIL)	Sewage - not water company	CASM.0412	TRIB. OF THE STROUD FARM DITCH	490400	176560	WE8
GREY FLINTS	Sewage - not water company	CASM.0958	TRIBOF THE OAKLEY GREEN STREAM	491620	175520	WE8
TARBAY WOODS HOUSE	Sewage - not water company	EPREB3899NZ	RIVER THAMES	492952	175734	WE8
HOME FARM, DRIFT ROAD, WINKFIELD, B	Sewage - not water company	CNTM.1720	TRIB OF OAKLEY GREEN STREAM	492070	174360	WE8
BARGEFIELD HOUSE, BARGE FARM, AMERD	Sewage - not water company	CATM.2768	AMERDEN DITCH	490500	180300	WE8
KIMBERS LANE FARM, OAKLEY GREEN ROA	Sewage - not water company	CTWC.1252	TRIB OF OAKLEY GREEN STREAM	492150	176350	WE8
THE MEWS, SALWEY HSE, JEBB HSE, RU.	Sewage - not water company	CATM.3668	RUNNYMEDE PARK POND INTO THAMS	500500	171500	WE8

LAKESIDE FARM, FIFIELD LANE, WINKFI	Sewage - not water company	CATM.3127	TRIB OF THE OAKLEYGREEN STREAM	491070	175490	WE8
Lower Cookham Rd Car Park	Sewage - water company	TEMP.1396	Thames	490300	182500	WE8
FERRY COTTAGE & NEW COTTAGE, CLIVED	Sewage - not water company	CNTW.0458	RIVER THAMES	490900	184900	WE8
SUNBURY GOLF CLUB, CHARLTON LANE, S	Sewage - not water company	CNTM.0521	GRAVELS	508550	168300	WE12
STW, HOME PARK GOLF CLUB, HAMPTON W	Sewage - not water company	CTCR.1591	HAMPTON COURT DITCH	516900	167500	WE8
WALTON WATER WORKS	Trade	CNTW.0160	INTAKE CHANNEL FROM R. THAMES	511700	168480	WE11
SURREY ECO PARK	Trade	EPREB3396NY	UNNAMED TRIB OF RIVER ASH	508564	168396	WE4
SECONDARY FILTER BOTTOM DRAIN, HURS	Trade	CNTW.0188	INTAKE CHANNEL FROM R. THAMES	511720	168430	WE11
BP OIL TERMINAL, SUNBURY LANE, WALT	Trade	CATM.3199		510400	167600	WE8
WALTON WATER WORKS	Trade	CNTW.0172	INTAKE CHANNEL FROM R. THAMES	511730	168420	WE11
OUTLET D, (CONTACT TANKS SCREEN WAS	Trade	CNTW.0189	INTAKE CHANNEL FROM R. THAMES	511660	168550	WE11
TOAD HALL & BASCOBEL	Sewage - not water company	EPRAB3292RF	RIVER THAMES	504255	169521	WE8
STAINES LANE, CHERTSEY, SURREY, KT1	Trade	CTCR.1620	GRAVL PIT CONNECT'G WTH THAMES	503950	169100	WE12
WALTON WATER WORKS	Trade	EPRDB3495EF	WALTON WATER INTAKE CHANNEL	511700	168470	WE11
Hampton, Filterwash	Trade	TEMP.3060	River Thames	513400	169401	WE8
SURREY ECO PARK	Trade	EPREB3396NY	UNNAMED TRIB OF RIVER ASH	508440	168735	WE4
THAMES STREET / HIGH STREET, STAINE	Miscellaneous	CTWC.0760	RIVER THAMES	503500	171400	WE8
BP OIL UK LTD	Trade	CASM.1471	GROUNDWATER VIA A SOAKAWAY	510940	168290	WE12
WALTON WATER WORKS	Trade	EPRDB3495EF	WALTON WATER INTAKE CHANNEL	511610	168640	WE11
CLAR INNIS, RIVERSIDE, TEMPLE GARDE	Sewage - not water company	CATM.2616	RIVER THAMES	504300	169500	WE8
PENTON HOOK	Sewage - not water company	CASM.1381	INTO LAND	504390	169550	WE12
SUNBURY LOCK HOUSE	Sewage - not water company	CASM.1383	INTO GROUND	510990	168540	WE12
ISLAND END, LALEHAM REACH, CHERTSEY	Sewage - not water company	CTCU.1478	GRAVEL O/L LONDON CLAY STRATA	504320	168990	WE12
AVOCA, LALEHAM REACH, CHERTSEY, SUR	Sewage - not water company	CTCU.0423		504800	169300	WE8
REPLACEMENT DWELLING, ROSE COTTAGE,	Sewage - not water company	CNTM.2141	GRAVELS	517300	169200	WE12
WALTON WATER WORKS	Miscellaneous	CNTW.0096	R. THAMES (DESBOROUGH CHANNEL)	508720	166110	WE8
SANDWASHER PUMPING STATION, WALTON	Miscellaneous	CNTW.0143	R. THAMES (DESBOROUGH CHANNEL)	508380	166040	WE8
SECONDARY FILTERS, WALTON WATER WOR	Trade	CNTW.0139	R. THAMES (DESBOROUGH CHANNEL)	508380	166040	WE8
WALTON WATER WORKS	Trade	CNTW.0096	R. THAMES (DESBOROUGH CHANNEL)	508720	166110	WE8
HAMPTON COURT GOLF CLUB	Sewage - not water company	EPRCB3191NU	RIVER THAMES	517215	167544	WE8
SHEPPERTON GRAVEL PIT, LITTLETON LA	Trade	CNTM.2074	RIVER THAMES	505470	166720	WE8
SUNBURY DEPOT	Sewage - not water company	EPRSB3999NU	RIVER THAMES	510286	167893	WE8
FORMER KINGSTON POWER STATION	Trade	EPRUP3728GE	RIVER THAMES	517774	169672	WE8
VINTAGE INN	Sewage and Trade combined	CATM.3698	RIVER THAMES	505450	166640	WE8
RYE MEAD HOUSE, LOWER HAMPTON ROAD,	Sewage - not water company	CATM.3056	RIVER THAMES	512380	169050	WE8
PARKFIELD, BARGE WALK, HAMPTON WICK	Sewage - not water company	CTWC.3267	RIVER THAMES	517750	168610	WE8
33 THAMES MEADOW, SHEPPERTON, MIDDL	Sewage - not water company	CTWC.1201	RIVER THAMES	509000	166100	WE8
NO 1 - 4 PENNY MOORINGS, RIVERSIDE,	Sewage - not water company	CNTM.0787	RIVER THAMES	509430	166720	WE8
BUDE HAVEN	Sewage - not water company	NPSWQD008488	RIVER THAMES	509508	166695	WE8
THE LODGE	Sewage - not water company	CASM.0723	THE RIVER THAMES	517680	168620	WE8
LYNDHURST	Sewage - not water company	EPRLP3729GK	RIVER THAMES	512307	169080	WE8
WATERSIDE	Sewage - not water company	CASM.0197	RIVER THAMES	510180	167620	WE8
PAX	Sewage - not water company	CANM.1067	TO THE RIVER THAMES	509400	166700	WE8
DESIGN EQUIPTY,UNIT 19,PLATTS EYOT,	Sewage - not water company	CATM.3268	RIVER THAMES	513600	169200	WE8
WATERSIDE	Sewage - not water company	CASM.0097	RIVER THAMES	510180	167620	WE8
HAMBLEDEN, THE MEADS, CHERTSEY, SUR	Sewage - not water company	CTCR.2165	THAMES	505600	166300	WE8
SITE NEXT TO RYEPECK STABLES, CHERT	Sewage - not water company	CTWC.3483	RIVER THAMES	506200	166700	WE8
RANGE COTTAGE	Sewage - not water company	CANM.0681	RIVER THAMES	506480	166490	WE8
FORMER FERRY HOUSE	Sewage - not water company	CASM.1234	BURWAY DITCH	504870	168500	WE8
HAMPTON WTW, LOWER SUNBURY ROAD	Trade	CATS.0040	RIVER THAMES	513600	169300	WE8

SUNNYSIDE RESERVOIR, HAMPTON WATER	Trade	CNTW.0276	RIVER THAMES	512840	168930	WE8
WALTON WATER WORKS	Trade	CNTW.0161	RIVER THAMES	511500	168800	WE8
Kingston Main	Sewage - water company	TEMP.1273	Thames	517800	169601	WE8
Portsmouth Road, Uxbridge Road	Sewage - water company	TEMP.2843	Thames	517700	168000	WE8
LAFARGE READYMIX EGHAM	Trade	CASM.2736	GROUND WATERS VIA A SOAKAWAY	502053	169592	WE12

Appendix 1.2
EIA Scoping Opinion

The Planning Inspectorate
Yr Arolygiaeth Gynllunio

SCOPING OPINION:

Proposed Expansion of Heathrow Airport (Third Runway)

Case Reference: TR020003

Adopted by the Planning Inspectorate (on behalf of the Secretary of State for Housing, Communities and Local Government) pursuant to Regulation 10 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

June 2018

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1. INTRODUCTION

1.1 Background

1.1.1 On 21 May 2018, the Planning Inspectorate (the Inspectorate) on behalf of the Secretary of State (SoS) received a scoping request from Heathrow Airport Limited (the Applicant) under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) for the proposed Expansion of Heathrow Airport (Third Runway) (the Proposed Development).

1.1.2 In accordance with Regulation 10 of the EIA Regulations, an Applicant may ask the SoS to state in writing its opinion '*as to the scope, and level of detail, of the information to be provided in the environmental statement'.*

1.1.3 This document is the Scoping Opinion (the Opinion) provided by the Inspectorate on behalf of the SoS in respect of the Proposed Development. It is made on the basis of the information provided in the Applicant's report entitled 'Airport Expansion EIA Scoping Report' (the Scoping Report), which was provided in three volumes (main text, figures and appendices). This Opinion can only reflect the proposals as currently described by the Applicant. The Scoping Opinion should be read in conjunction with the Applicant's Scoping Report.

1.1.4 The Applicant has notified the SoS under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an Environmental Statement (ES) in respect of the Proposed Development. Therefore, in accordance with Regulation 6(2)(a) of the EIA Regulations, the Proposed Development is EIA development.

1.1.5 Regulation 10(9) of the EIA Regulations requires that before adopting a Scoping Opinion the Inspectorate must take into account:

(a) any information provided about the proposed development;

(b) the specific characteristics of the development;

(c) the likely significant effects of the development on the environment; and

(d) in the case of a subsequent application, the environmental statement submitted with the original application.

1.1.6 This Opinion has taken into account the requirements of the EIA Regulations as well as current best practice towards preparation of an ES.

1.1.7 The Inspectorate has consulted on the Applicant's Scoping Report and the responses received from the consultation bodies have been taken into account in adopting this Opinion (see Appendix 2).

1.1.8 The points addressed by the Applicant in the Scoping Report have been carefully considered and use has been made of professional judgement

and experience in order to adopt this Opinion. It should be noted that when it comes to consider the ES, the Inspectorate will take account of relevant legislation and guidelines. The Inspectorate will not be precluded from requiring additional information if it is considered necessary in connection with the ES submitted with the application for a Development Consent Order (DCO).

1.1.9 This Opinion should not be construed as implying that the Inspectorate agrees with the information or comments provided by the Applicant in its request for an opinion from the Inspectorate. In particular, comments from the Inspectorate in this Opinion are without prejudice to any later decisions taken (eg on submission of the application) that any development identified by the Applicant is necessarily to be treated as part of a Nationally Significant Infrastructure Project (NSIP) or Associated Development or development that does not require development consent.

1.1.10 Regulation 10(3) of the EIA Regulations states that a request for a scoping opinion must include:

(a) a plan sufficient to identify the land;

(b) a description of the proposed development, including its location and technical capacity;

(c) an explanation of the likely significant effects of the development on the environment; and

(d) such other information or representations as the person making the request may wish to provide or make.

1.1.11 The Inspectorate considers that this has been provided in the Applicant's Scoping Report. The Inspectorate is satisfied that the Scoping Report encompasses the relevant aspects identified in the EIA Regulations.

1.1.12 In accordance with Regulation 14(3)(a), where a scoping opinion has been issued in accordance with Regulation 10 an ES accompanying an application for an order granting development consent should be based on 'the most recent scoping opinion adopted (so far as the proposed development remains materially the same as the proposed development which was subject to that opinion)'.

1.1.13 Inspectorate notes the potential need to carry out an assessment under The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations). This assessment must be co-ordinated with the EIA in accordance with Regulation 26 of the EIA Regulations. The Applicant's ES should therefore be co-ordinated with any assessment made under the Habitats Regulations.

1.2 The Planning Inspectorate's Consultation

1.2.1 In accordance with Regulation 10(6) of the EIA Regulations the Inspectorate has consulted the consultation bodies before adopting this Scoping Opinion. A list of the consultation bodies formally consulted by

the Inspectorate is provided at Appendix 1. The consultation bodies have been notified under Regulation 11(1)(a) of the duty imposed on them by Regulation 11(3) of the EIA Regulations to make information available to the Applicant relevant to the preparation of the ES. The Applicant should note that whilst the list can inform its consultation, it should not be relied upon for that purpose.

1.2.2 The list of respondents who replied within the statutory timeframe and whose comments have been taken into account in the preparation of this Opinion is provided, along with copies of their comments, at Appendix 2, to which the Applicant should refer in preparing its ES.

1.2.3 The ES submitted by the Applicant should demonstrate consideration of the points raised by the consultation bodies. It is recommended that a table is provided in the ES summarising the scoping responses from the consultation bodies and how they are, or are not, addressed in the ES.

1.2.4 Any consultation responses received after the statutory deadline for receipt of comments will not be taken into account within this Opinion. Late responses will be forwarded to the Applicant and will be made available on the Inspectorate's website. The Applicant should also give due consideration to those comments in preparing its ES.

1.3 Article 50 of the Treaty on European Union

1.3.1 On 23 June 2016, the United Kingdom (UK) held a referendum and voted to leave the European Union (EU). On 29 March 2017 the Prime Minister triggered Article 50 of the Treaty on European Union, which commenced a two year period of negotiations regarding the UK's exit from the EU. There is no immediate change to legislation or policy affecting national infrastructure. Relevant EU Directives have been transposed into UK law and those are unchanged until amended by Parliament.

2. THE PROPOSED DEVELOPMENT

2.1 Introduction

2.1.1 The following is a summary of the information on the Proposed Development and its site and surroundings prepared by the Applicant and included in its Scoping Report. The information has not been verified and it has been assumed that the information provided reflects the existing knowledge of the Proposed Development and the potential receptors/ resources.

2.2 Description of the Proposed Development

2.2.1 The Applicant's description of the Proposed Development, its location and technical capacity (where relevant) is provided in Chapters 2 – 3 of the Scoping Report and in the associated figures and appendices.

2.2.2 The Proposed Development involves the remodelling and expansion of the existing Heathrow Airport (the Airport) to enable an increase in operating capacity from 480,000 air transport movements (ATM) per annum to at least 740,000 ATM per annum, and from around 76 million passengers per annum (mppa) to 130 mppa. The Scoping Report states that the Proposed Development is defined as a Nationally Significant Infrastructure Project (NSIP) under the terms of Section 22 (for works to the M25) and Section 23 (for the increased capability facilitated by the new runway and terminals) of the PA2008. There will also be Associated Development to the NSIPs.

2.2.3 The Proposed Development is to be located at the existing site of the Airport and in the surrounding area, as shown in Figure 3.1 of the Scoping Report. The Scoping Report states that the extent of development (including Associated Development) shown in Figure 3.1 is "*the maximum extent based on all of the options for components that have been the subject of consultation in Consultation 1*". The final application may therefore be based on a smaller development footprint.

2.2.4 Scoping Report Figure 1.3 shows that the main proposed operational airport development, as defined by the 'Heathrow Planning Boundary', lies within the administrative area of the London Boroughs (LB) of Hillingdon and Hounslow, which are part of the Greater London Authority. However, the wider project is located across the administrative areas of South Bucks District Council (DC); Buckinghamshire County Council (CC); Slough Borough Council (BC); Spelthorne BC; Surrey CC; and the Royal Borough of Windsor and Maidenhead.

2.2.5 The key components of the Proposed Development include:

- a new third runway of between 3,200m and 3,500m in length located to the northwest of the Airport, with connecting taxiways;

- re-alignment of the M25 motorway and other road network changes including diversions to the A4 and A3044 and associated junction works;
- development of additional terminal and satellite buildings and changes to internal access roads;
- development of additional aircraft stands and apron space;
- diversion of the River Colne, the Colne Brook, the River Wraysbury, the Longford River and the Duke of Northumberland's River and creation of compensatory flood storage;
- upgrading of the current central bus station;
- delivery of airport supporting facilities including, but not limited to: cargo floor space; fuel storage; maintenance, repair and overhaul floorspace; an air traffic control tower; upgraded and new waste water treatment and network infrastructure; diversion, relocation, protection and/or expansion of the public utilities network; energy generation plant; upgraded and new waste and recycling centres; and consolidation of car parking;
- the displacement of certain commercial uses, infrastructure and major facilities currently in place at the existing airport such as: immigration removal centres; Lakeside Waste Management Facilities; British Airways' Waterside office; BT data centre and maintenance depot; Total fuel depot; SSE substation and pylons; Total rail head; and
- temporary construction facilities, including contractor compounds, lorry parks, concrete plants, assembly facilities, borrow pits, stockpiles and construction workers' accommodation. The Applicant also proposes to use offsite logistics hubs located across the UK for the delivery of materials.

2.2.6 The Applicant estimates that the Proposed Development will require a peak construction workforce of up to 15,000 workers and create approximately 40,000 new jobs during operation.

2.2.7 Section 3.4 of the Scoping Report states that the indicative period for the construction of the new runway and any components required for operation of the runway is currently 2021-2026, but that the construction of terminals and associated infrastructure will be phased, and is expected to be fully developed by 2035. The construction phase includes: the enabling works for site preparation (2011- 2024); and the airfield expansion including the runway and taxiways works (2024 – 2026); the operational phase includes operational commencement of the third runway (2026 onwards); and delivery of the campus development including construction of the new terminals and satellite buildings (2023 – 2035).

2.2.8 The Scoping Report proposes to adopt a series of construction and operational assessment scenarios in the ES, which cover these phases of development. In addition to the construction and operational scenarios the Applicant proposes to assess an early release of capacity to increase the current ATM cap by 25,000 ATM per year, enabling the two existing runways at the Airport to accommodate around 505,000 ATM per year.

2.2.9 The Airport is located in a semi-urban area with the communities of Longford, Harmondsworth, Sipson, Harlington, Cranford Cross, Cranford, Hatton, Heston Hounslow, Feltham North, Bedfont, Stanwell, Stanwell Moor, Poyle, Colnbrook, Iver and Richings Park; Brands Hill and West Drayton bordering its perimeter or within close proximity to the airport. These communities comprise a mixture of residential, industrial and commercial uses. The area is subject to a number of heritage and landscape designations as set out in Scoping Report (for example paragraph 13.6.4). It is bounded to the north by the A4, to the west by the A3044, to the east by the A30 and to the south by the southern perimeter road, the Duke of Northumberland's River and Longford River. The M25 is within 600m of its western perimeter.

2.2.10 Large areas of open land, parts of which are designated as greenbelt, are located within a short distance to the west and north of the Airport. The footprint of the Proposed Development falls partially within the Colne Valley Regional Park, and extends to land adjacent to the northwest of Staines Moor, part of which is designated as a Site of Special Scientific Interest (SSSI). The Airport also sits in two main river catchments, being the River Colne to the west and the River Crane to the east, and is bounded by a number of associated watercourses to the west. A number of reservoirs are located to the west and south west of the area including the Queen Mother Reservoir, Wraysbury, King George VI, Staines North and Staines South reservoirs. These waterbodies are component parts of the South West London Waterbodies Ramsar site and Special Protection Area (SPA).

2.2.11 As shown on Figures 2.2 – 2.4 of the Scoping Report, the Airport currently comprises two runways, four terminals and a network of taxiways and stands, along with ancillary facilities to support its operation and maintenance such as cargo storage, and other airport related development such as hotels, offices and warehouses. The existing access to the Airport is shown on Figure 2.5 of the Scoping Report.

2.3 The Planning Inspectorate's Comments

Description of the Proposed Development

2.3.1 The Scoping Report provides options for the principal components of the Proposed Development, such as the location of taxiways, the terminal capacity and apron space, southern access options, parkway options, the diversion of watercourses and flood compensation, and changes to the road network including the A4, A3044 and M25 realignments and changes to junction arrangements at Stanwell Moor and the M25 J14 and 14a,

(Scoping Report Figures 3.3 – 3.12). Paragraph 3.3.37 of the Scoping Report lists proposed airport supporting facilities, the potential location of which are shown in Figure 3.13.

2.3.2 Due to the ongoing nature of the design development, the Scoping Report lacks specific information on the characteristics of elements to the Proposed Development e.g. dimensions, elevations or final locations of various structures, the displaced uses, the highways structures required as part of the changes to the road network, the green infrastructure to be provided as mitigation and the detailed design of covered river corridors.

2.3.3 The Scoping Report references proposed public transport infrastructure to access the airport such as the Western Rail Link to Heathrow (WRLTH) NSIP and Southern Rail Link to Heathrow. The ES should take account of any potential overlap between the expansion proposal and proposed public transport infrastructure links, detailing the outcome of consultations with Network Rail.

2.3.4 Limited information is provided regarding the detail of any public utilities diversions. The Inspectorate notes that the consultation responses from Affinity Water, Cadent, ESP Utilities Group, HSE and National Grid have all identified utilities infrastructure that may be impacted by the works.

2.3.5 The Inspectorate appreciates that at this point in the evolution of the Proposed Development a final description may not yet be confirmed, and that there are currently different options for certain works. However, the Applicant should be aware that the description of the Proposed Development provided in the ES must be sufficiently certain to meet the requirements of the EIA Regulations. The ES must include a detailed description of all components of the Proposed Development and should include reference to the location, alignments and dimensions of each individual element, including maximum heights, design parameters and limits of deviation. Where appropriate this information should be accompanied by figures to assist the reader.

2.3.6 This description of the development in the ES should explain the relationship between the Proposed Development and outstanding permissions (eg for Terminal 5) or agreed works (eg works to enable the end of the Cranford Agreement) that may be incorporated into, or excluded from, the DCO application.

2.3.7 Chapter 2 of the Scoping Report provides a description of the existing site of the Airport and its surroundings. However, in providing information on the existing land uses, the Scoping Report focuses on the site of the Airport, rather than the existing uses on the other land parcels identified in Figure 3.1 that fall outside the Heathrow Planning Boundary. The ES should contain a description of the location of the Proposed Development, which includes existing land uses and, where relevant structures across the application site and surrounding area.

2.3.8 The Scoping Report acknowledges at paragraph 3.2.7 that the DCO will seek permission for “associated and ancillary development”. The

Applicant should clearly define in the draft DCO (dDCO) which elements of the Proposed Development are integral to the NSIP and which are Associated Development under the PA2008 or an ancillary matter. Any proposed works and/or infrastructure identified as Associated Development, or as ancillary to the Proposed Development (whether on or off site) should be assessed as part of an integrated approach to the environmental assessment.

2.3.9 Paragraph 3.3.43 of the Scoping Report states that the consenting mechanism for certain components of airport related development and replacement displaced uses has not yet been determined, and that these elements could come forward through the application for a DCO, through the local planning process and/or left to the market. The Inspectorate advises that the ES and dDCO should provide certainty as to the elements of the Proposed Development forming part of the application. Where any element of mitigation is to be relied upon for the purposes of the Proposed Development it should be brought forward through the application for a DCO and be secured in the DCO itself. The ES should include a similar plan clearly distinguishing between the land that is required for delivery of the Proposed Development through the DCO, and any land that is necessary for Associated Development or development to be brought forward through other means.

2.3.10 As discussed above, the scenarios to be assessed are still being developed. The Applicant should ensure that the phases of the Proposed Development, and the activities to be undertaken during each phase, are clearly explained in the ES, and consistently reflected in the aspect assessments. Where uncertainty exists and flexibility is required the assessment should be based on worst case assumptions about the duration of the construction phases, and include consideration of the potential effects of construction activities occurring in conjunction with the operational activities of the Airport.

2.3.11 The options development also includes a range of construction options such as the location of construction sites, borrow pits and stockpiling sites. Figure 3.17 of the Scoping Report identifies the potential temporary construction sites for the full range of construction activities listed at paragraph 3.4.16 of the Scoping Report. The Applicant should ensure that the ES provides specific information on which construction activities are to take place at the various sites identified, and should explain the length of time for which each of these elements would be required. Information should also be provided on the number, size and final location of the construction compounds, and should assess any potential significant effects from the use of construction compounds within relevant aspect assessments.

2.3.12 Chapter 9 of the Scoping Report raises the potential requirement for construction worker accommodation. In the interests of sustainable design, where such accommodation is proposed, the Applicant is recommended to consider the longer term use of this development e.g. as residential housing following construction.

2.3.13 The Scoping Report refers to the demolition of existing properties at paragraph 3.2.5 but provides limited details regarding the properties that are to be demolished. As part of the description of the physical characteristics of the Proposed Development, the ES should provide full details of the proposed demolition works and it should be clear at what point in the construction programme the demolition activities would occur. The Applicant should ensure that the ES aspect chapters assess the likely significant effects resulting from demolition activities taking into account their extent and duration.

2.3.14 The Scoping Report's description of the Proposed Development refers to various "upgrades" to current infrastructure at the Airport, including the central bus station, the waste water treatment network and the waste and recycling centres. It is not clear whether demolition will be necessary to enable this upgrade to existing infrastructure. The ES should clearly explain which elements of the existing infrastructure on the site would be demolished, and which would be retained and refurbished.

2.3.15 In addition to the above, the ES should also include a description of the anticipated:

- construction methods and activities associated with each phase of construction;
- numbers of workers and the hours of working;
- types of plant and machinery;
- lighting equipment/requirements, in particular any lighting at construction compounds;
- number, type, movements and parking of construction vehicles (both heavy goods vehicles (HGVs) and staff vehicles);
- noise; and
- any Construction and Environmental Management Plan or Code of Construction Practice to be drafted.

Alternatives

2.3.16 The EIA Regulations require that the Applicant provide 'A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'.

2.3.17 The Inspectorate acknowledges the Applicant's intention to consider alternatives as a discrete chapter in the ES. This should provide details of the reasonable alternatives studied and the reasoning for the selection of the chosen option(s), including a comparison of the environmental effects.

Flexibility

2.3.18 The Applicant's attention is drawn to the Inspectorate's Advice Note Nine 'Using the 'Rochdale Envelope'[1], which provides details on the recommended approach to follow when incorporating flexibility into a dDCO.

2.3.19 The Applicant should make every attempt to narrow the range of options and explain clearly in the ES which elements of the Proposed Development have yet to be finalised and provide the reasons. At the time of application, any Proposed Development parameters should not be so wide-ranging as to represent effectively different developments. The development parameters will need to be clearly defined in the dDCO and in the accompanying ES. It is a matter for the Applicant, in preparing an ES, to consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the Proposed Development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of Regulation 14 of the EIA Regulations.

2.3.20 It should be noted that if the Proposed Development materially changes prior to submission of the application for development consent, the Applicant may wish to consider requesting a new scoping opinion.

Airspace Change Process

2.3.21 Paragraphs 1.7.3 to 1.7.12 of the Scoping Report explain the relationship between the main processes applicable to the Proposed Development. These include the DCO process administered by the Inspectorate and the Airspace Change Process (ACP), which is administered by the Civil Aviation Authority (CAA). The CAA also has responsibility for the regulatory approvals process for airport operations.

2.3.22 An application for development consent will be examined in accordance with the legislative requirements of the PA2008 and is primarily concerned with issues relating to powers that would be authorised by the DCO. The ACP is distinct from the DCO process and is concerned with the detailed design of airspace (including specific flight paths). Although they are distinct there is an apparent interface between the two processes particularly with regards to the location of arriving and departing planes.

2.3.23 Paragraph 1.7.8 states that the Scoping Report will consider the impacts of indicative flight path designs - likely geographic areas and prototype routes that are likely to become operationally viable flight path options. Precise flight path designs cannot be approved by the DCO process and

[1] Advice Note nine: Using the Rochdale Envelope. 2012. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

would instead be subject to extensive consultation as part of the separate ACP process.

2.3.24 The Inspectorate considers that the ES methodology should be compatible with the methodological approaches outlined in the CAA's CAP 1616[2] and CAP 1616a[3] documents to ensure consistency and continuity between the two assessment processes. The ES should explain how the ES methodology for the application for development consent is compatible with the CAP methodologies.

[2] CAP 1616: Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements' Civil Aviation Authority, December 2017

[3] CAP 1616a: Airspace Design: Environmental requirements technical annex' Civil Aviation Authority, December 2017

3. ES APPROACH

3.1 Introduction

3.1.1 This section contains the Inspectorate's specific comments on the scope and level of detail of information to be provided in the Applicant's ES. General advice on the presentation of an ES is provided in the Inspectorate's Advice Note Seven 'Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements'[4] and associated appendices.

3.1.2 Aspects/ matters (as defined in Advice Note Seven) are not scoped out unless specifically addressed and justified by the Applicant, and confirmed as being scoped out by the Inspectorate. The Inspectorate notes that Chapter 3 of the Scoping Report contains tables listing the environmental aspects relevant to each of the principal components of the Proposed Development. The ES should be based on the Scoping Opinion in so far as the Proposed Development remains materially the same as the Proposed Development described in the Applicant's Scoping Report.

3.1.3 The Inspectorate has set out in this Opinion where it has/ has not agreed to scope out certain aspects/ matters on the basis of the information available at this time. Due to the numerous options that exist at this stage in the evolution of the Proposed Development, the Inspectorate considers that it would be inappropriate to scope out certain aspects/ matters. Therefore, and for the avoidance of doubt, only those aspects/ matters acknowledged by the Inspectorate as scoped out in the Aspect Based Scoping Tables at Section 4 of this Scoping Opinion are to be deemed as scoped out of the assessment.

3.1.4 The Inspectorate is content that the receipt of a Scoping Opinion should not prevent the Applicant from subsequently agreeing with the relevant consultation bodies to scope such aspects/ matters out of the ES, where further evidence has been provided to justify this approach. However, in order to demonstrate that the aspects/ matters have been appropriately addressed, the ES should explain the reasoning for scoping them out and justify the approach taken.

3.1.5 Where relevant, the ES should provide reference to how the delivery of measures proposed to prevent/ minimise adverse effects is secured through DCO requirements (or other suitably robust methods) and whether relevant consultation bodies agree on the adequacy of the measures proposed.

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[4] Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements and annex. Available from: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

3.2 Relevant National Policy Statements (NPSs)

3.2.1 Sector-specific NPSs are produced by the relevant Government Departments and set out national policy for NSIPs. They provide the framework within which the Examining Authority (ExA) will make their recommendation to the SoS and include the Government's objectives for the development of NSIPs. The NPSs may require or refer to specific environmental measures and objectives for NSIPs, which Applicants should incorporate into the design of their Proposed Development and assess within their ES.

3.2.2 The Applicant's Scoping Report identifies that the proposed application comprises an NSIP under the terms of Section 22 (for works to the M25) and Section 23 (for the increased capability facilitated by the new runway and terminals).

3.2.3 The Applicant's Scoping Report acknowledges that there is currently no designated sector-specific NPS for airport development. The Government consulted on a revised draft Airports NPS between 24 October 2017 and 19 December 2017. The final draft Airports NPS was published on 5 June 2018 and approved in Parliament on 25 June 2018 (the Proposed ANPS). The SoS for Transport is expected to designate the Proposed ANPS imminently. The ES should take account of any specific requirements set out in the designated ANPS within the relevant aspect chapters.

3.2.4 The other designated NPS relevant to the Proposed Development is the NPS for National Networks (NPSNN). The Proposed ANPS states that *'if there is conflict between the Airports NPS and other NPSs, the conflict should be resolved in favour of the NPS that has been most recently designated'*.

3.3 Scope of Assessment

General

3.3.1 The Inspectorate recommends that in order to assist the decision-making process, the Applicant uses tables:

- to demonstrate how the assessment has taken account of this Opinion;
- to identify and collate the residual effects after mitigation for each of the aspect chapters, including the relevant interrelationships and cumulative effects;
- to set out the proposed mitigation and/ or monitoring measures including cross-reference to the means of securing such measures (eg a dDCO requirement);
- to describe any remedial measures that are identified as being necessary following monitoring; and

- to identify where details that are contained in the Habitats Regulations Assessment (HRA report) (where relevant), such as descriptions of European sites and their locations, together with any mitigation or compensation measures, are to be found in the ES.

3.3.2 Some of the text in the Scoping Report, such as in the various figures provided, is small scale and difficult to read both on the paper and electronic copies (e.g. Figures 3.10, 3.12, 3.16 and 3.17). The Applicant is reminded that the information contained in the ES should be clearly legible and accessible to readers.

3.3.3 Table 1 of the Executive Summary to the Scoping Report identifies aspects of the assessment to be scoped out in high level terms. The information contained in the table does not particularly support the decision making process. On that basis the Inspectorate has not had regard to its information in reaching its decision on the scope of the assessment within an ES. For the same reasons only limited account has been taken of the environmental topic tables in chapter 3 of the Scoping Report. The requirement to cross reference between the summary scope of the assessment in Table 4.6 (which excludes proposed scope outs), tables in chapter 3; the actual scope of assessment in the aspect chapters; and scope development documents in the appendices has created some uncertainty in the proposed scope of assessment in the preparation of this Opinion and with the consultation bodies. Where relevant these points are addressed within the aspect tables below.

Baseline Scenario

3.3.4 The ES should include a description of the baseline scenario with and without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge. The Applicant should also clearly state which developments will be assumed to be under construction or operational as part of the future baseline.

3.3.5 The Inspectorate notes that a number of baseline and future baseline scenarios have been identified at an individual aspect level and that the baseline year may differ between assessments and as relevant to the construction/ operational scenario.

Forecasting Methods or Evidence

3.3.6 Baseline datasets used to underpin assessments should be collected in accordance with recognised standards and guidance, where available and relevant. Efforts should be made to agree baseline datasets with relevant consultation bodies.

3.3.7 The ES should set out the timescales upon which the surveys which underpin the technical assessments have been based. For clarity, this information should be provided either in the introductory chapters of the

ES (with confirmation that these timescales apply to all chapters), or in each aspect chapter.

3.3.8 The Inspectorate expects the ES to include a chapter setting out the overarching methodology for the assessment, which ensures a focus on 'significant' rather than 'non-significant' effects. Any departure from that methodology should be described in individual aspect assessment chapters.

3.3.9 The Scoping Report refers at paragraph 4.2.3 to the use of professional judgement in order to determine the likely significance of effects. The application of professional judgement used within the assessment should be fully justified in the ES.

3.3.10 The ES should include details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

Residues and Emissions

3.3.11 The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. Specific reference should be made to water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases, where relevant. This information should be provided in a clear and consistent fashion and may be integrated into the relevant aspect assessments.

3.3.12 Further commentary is provided in relation to the assessment of waste in section 4.15 of this Opinion.

Mitigation

3.3.13 Any mitigation relied upon for the purposes of the assessment should be explained in detail within the ES. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The ES should also address how any mitigation proposed is secured, with reference to specific DCO requirements or other legally binding agreements.

Risks of Major Accidents and/or Disasters

3.3.14 The ES should include a description and assessment (where relevant) of the likely significant effects resulting from accidents and disasters applicable to the Proposed Development. The Applicant should make use of appropriate guidance (e.g. that referenced in the Health and Safety Executives (HSE) Annex to Advice Note 11) to better understand the likelihood of an occurrence and the Proposed Development's susceptibility to potential major accidents and hazards. The description and assessment should consider the vulnerability of the Proposed Development to a potential accident or disaster and also the Proposed Development's potential to cause an accident or disaster. The assessment

should specifically assess significant effects resulting from the risks to human health, cultural heritage or the environment. Any measures that will be employed to prevent and control significant effects should be presented in the ES.

3.3.15 Relevant information available and obtained through risk assessments pursuant to European Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

3.3.16 Further comments on the Applicant's approach to assessing major accidents and disasters are provided in Table 4.11 of this Scoping Opinion.

Climate and Climate Change

3.3.17 The ES should include a description and assessment (where relevant) of the likely significant effects the Proposed Development has on climate (for example having regard to the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change. Where relevant, the ES should describe and assess the adaptive capacity that has been incorporated into the design of the Proposed Development. This may include, for example, alternative measures such as changes in the use of materials or construction and design techniques that will be more resilient to risks from climate change.

3.3.18 Further comments on the Applicant's approach to assessing climate change are provided in Table 4.4 of this Scoping Opinion.

Transboundary Effects

3.3.19 Schedule 4 Part 5 of the EIA Regulations requires a description of the likely significant transboundary effects to be provided in an ES.

3.3.20 Regulation 32 of the EIA Regulations inter alia requires the Inspectorate to publicise a DCO application on behalf of the SoS if it is of the view that the proposal is likely to have significant effects on the environment of another EEA state, and where relevant, to consult with the EEA state affected.

3.3.21 The Inspectorate considers that where Regulation 32 applies, this is likely to have implications for the examination of a DCO application. The Inspectorate recommends that the ES should identify whether the Proposed Development has the potential for significant transboundary impacts and if so, what these are and which EEA States would be affected.

3.3.22 Section 4.8 and paragraph 7.9.53 of the Scoping Report identifies two environmental aspects in relation to which a transboundary effect could conceivably arise – carbon (specifically greenhouse gas emissions (GHG)) and biodiversity. The Applicant concludes that the Proposed Development is not likely to have significant effects on another European Economic Area (EEA) State from GHG emissions and that it is very unlikely that the Proposed Development will have a significant biodiversity effect on the environment of any EEA State(s).

3.3.23 Consequently, the Applicant proposes that transboundary effects from GHG emissions do not need to be considered within the ES but that further consideration will be given to transboundary effects from impacts on biodiversity as part of the consultation regarding Preliminary Environmental Information. The Inspectorate notes the Applicant's conclusion in the Scoping Report regarding transboundary effects and recommends that, for the avoidance of doubt, the ES details and justifies this conclusion.

A Reference List

3.3.24 A reference list detailing the sources used for the descriptions and assessments must be included in the ES.

3.4 Confidential Information

3.4.1 In some circumstances it will be appropriate for information to be kept confidential. In particular, this may relate to information about the presence and locations of rare or sensitive species such as badgers, rare birds and plants where disturbance, damage, persecution or commercial exploitation may result from publication of the information. Where documents are intended to remain confidential the Applicant should provide these as separate paper and electronic documents with their confidential nature clearly indicated in the title, and watermarked as such on each page. The information should not be incorporated within other documents that are intended for publication or which the Inspectorate would be required to disclose under the Environmental Information Regulations 2014.

4. ASPECT BASED SCOPING TABLES

4.1 Air Quality and Odour

(Scoping Report Chapter 5)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
1	Table 3.6	Air quality effects on rivers and flood storage	Table 3.6 of the Scoping Report excludes operational air quality effects on rivers and flood storage. The Inspectorate considers that the potential for air quality effects on rivers and flood storage areas due to deposition of pollutants should be taken into account within the assessment, particularly where the Proposed Development has potential to give rise to stagnant or low flow conditions.
2	Table 5.9	Activities involving combustion – emissions of CO, SO_2, lead, benzene and 1,3 butadiene, arsenic, cadmium, nickel, mercury, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, dioxins/ furans, PCBs, HCB).	The Applicant proposes to scope out the identified pollutants on the basis that previous low concentrations (2010 and earlier) mean that Local Authority monitoring has ceased and based on previous best practice guidance set out in the Project for the Sustainable Development of Heathrow (PSDH)[5]). However SO_2, NO_2 and NO_x are identified as relevant combustion products for aviation projects by the CAA and the lack of recent baseline data to supplement the assessment undermines confidence that this position remains the same. The definition of activities involving combustion includes "*aircraft*

[5] Project for the Sustainable Development of Heathrow - Report of the Air Quality Technical Panels. Department for Transport, 2010.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			movements on the new runway and taxiways, land based activities in support of airport operation and road traffic" In the absence of a detailed description of what the potential sources arising from land based activities are (eg such as new generation plant and rail terminal sources), the Inspectorate considers that assessment of these pollutants cannot be scoped out at present. In addition, Biodiversity operational scope item 1 in Table 4.6 suggests that deposition of nitrogen and sulphur will be assessed for impacts on habitats and water, which would appear to contradict the need to scope out consideration of SO_2 from combustion processes. The Applicant should demonstrate that it is unlikely to give rise to significant air quality effects from these pollutants through the provision of a detailed screening assessment where relevant.
3	Table 5.9	Activities involving combustion – Exposure to ozone (O_3).	The Scoping Report states that local emissions associated with expansion are unlikely to significantly alter background O_3 concentrations. The PDSH study identified that ozone was not a priority area for modelling the impact of Heathrow emissions. The definition of activities involving combustion includes "*aircraft movements on the new runway and taxiways, land based activities in support of airport operation and road traffic".* In the absence of a detailed description of the land based activities, the potential for sources of ozone arising from sources such as new generation plant cannot be excluded. The Applicant should demonstrate that it is unlikely to give rise to significant air quality effects from this pollutant through the provision of a detailed screening assessment where relevant.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
4	Table 5.9	Activities involving combustion – Increased emissions of pollutants that form secondary PM.	The Inspectorate considers that insufficient justification has been provided to scope out an assessment of secondary particulate matter, in particular the lack of description of the specific pollutants that have the potential to form secondary particulates.
5	Table 5.9	Jettisoning of fuel from aircraft in flight resulting in increased emission of aviation fuel odours causing loss of amenity at sensitive receptors under flight paths.	The Inspectorate considers that significant effects are not anticipated in relation to this matter and that it may be scoped out from further assessment. This is on the basis that jettisoning of fuel is an infrequent and abnormal event required for the purposes of operational safety with existing operational procedures in place that are designed to avoid odour effects.
ID	**Para**	**Other points**	**Inspectorate's comments**
6	Table 3.6 Table 4.6	Operational traffic	The list of items to be assessed in Table 4.6 includes vehicles on public highways however it is unclear whether emissions from vehicles within the operational site are proposed to be assessed. For example, Table 3.6 excludes air quality effects from car parking areas. For the avoidance of doubt the ES should include an assessment of on-airport vehicle emissions and their effect on human and ecological receptors.
7	Table 4.6	Emissions from aircraft operation	Emissions from aircraft operation are scoped in with respect to effects on human health but not for biodiversity. The Inspectorate considers that the ES should consider the potential for likely significant effects on biodiversity from aircraft emissions.
8	Table 4.6	Odour (operation)	The scope of the odour assessment focuses on construction site emissions and Volatile Organic Compounds (VOC) from aircraft. The effect of odour on sensitive receptors arising from odour

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			sources such as relocated wastewater treatment plant infrastructure and new waste and recycling centres should also be assessed in accordance with IAQM guidelines unless otherwise justified.
9	Table 5.2	Interim Advice Note (IAN)174/13 and IAN175/13	IAN174/13 excludes assessment of $PM_{2.5}$ as it predates 1 January 2015, which is set out in The Air Quality Standards Regulations 2010 as the date by which the $PM_{2.5}$ limit value must be met. Whilst the general principles of the IAN may be followed, the applicant should include assessment of the effects of $PM_{2.5}$.
10	5.4.4	12km x 11km area	The Applicant proposes to predict pollutant concentrations across a 12km x 11km 'core assessment area' based on findings from previous studies. The Inspectorate considers that the Applicant should not apply an arbitrary limit to the assessment area based on previous studies, since the Proposed Development is more extensive and covers a wider geographic area than set out in those studies. The Inspectorate considers that the model extent should be defined by the area over which significant air quality effects arising from the Proposed Development may occur. This should be clearly defined within the ES. The ES should have regard to the Air Navigation Guidance 2017 with respect to the parameters for assessment of aviation emissions on local air quality.
11	5.4.9	DMRB screening criteria	The Inspectorate considers that DMRB screening criteria are appropriate for the identification of affected road links on the strategic road network. The ES should apply the screening criteria set out in the EPUK and

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			Institute of Air Quality Management (IAQM) 2017 guidance 'Land Use Planning & Development Control: Planning for Air Quality' (the EPUK-IAQM guidance) to identify affected road links on the urban road network.
12	5.4.13-5.4.14	Assessment of compliance with EU limit values	These paragraphs suggest that the 'assessment methodology will focus on the incremental change in road traffic related NO_2 concentrations as a result of the DCO Project'. The ES should consider and model concentrations of other relevant vehicle emissions such as PM_{10} and $PM_{2.5}$. In addition, as currently written, the text appears to exclude consideration of airport emissions from the compliance assessment. For the avoidance of doubt the Inspectorate considers that these should be included within the assessment.
13	5.5.7 - 5.5.8	Baseline PM, dust and odour surveys	The Inspectorate notes that it is not proposed to include supplementary baseline monitoring for PM or NO_2 since these are routinely monitored in the area by the Applicant and the Local Authorities. In light of the extended nature of the development (eg including areas proposed for flood storage and borrow pits) that fall outside the immediate Heathrow area, the ES should include baseline monitoring for the wider study area where relevant. The Applicant should make effort to agree the final scope of such monitoring with relevant consultation bodies once the footprint of the Proposed Development has been confirmed. The ES should document the proposed method of data collection, which should be conducted in accordance with recognised standards. The baseline data within the ES should be up to date and represent the entire study area, details such as the location of

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			monitoring stations and the extent of air quality management areas (AQMA) should be confirmed with the consultation bodies. The air quality monitoring should draw on the data held within the London Air Quality Network and from adjacent local planning authorities, identifying any areas of localised poor air quality (eg M25, M4). Efforts should be made to agree the scope and extent of air quality baseline datasets and model validation requirements with the relevant local planning authorities where possible, drawing on existing local authority monitoring supplemented by additional monitoring where necessary. Baseline datasets should comprise a minimum 6 months of data. The odour and dust baseline dataset should be supported by any complaints history information. The Scoping Report proposes that PM, dust deposition and odour surveys will be undertaken in advance of the construction programme. The Applicant should ensure that the draft CEMP includes sufficient provision for pre-construction monitoring consistent with the relevant Institute of Air Quality Management (IAQM) guidance. The ES should describe the methodological approach to be adopted for each of the proposed studies.
14	5.7.2	Deposition of SO_2	It is proposed that deposition of sulphur is scoped out from consideration of eutrophication, since sulphur levels are very low in the area and adjacent to the road network. This approach excludes the potential for deposition of sulphur from other sources eg rail. The ES should screen the potential effect of sulphur deposition from all relevant sources including rail and consider their potential for in-combination effects.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
15	Table 5.8	Vehicular traffic associated with the operational airport	The operational assessment should include consideration of non-combustion PM sources eg brake and tyre linings as well as direct emissions from vehicle exhausts.
16	Table 5.8	Emissions of PM from aircraft	The operational assessment should consider the potential for PM emissions from non-combustion sources, such as the wear of brake linings and tyres.
17	5.9.17 5.9.31	Assessment of odour in accordance with IAQM Guidance on the assessment of odour for planning 2014.	The Scoping Report states that dispersion modelling would not enable an evaluation of significant effects associated with increased Volatile Organic Compound (VOC) odour therefore, in accordance with IAQM guidance, a semi-quantitative approach to the assessment will be undertaken. The ES should fully justify the approach, including detailed justification for not undertaking dispersion modelling.
18	5.9.25	Assessment of significance	The Inspectorate considers that DMRB significance criteria are appropriate for the identification of affected road links on the strategic road network. Criteria for exposure to $PM_{2.5}$ should be set out since these are not specifically addressed within DMRB. The ES should apply the significance criteria set out in the EPUK-IAQM guidance or similar to identify affected road links on the urban road network. Where the Proposed Development will give rise to non-vehicular emissions (such as those arising from on-site energy generation), the relevant sector specific guidance produced by the Environment Agency should inform the assessment criteria where necessary.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
19	5.10.1 – 5.10.3	Draft Code of Construction Practice (CoCP)	The ES should demonstrate how the measures set out within the draft CoCP will be secured e.g. by providing cross references to the relevant draft DCO requirement.
20	5.10.3	Rail freight	Whilst the Inspectorate acknowledges that use of rail freight has potential to reduce vehicle related air quality impacts, the scope of assessment should screen the potential for increased rail freight emissions to give rise to air quality impacts during construction and operation, including emissions of SO_2.
21	Appendix 5.1, 1.4.2	Use of the National Atmospheric Emissions Inventory (NAEI)	The air quality assessment currently proposes to use the NAEI dataset, the ES should be based on the most relevant information available, for example the London Atmospheric Emissions Inventory as highlighted by TfL. Robust justification should be provided if alternative datasets are relied on for the purposes of the assessment.
22	Appendix 5.1	Precise approach for derivation of annual mean NO_2 concentrations will be developed in accordance with government guidance available at the time of the assessment and agreed with the Air Quality Expert Review Group (AQERG).	The ES should document any assumptions used in the derivation of NO_2 concentrations.

4.2 Biodiversity

(Scoping Report Chapter 6)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
23	Section 6.8, Tables 6.11 and 6.12	Adverse effects (including cumulative) on ecological features of local and negligible importance, as these would not be considered 'significant'	The Scoping Report does not provide sufficient justification as to why it intends to deviate from the CIEEM industry standard guidance for ecological impact assessment by not considering effects on ecological features of local importance. It also does not contain specific information on the types of habitats and species which would be considered to be of local or negligible value. In the absence of specific information on the likely ecological features of local and negligible importance, including cumulative effects on such features both within the Proposed Development and from other projects or plans, together with the scale of the Proposed Development which could result in effects such as local extinctions of a species/habitats, the Inspectorate does not agree to scope this matter from the assessment. Accordingly the ES should include an assessment of effects on ecological features of local importance arising from the Proposed Development, including cumulative effects, or provide adequate justification in the ES as to why effects on any ecological features of local importance subsequently identified would not be considered to be significant. The ES and/or accompanying appendices should identify the species and habitats to be included in the biodiversity offsetting metric, including those considered to be of local/negligible importance.

ID	Para	Other points	Inspectorate's comments
24	Section 6.3	Evidence Plans and Stakeholder Engagement	The Inspectorate welcomes the Applicant's intention to use an evidence plan process to seek agreements with relevant stakeholders with regards to the biodiversity assessment. The Applicant should seek to agree the type and level of evidence to be collected to inform the assessment in respect of biodiversity, together with approaches to the assessment methodology. Evidence of agreements reached in respect of the ecological impact assessment should also be provided with the ES, where possible.
25	Paragraphs 6.4.1 to 6.4.3, paragraph 6.9.12, Figures 6.1, 6.2 and 6.10	Study area and Zone of Influence	The Inspectorate notes that the biodiversity study area presented in Figure 6.1 and Baseline Data Collection Area presented on Figure 6.2 do not include the waterbodies identified as part of the survey area for wintering birds, in particular the Wraysbury complex of waterbodies, Kingsbury, and South Horton, as presented on Figure 6.10. The ES should present the final biodiversity study area on clear figures consistent with the biodiversity scope of assessment. The assessment study area should be applicable to the likely zone of influence (ZoI) of the Proposed Development, the potential for likely significant effects and the relevant ecological feature concerned. The Inspectorate acknowledges that the ZoI may vary by ecological feature and type of effect. The ES should consider all ecological features of importance that could be significantly affected by the Proposed Development within the ZoI, including, but not limited to, species and habitats that could be affected as a result of hydrological-links to the Proposed Development, species and habitats sensitive to air quality changes, and more mobile species. The Applicant should review and amend the ZoI, as necessary, as

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			the design of the Proposed Development evolves prior to any DCO application to ensure that all ecological features of importance that could be significantly affected by the Proposed Development have been identified and assessed in the ES. The Applicant should ensure the desk study information used to inform the assessment is also informed by the ZoI and updated accordingly. The biodiversity aspect chapter should include appropriate and specific cross-references to any studies presented elsewhere in the ES (eg to any hydrology or air quality modelling) that have been used to determine the ZoI for ecological features.
26	Table 6.3	Study Area for air quality effects	The Inspectorate notes that all SSSIs within 2km of the biodiversity study area have been identified in the Scoping Report. This 2km search area is stated to have been determined through precautionary professional judgement. In respect of European sites, footnote 19 explains that a search area of 20km has been applied on the basis of "*road traffic modelling accompanying the Airports Commission Final Report (July 2015) as nitrogen deposition associated with road traffic accessing/egressing the airport will need to be addressed within the HRA*". The Scoping Report does not make clear why a 2km buffer is appropriate for SSSIs and other ecological features of importance potentially sensitive to air quality effects. The ES should consider all SSSIs beyond 2km where likely significant effects could occur on SSSI features sensitive to changes in air quality which could arise from the Proposed Development (ie within the ZoI for the Proposed Development). This should include an assessment of all sources of air quality

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			changes from the Proposed Development and also cumulatively, as appropriate. The ZoI should be identified in conjunction with the air quality aspect chapter to determine the distance of search. The Applicant should make efforts to agree the approach to assessing air quality effects on European sites and SSSIs with relevant consultation bodies (eg Natural England), where possible.
27	Paragraph 6.6.5	Survey access	The Inspectorates notes the following statement in the Scoping Report "*Areas where survey has not been possible pre-application, or planned activities have been curtailed, will be highlighted at later stages of the DCO Project, with suitable mitigation measures dealing with this issue suggested and discussed with consultees.*" The Applicant must ensure that sufficient baseline information has been obtained to inform the assessment of effects and mitigation within the ES.
28	Paragraph 6.6.15	Main River and ordinary watercourse classification	Any open water assessed in the ES should be clearly identified and classified by type (eg Main River, ordinary watercourse, lake, ditch) and the applicable survey methodology clearly stated (eg River Corridor Survey, Ditch Habitat Survey). The ES should also clearly identify where a river/stream becomes a ditch with regards to Main River and ordinary watercourse classification. The ES should be supported by clear figures in respect of water bodies.
29	Paragraphs 6.6.9 to 6.6.11,	Ancient woodland and veteran trees	The ES should clearly identify any ancient woodland (including Ancient Semi-Natural Woodland (ASNW) and Plantation on Ancient Woodland Sites (PAWS)) and veteran/aged trees that

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	Table 6.1, Table 6.4, and Appendix 6.1 – Section 4: National Vegetation Classification Survey Methodology and Programme.		could be affected by the Proposed Development and ensure they are valued and assessed in the ES, where significant effects could occur. The ES should also clearly identify and assess any ancient woodland and/or veteran trees that do not already form part of a designated site, together with any veteran/aged trees that do not already form part of ancient woodland. The Applicant's attention is also directed to the additional guidance documents identified on pages 2 to 3 of the Forestry Commission's response (see Appendix 2). The Applicant should consider the applicability of these documents when compiling the ES. The Inspectorate recommends the Applicant seek the advice of relevant consultation bodies (including the Forestry Commission and Natural England) with regards to potential significant effects on ancient woodland (including ASNW and PAWS) and veteran/aged trees, including any proposed compensation and/or offsetting measures for such effects.
30	Paragraph 6.6.18 and Appendix 6.2	Notable Plant Species	Paragraph 6.6.18 of the Scoping Report states that no plant species listed in Schedule 8 of the Wildlife and Countryside Act have been identified during the desk study or surveys undertaken in 2017; however, Appendix 6.2 identifies the presence of Bluebell in the study area. The Inspectorate acknowledges that Bluebell is identified in Schedule 8 as protected from sale only; however, the ES should be clear with regards to the protected status of the species assessed. The Applicant's attention is also directed to the comments of Spelthorne BC with regards to the presence of Brown Galingale in seedbank on Shortwood Common, which is listed in Schedule 8 of

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			the Wildlife and Countryside Act. The ES should include an assessment of effects on any notable plant species arising from the Proposed Development, where significant effects are likely to occur.
31	Table 6.10	Likely significant effects – effects on riparian habitat and lateral connectivity (construction)	The ES should also consider any likely significant effects on riparian habitat and lateral connectivity as a result of activities associated with the realignment/diversion/modification of river/stream channels during construction.
32	Table 6.10	Likely significant effects – surface water run-off (operation)	The ES should consider effects on ecological features arising from changes to surface water run-off during operation (such as increased flow due to increased impermeable surfaces, as identified in Table 18.8 of the Scoping Report), where likely significant effects could occur. The Biodiversity aspect chapter of the ES should include appropriate cross-reference to the information and assessment in the Water aspect chapter.
33	Table 6.10 and Appendix 6.4: Biodiversity offsetting strategy	Likely significant effects – provision of biodiversity habitats around Heathrow through the establishment and management of the green infrastructure approach (operation)	The ES should clearly state the likely effectiveness and deliverability of the proposed measures associated with the provision of biodiversity habitats.
34	Table 6.10	Likely significant effects – effects to off-site ecological features arising from the displacement of users of existing green space	The ES should consider any likely significant effects associated with increased recreational pressure on ecological features/sites of importance as a result of displaced users of existing green space to be lost to/affected by the Proposed Development. The

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
		(construction and operation)	ES should include appropriate cross-reference to other relevant aspect chapter assessments in this regard, including the Community chapter and the proposed Open Space Assessment. The Applicant's attention is also drawn to the comments of South Bucks DC with regards to a mitigation strategy currently under development in respect of recreational pressure at Burnham Beeches Special Area of Conservation (SAC).
35	Table 6.10	Creation of new flood storage areas and wetland habitats	The creation of new flood storage areas and wetland habitats identified within the Scoping Report to the north of Heathrow Airport has potential to increase bird-strike risk. Design of new wetland habitats should minimise their attractiveness to species of birds hazardous to air traffic.
36	6.9.6	Worst case scenarios – temporal scope	The Inspectorate notes the intention to assess a worst-case for the 'majority of features' during construction. The ES should clearly state the assumptions used for the biodiversity assessment for each receptor/likely significant effect.
37	General	Connectivity	The ES should ensure that ecological connectivity is adequately considered and assessed, including effects on the existing connectivity (including hydrological links) and connectivity to and from any proposed offsetting/compensatory habitat to be provided. The Applicant should consider how value associated with connectivity could be taken into account in the biodiversity offsetting metric approach.
38	General	Mitigation	The Inspectorate notes the intention to include the detailed design of mitigation measures in the ES but to also include a holistic approach to project design and mitigation/compensation

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			design in the biodiversity offsetting metric. Measures to be provided to mitigate impacts predicted through the EIA process should be clearly stated in the ES and secured in the draft DCO, as appropriate. The ES should clearly identify significant effects that are to be mitigated and those that are to be included as part of a compensation and/or biodiversity offsetting approach.
39	General	Monitoring	Where monitoring of habitats and species is identified for the purposes of mitigation/compensation/enhancement, the ES and/or associated appendices should clearly set out the monitoring proposals, including: methods to be used; appropriate timings; criteria for determining success/failure; mechanisms for implementation; and frequency and duration of monitoring, feedback and reporting. The Applicant should ensure that monitoring measures to be included for the purposes of the EIA are appropriately secured in the draft DCO.
40	Appendix 6.1: Biodiversity Method Statements Paragraph 11.3.8	Electro-fishing survey methodology	The Applicant's attention is drawn to the comments of the Environment Agency in Appendix 2 of this Opinion confirming that more than three electro-fishing runs may be necessary to obtain worthwhile analysis.
41	Appendix 6.1: Biodiversity	Survey methodologies and referencing	The ES and/or accompanying appendices should describe in detail the survey methodology/technique used to inform the ES, particularly where new or novel techniques have been applied

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	Method Statements Paragraphs 11.3.11 to 11.3.13		(for example eDNA techniques). The ES and appendices should also provide the reference for any survey guidance that has been followed.
42	Appendix 6.2: Biodiversity Desk Study Report Table 6.2.8	Habitats of Priority Importance - riverine priority habitat	The River Crane (Priority Habitat) and River Colne (Priority for Restoration) should also be included within Table 6.2.8 and assessed in the ES.
43	Paragraphs 6.9.11, Table 6.11, and Appendix 6.4: Biodiversity offsetting strategy	Biodiversity offsetting for ecological features of local/ negligible importance	The Inspectorate notes at Paragraph 6.9.11 and Table 6.11 of the main body of the Scoping Report that the Applicant intends to consider any negative residual effects on ecological features of local/negligible importance in the Biodiversity Offsetting Metric. As stated at point 1 above, the ES should clearly identify all species and habitats that are to be accounted for in the biodiversity offsetting metric. The information regarding features of local/negligible importance will also need to be presented in the ES and/or accompanying appendices, where such features are to be included in the biodiversity offsetting metric to ensure they have been adequately considered.
44	Appendix 6.3: Biodiversity offsetting	Biodiversity Offsetting	The ES should include sufficient detail with regard to the proposed compensation areas, including clear figures, together with the detailed calculations that have been used for the biodiversity offsetting metric. Any mitigation/compensation

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	strategy		measures relied upon in the ES should be appropriately secured through the draft DCO.
45	General point for the ES and Appendix 6.3: Biodiversity offsetting strategy	Existing mitigation/compensation	The ES should clearly identify where any of the existing habitat that would be affected by the Proposed Development has previously been allocated as mitigation/compensation land for other development and consider what influence this would have on the assessment of likely significant effects and the proposed biodiversity offsetting metric approach. The Applicant's attention is drawn to the comments of eg Surrey CC and LB Hillingdon with regards to land within the Scoping Report study area that has been restored or used as mitigation for other development.

4.3 Carbon and other Greenhouse Gases

(Scoping Report Chapter 7)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
46	7.9.22 - 23	Exclusion of CO_2 emissions from arriving flights	The Inspectorate recommends that the ES assesses the impact on arriving flights to the extent that the new airspace design affects the arriving traffic consistent with the CAP1616a requirements.
47	Table 3.7	Airport supporting facilities	Table 3.7 indicates that the identified airport supporting facilities are not relevant to this aspect of the ES, apart from energy generation plant. The Inspectorate advises that airport supporting facilities should not be scoped out of the GHG emission calculations for this aspect of the ES until it can be demonstrated that these facilities do not give rise to a significant effect, for instance in combination with other elements of the Proposed Development.
ID	**Para**	**Other points**	**Inspectorate's comments**
48	7.9.3- 7.9.7	Approach to assessment of effects – temporal scope	The temporal scope of the assessment for the construction and operational phases for this aspect of the Proposed Development is anticipated to be 2021-2050. The ES should justify the choice of peak construction and operation years selected for the assessment of emissions scenarios.
49	7.7 Table 7.5	Likely significant effects requiring assessment	The Inspectorate recommends that loss of vegetation including trees and woodland should be included in the GHG calculations used for assessment. The Forestry Commission's response is highlighted in this respect.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
50	7.9.8 - 7.9.10 Graphic 7.1	Assessment scenarios – future improvement assumptions	The Scoping Report highlights anticipated decreases in GHG emissions from improvements in the aviation sector in aircraft engine fuel consumption efficiencies, the adoption of biofuels, or improved airspace design in future. The assumptions and uncertainties regarding future improvements scenarios, including any sensitivity analysis, should be clearly set out in the ES, in order to understand the reliance placed on such measures in assessing likely significant effects.
51	7.9.18 – 7.9.31	Methodology - emissions from aircraft operations	As highlighted by the CAA in their consultation response, the Inspectorate advises that the impact from annual total tonnage of CO_2 emissions from aircraft operations should be presented. The ES should consider these emissions in the wider context of the UK carbon budgets and climate change obligations.
52	7.9.30 - 7.9.31	Methodology – CAP1616	In line with the methodology used for CAP1616, the ratio for conversion of aviation fuel burn to CO_2 should be 3.18 as highlighted by the CAA in their consultation response.

4.4 Climate Change

(Scoping Report Chapter 8)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
53	8.8	Effects not requiring assessment	The Scoping Report states that no effects have been scoped out of the in-combination climate change impacts (ICCI) and climate change resilience (CCR) assessments but that Stage 1 of the ICCI assessment will consider all aspects (topics) and will determine which aspects remain scoped in for detailed assessment and which are scoped out. Any aspects or matters subsequently scoped out of the assessment should be fully justified within the ES and efforts made to agree these with relevant consultation bodies.
ID	**Para**	**Other points**	**Inspectorate's comments**
54	8.3 Table 8.2	Stakeholder engagement with statutory consultation bodies	The Inspectorate notes that the Applicant has consulted the Environment Agency regarding the proposed approach with respect to the water environment and intends to consult with the Heathrow Strategic Planning Group (HSPG). The Applicant should ensure that other consultation bodies with statutory responsibilities for other assessment aspects (eg biodiversity), such as Natural England, are consulted regarding the potential for climate change effects to influence the effectiveness of any proposed mitigation measures.
55	8.5 8.6, 8.9	Baseline conditions – UK Climate Projects (UKCP)09 and UKCP18	The ES should take into account the potential impacts of climate change using the latest UKCP available at the time of preparation. This should include where appropriate the anticipated UKCP18

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	Table 8.1 Appendix 8.1.		projections.
56	8.6 3.4.21	Assessment of decommissioning of infrastructure elements	The Inspectorate notes that based on the nature of the Proposed Development, for the purpose of the climate change assessments its operational period is estimated as being 100 years. The Scoping Report describes the use of "*intermediate timeframes*" to allow consideration of infrastructure elements with more short-lived operational periods. The Inspectorate advises that the ES includes details of any infrastructure elements predicted to be decommissioned over a shorter time period and give consideration to the potential for likely significant effects to arise in relation to these elements.
57	8.6.8 – 8.6.11	Future climate baseline	The ES should set out the assumptions and uncertainties in the projections and explain how these have informed the climate change risk and resilience assessments and influenced the design of the Proposed Development.
58	8.7 Tables 8.3 - 8.4	Likely significant effects requiring assessment	The ES should explain the duration of any temporary effects, ensuring consistency with the other aspect assessments.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
59	8.9 Tables 8.3 - 8.8	Study area and methodology – initial ICCI assessment and CCR assessment	Paragraph 8.9 notes that the as the DCO project is refined the study areas will be confirmed. The final study areas for the ICCI and CCR assessments should encompass the Proposed Development and any Associated Development that the Applicant tends to include within its application for development consent.
60	8.9.26 8.9.50 8.10	Mitigation measures	The Inspectorate advises that the ES should clearly explain which mitigation measures would be 'embedded' and which would comprise further or additional mitigation including those incorporated into the Climate Change Adaptation Plan which is intended to be included in the application for development consent. The ES should set out how mitigation measures will be secured through the DCO. The ES should describe how the adaptation measures incorporated into a Climate Change Adaptation Plan will address the need for on-going review of climate "hazards" and risks

4.5 Community

(Scoping Report Chapter 9)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
61	Table 3.7 (Chapter 3)	Airport supporting facilities	Table 3.7 indicates that the airport supporting facilities are not relevant to this aspect of the ES, apart from the proposed new cargo floor space and car parking. The Inspectorate advises that insufficient justification has been presented to scope this matter out from further assessment and is therefore not scoped out.
ID	**Para**	**Other points**	**Inspectorate's comments**
62	9.7 9.9 Table 9.5 & Table 9.6	Proposed approach to assessment of likely significant effects - sensitivity criteria	The Inspectorate notes that the sensitivity criteria in Table 1.2 of Appendix 9.1 give two examples of matters that could indicate user sensitivity, whereas Table 9.8 of the Scoping Report combines these examples into a single criterion with the addition of the word "and". This potentially reduces the number of receptors that may fall within a sensitivity category. The ES should ensure that the methodology does not exclude receptors from consideration or reduce their assessed sensitivity
63	9.10	Mitigation measures	The ES should explain how the design of any green infrastructure to mitigate the effects of the Proposed Development will be incorporated into the network of existing green infrastructure which may be used by the community for recreational purposes. Mitigation for significant adverse impacts on the existing green infrastructure network (eg including increased recreational pressure), other areas of open space, and to public access to National Trails such as the Colne Valley Trail, and other public

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			rights of way that are used as recreational facilities, should be clearly set out in the ES and secured within the dDCO.
64	9.10.11	Transitional effects on the provision of public services	The Scoping Report indicates that mitigation of any significant effects on the provision of public services, related to temporary employment generated during the construction phase of the Proposed Development, would be limited to 'transitional' effects. These effects are not made explicit as to their nature or duration, and should be clearly set out in relation to the assessment of likely significant effects and any mitigation that may be required. The ES should address the potential for significant effects on public services to arise due to the provision of new worker accommodation including houses of multiple occupancy, where relevant.

4.6 Economics and Employment

(Scoping Report Chapter 10)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
65	Table 10.7	Increased trade, FDI and Tourism to the UK as a result of improved connectivity and aviation capacity	The EIA Regulations require an assessment of likely significant effects on population. The Scoping Report requests to scope out effects associated with increased trade, FDI and tourism however, the proposed methodology for the assessment includes consideration of policy positions and socio-economic objectives of local and regional authorities. The Scoping Report does not explain the extent to which any of the matters set out in Table 10.7 account for the objectives at a local and regional authority level. On this basis, the Inspectorate considers that these matters should be assessed where relevant to that methodology.
66	Table 10.7	Effect on property value and availability	The Applicant states that it is not possible to estimate "*empirically*" the quantitative effect of this Proposed Development on the wider property market because of the scale of the development and uncertainties due to the length of construction and operational periods. The Applicant however accepts that there will be effects on property and compensation will be made available to eligible parties. The ES should clearly explain how the compensation payments will mitigate the likelihood of significant effects.
ID	**Para**	**Other points**	**Inspectorate's comments**
	10.9.11	Projections of economic and demographic change at	The ES should set out details of economic projections applicable to the Proposed Development and the construction and operational scenarios applicable to the DCO, for the assessment as well as

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
		assessment years	any assumptions or limitations with the projections.
68	10.9	Mitigation	The ES should explain the Applicant's strategy for securing the delivery of employment and apprenticeship opportunities.

4.7 Historic Environment

(Scoping Report Chapter 11)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
69	11.8	Effects not requiring assessment	The Applicant intends to scope out effects on the setting of heritage assets during the construction phase within a 'wider study area' as it is considered that likely significant environmental effects will only arise as a result of "*perceptual change*" to the setting of heritage assets during operation of the Proposed Development and only in relation to heritage assets that are considered sensitive to changes in noise levels and vibration. The Inspectorate agrees in principle that effects on the setting of heritage assets within the wider study area due to construction activities within the 'core study area' can be scoped out due to distance from the site boundary of the Proposed Development. However, the wider study area, as discussed in paragraph 11.4.5, should be clearly defined and the ES should assess the potential for adverse effects on heritage assets and their setting from noise and vibration from construction vehicles once the haul routes for these vehicles are clarified. This assessment should also include noise and other adverse effects from any increased aircraft movements during the construction phase. This assessment of potential adverse effects could be done for example through cross referencing to the noise and vibration and transport assessments supporting the ES.

ID	Para	Other points	Inspectorate's comments
70	11.4	Study area	The potential for significant effects from airport operations on the settings of heritage assets beyond the 'core' study area and also within the Zone of Theoretical Visibility (ZTV) should be considered in the ES. The study area should consider the inclusion of the Grade I Registered Park (Windsor Forest and Great Park) for assessment as this is located immediately outside the western limit of the study area within Surrey and the Royal Borough of Windsor and Maidenhead, and the Grade II Registered Park (Ditton Park) located within the borough of Slough.
71	11.9	Proposed approach to the assessment	The ES should set out the Applicant's proposed methodology for developing and implementing an archaeological research framework from the early stages of the project through to completion. This should include a commitment to analysis, publication and museum archiving. The ES should demonstrate how archaeological investigations to support the application for development consent have informed the methodology. The ES should set out how these commitments will be secured through the DCO.
72	11.9.19	Assessment of likely significant historic environment effects during peak earthworks and peak above ground infrastructure construction	The Inspectorate does not consider that peak earthworks or above ground infrastructure necessarily correlate with the worst case for the assessment of historic environment effects, since effects will relate to the sensitivity of a heritage feature and the extent of direct or indirect impacts on that feature. The construction assessment should consider the period in which the most substantial impacts arise to the most sensitive and greatest number of features.

ID	Para	Other points	Inspectorate's comments
	11.10	Mitigation and enhancement measures	The Inspectorate considers that the approach to mitigation section should emphasise the need to preserve heritage assets in-situ, where possible and appropriate. The Applicant should make effort to agree mitigation approaches with relevant consultation bodies.

4.8 Health

(Scoping Report Chapter 12)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
74	Table 3.6	Rivers and flood storage	The Scoping Report proposes to scope out the assessment of health impacts associated with rivers and flood storage out of the environmental assessment. The Inspectorate considers that insufficient information has been provided to justify the scoping out of this matter at this stage. Where significant effects are likely to occur, this should be assessed within the ES.
75	Table 3.7	Aviation fuel storage facilities	The Scoping Report proposes to scope out the assessment of health impacts associated with aviation fuel storage facilities out of the environmental assessment. The Inspectorate considers that insufficient information has been provided to justify the scoping out of this matter at this stage. Where significant effects are likely to occur, this should be assessed within the ES.
76	12.8	Health impacts associated with a changing global climate	The Scoping Report proposes to scope this matter out of the health assessment as a climate change assessment will be undertaken to consider resilience to global climate change and the measures that will need to be taken to adapt to climate change. The Inspectorate is satisfied that health impacts associated with changes to the global climate (as a result of the Proposed Development only) can be scoped out of the health assessment but would expect to see adequate cross-referencing and signposting to the matter within the health chapter of the ES.
77	12.8	Risks to construction workers from exposure to contamination	The Scoping Report proposes to scope this matter out of the health assessment as this will be addressed in the land quality

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
		in soil	assessment. The Inspectorate is satisfied with this approach but would expect to see adequate cross-referencing and signposting to the matter within the health chapter of the ES.
78	12.8	Outbreaks of communicable diseases	The Scoping Report proposes to scope this matter out of the health assessment as the operational control measures that are currently in place are expected to continue to apply to the Proposed Development. The Inspectorate does not consider that sufficient information has been provided to justify the scoping out of these matters at this stage. The Applicant must provide an in-depth justification for such scoping out, including an explanation of the current systems, controls, procedures and requirements that are currently in place to address these matters. Where significant effects are likely to occur, this should be assessed within the ES
79	12.8	Emergency response measures to potential man-made and natural disasters	The Scoping Report proposes to scope this matter out of the health assessment as this is to be reported in the Major Accidents and Disasters section of the ES. The Inspectorate is satisfied with this approach but would expect to see adequate cross-referencing and signposting to the matter within the health chapter of the ES.
80	12.8 12.8.3	Effects to population health from water quality due to the Proposed Development	The Scoping Report proposes to scope this matter out of the health assessment as this is to be regulated by the Environment Agency as part of the consenting process. The Inspectorate is satisfied with this approach but would expect to see adequate cross-referencing and signposting to the assessment of water quality within the health chapter of the ES.
81	12.8	Effects to population health from	The Scoping Report proposes to scope this matter out of the

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	12.8.3	flooding due to the Proposed Development.	health assessment as this is to be regulated by the Environment Agency as part of the consenting process. As flooding could create a public health emergency in the area, and a perceptual risk of flooding along local communities could lead to impacts on health, the Inspectorate does not consider that enough information has been provided at this stage to demonstrate that there are no likely significant effects in this regard. Where significant effects are likely to occur, this should be assessed within the ES and mitigation proposals such as a flood risk management plan and the interaction of the Applicant with emergency services should be presented.
82	12.8 12.8.3	Effects to population health from hazardous waste due to the Proposed Development	The Scoping Report proposes to scope this matter out of the health assessment as this is to be regulated by the Environment Agency as part of the consenting process. The Inspectorate is satisfied with this approach but would expect to see adequate cross-referencing and signposting to the waste assessment and land quality within the health chapter of the ES.
83	12.8 12.8.4	Pest control measures	The Scoping Report proposes to scope this matter out of the health assessment as this will be covered by standard construction practice that will be followed, and reviewed by the relevant local planning authorities. The Inspectorate does not consider that enough information has been provided to demonstrate that there are no likely significant effects in this regard. The Applicant must provide an in-depth justification for such scoping out, including an explanation of the current systems, controls, procedures and requirements that are currently in place to address these matters. Where significant effects are likely to occur, this should be assessed within the ES.

ID	Para	Other points	Inspectorate's comments
84	12.1.9	Determinants of health and well-being	The Inspectorate welcomes the Applicant's intention to examine the ecological determinants of health and well-being shown in Graphic 12.1 of the Scoping Report in its assessment of human health. The Applicant should ensure that the ES also examines the social determinants of health and well-being, to include living and working conditions, social and community networks, and individual lifestyle factors.
85	12.3.4	Stakeholder engagement	The Inspectorate welcomes the Applicant's engagement with Health and Wellbeing Boards, Clinical Commissioning Groups and health trusts, as set out in Table 12.2 of the Scoping Report. The ES should clearly set out which specific trusts, board and clinical commissioning groups the Applicant has engaged with, and the outcome of such engagement.
86	12.3.4	Stakeholder engagement	Table 12.2 of the Scoping Report states that the Applicant has engaged with owners and operators of *'specific facilities that are impacted by the project'*. The ES should clearly set out which facilities this refers to and the outcome of such engagement.
87	12.4.5	Study area	The Applicant states that the study area will vary depending on which determinant is being assessed. It should be clear in the text of the ES which study area is being applied to each determinant and effect in the assessment of health impacts. This should include a clear cross reference to the relevant sections of other chapters and, where relevant, the supporting plans in order to assist the reader.
88	12.5.2,	Baseline	The Scoping Report states that baseline data collection is on-going. The ES should clearly set out all studies and surveys

	12.9.4		undertaken to inform the final baseline dataset, including a description of the current health and community facilities within the study area. The Applicant should seek to agree its approach with the relevant consultation bodies. The ES should present the likely changes in health facilities and infrastructure within the relevant study area in the future baseline scenario, outlined in the Scoping Report as the full year of operations prior to the opening of a third runway.
89	12.7	Likely significant health effects – light pollution	Table 12.3 of the Scoping Report only identifies light pollution from the Proposed Development as a potentially significant effect during construction. The Inspectorate does not consider that enough information has been provided to demonstrate that there are no likely significant effects in relation to light pollution during operation. Where significant effects are likely to occur, this should be assessed within the ES.
90	12.7	Likely community health impacts – electromagnetic fields	The Scoping Report does not assess the health impact associated with electromagnetic fields around elements of the Proposed Development such as cabling. The Inspectorate does not consider that enough information has been provided to demonstrate that there are no likely significant effects in relation to electromagnetic fields at this stage. Where significant effects are likely to occur, this should be assessed within the ES.
91	12.7, 12.9.24	Receptors	The Scoping Report outlines that the general population scope of the health assessment considers residents of, and visitors to-, local communities, the workforce and passengers of the Airport, and construction workers for the Proposed Development. It then states that the focus of the health assessment is on 'community effects'. It is therefore unclear whether the assessment of health impacts will in practice be limited to local communities. The ES should contain an in-depth explanation of the approach to

			identifying the receptors forming part of the assessment, taking into account the various study areas applicable to the assessment of health impacts. Where this information is set out in another ES chapter, the Applicant should ensure there is adequate cross referencing and signposting to aid the reader.
92	12.9.1	Study area	The Scoping Report states that the various study areas to be used in the assessment of health impacts are to be kept under review as the design of the Proposed Development progresses. The ES should clearly evidence and justify the final extent of the study area used in the assessment of health impacts. Where this information is set out in another ES chapter, there should be adequate cross referencing and signposting to aid the reader.
93	12.9.7	Baseline	The Scoping Report states that the baseline to be used for most matters considered in the health assessment will be 2016. The ES should include justification for the selected baseline year.
94	12.9.7	Assessment years	The Scoping Report states that construction effects will be assessed at the point where “maximum environmental effects” are experienced. The ES should ensure that the assessment takes account of the different phases of the Proposed Development and the different impacts each phase could have on different receptors, including the early release of ATMs. For the purposes of the health assessment, the Inspectorate recommends that the assessment years mirror those in the air quality, noise and traffic and transport assessments as closely as possible. The ES should thoroughly justify the assessment years chosen and ensure that the worst case scenario has been assessed on all identified receptors.
95	12.9.10	Assessment methodology	The assessment methodology should be based on up to date and relevant information including tools prepared by the NHS London

			Healthy Urban Development Unit where applicable. The Applicant's attention is drawn to the Hillingdon Clinical Commissioning Group consultation response in this regard.
96	12.9.13	Health pathways	The Scoping Report states that the source-pathway-receptor model establishes the plausibility of a potential effect, and once a plausible association is established, a conclusion on the likelihood of an impact occurring is made. The Applicant should ensure that the ES sets out in detail the plausibility and likelihood for each potential effect. Where an effect is plausible but the Applicant concludes that an impact is not likely to result in a significant effect, this should be clearly presented and justified as part of the health assessment.
97	12.9.13, 12.9.16, Table 12.7	Scientific evidence and literature	The Scoping Report refers in numerous places to the use of scientific evidence and literature as part of the assessment methodology. The ES should clearly reference the evidence and literature relied upon to inform the assessment. If necessary, in order to inform understanding of the assessment this information should be provided in Appendices to the ES.
98	Table 12.6	Health effects subject to qualitative analysis	Table 12.6 details potential health effects from different sources. However, certain sources have been identified as having an impact on "wellbeing" only rather than "physical health and wellbeing". The Inspectorate considers that sources such as living conditions, environment and economy have the potential to impact on physical health in addition to wellbeing and should be assessed in the ES accordingly.
99	12.10.6 – 12.10.10	CoCP and Health Management Plan	The Scoping Report refers to the drafting of a CoCP and Health Management Plan as part of its mitigation proposals. Drafts of these documents should be provided with the DCO application. If the ES relies upon mitigation measures which would be secured through such documents, there should be clear cross-reference made to where such measures are set out in the documents.

4.9 Landscape and Visual Amenity

(Scoping Report Chapter 13)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
100	13.8	Adverse seascape effects, including cumulative effects.	The Applicant proposes to scope out an assessment of effects from the Proposed Development on the seascape, including any relevant cumulative effects. The justification for this is based on the fact that the Proposed Development does not lie within a marine or coastal location. The Inspectorate is satisfied that having regard to the location of the Proposed Development significant effects to seascape are unlikely to occur and this matter can be scoped out.
ID	Para	Other points	Inspectorate's comments
101	13.1.4; 13.6.2	Tranquillity	The Scoping Report sets out the intention to conduct an assessment of impacts to tranquillity (as it relates to character of the landscape) and makes reference to Campaign to Save Rural England's Tranquillity Mapping in this regard. In addition to acknowledging tranquillity as a key factor in landscape character area sensitivity assessments the ES should also include consideration of significant effects on tranquillity from overflying aircraft. The Applicant should also ensure that an assessment of impacts to tranquillity relevant to other aspects is assessed in the relevant ES chapters.
102	13.3	Stakeholder engagement	The Scoping Report explains that engagement with the HSPG on agreeing the approach to the assessment and mitigation of landscape and visual impacts of the Proposed Development. The Inspectorate recommends that similar effort is made to consult with any surrounding local authorities and other relevant organisations that may be affected by the Proposed Development

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			but not represented in the HSPG eg Chilterns AONB Conservation Board.
103	13.4	Study Area	The Scoping Report states that the study area extends to a 5km radius from the maximum amount of land being considered for the full range of options for the Proposed Development, but that this may continue to evolve to accommodate any changes as the design process progresses. The ES should clearly evidence and justify the final extent of the study area used in the assessment of landscape and visual impacts, having regard to the Zone of Theoretical Visibility. The study area should contain all likely significant effects of the Proposed Development on any component of landscape and visual resource and effort should be made to agree this with relevant consultation bodies, where possible.
104	13.5.1	Baseline Data Collection	The Scoping Report states that baseline data collection is on-going, with both desk studies and field surveys undertaken to date. The ES should clearly set out all studies and surveys undertaken to inform the final baseline information, including the timing of any site visit and how/if professional judgement has been applied. The Applicant should make effort to agree its approach with the relevant consultation bodies.
105	13.5.2	Zone of Theoretical Visibility (ZTV)	The Scoping Report states that a preliminary ZTV for operational infrastructure and development components has been mapped based on indicative height parameters for the various components of the Proposed Development, and that this will be updated as the DCO process progresses. The ES should clearly evidence and justify the final extent of the ZTV used in the assessment of landscape and visual impacts, based on actual height parameters.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			The ZTV should be agreed with relevant consultation bodies where possible. The ES should describe the model and methodology used and should provide information on the area covered and the seasonal timing of any survey work. The operational assessment should consider the movement of aircraft along the proposed runway, and stationary aircraft at the proposed stands in the operational ZTV to ensure that these elements are thoroughly assessed.
106	13.6.7	Representative Viewpoints	The Applicant should agree the viewpoints to be included in its assessment with relevant consultation bodies including the HSPG and other affected local authorities, where possible and should ensure that the ES consider such viewpoints both during the day and at night, and during both winter and summer. The ES should explain the reasons supporting the inclusion of each viewpoint to be assessed, and where relevant a justification for excluding any viewpoints that have been requested by the consultation bodies. The ES should include photographic visualisations of both the baseline view and the view incorporating the Proposed Development, which should be numbered and cross-referenced to accurately plotted locations on an OS map of appropriate scale, which should also show the angle of view. The importance of local landmarks and viewpoints, and the assessment of the extent and direction of views from properties should also be recorded. The assessment should also take into consideration any committed development.
107	13.7.1	Cumulative effects	The Scoping Report states that cumulative landscape and visual amenity effects will be assessed in accordance with the approach set out in section 4.6 of the Scoping Report. For the avoidance of doubt, the Inspectorate considers that such assessment should

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			include existing and proposed developments, including other proposals currently at the scoping stage. It should also consider the relevance of cumulative impacts in protected landscapes, such as the route of HS2 within the Chilterns AONB.
108	13.10	Mitigation	The Scoping Report states that mitigation will be considered during the preparation of a CoCP, and as part of the iterative design development process. The Applicant should ensure that the effectiveness of any proposed mitigation measures are thoroughly assessed in the ES, describing the likely significant effects of the Proposed Development both prior to mitigation and residually so that it is possible to understand the efficacy of proposed mitigation measures. The ES should also explain how measures proposed to mitigate landscape and visual effects, such as planting, may relate to other aspects, for instance impacts on ecological receptors. Appropriate cross-reference should be made between related aspects in the ES, such as Biodiversity, and Historic Environment.

4.10 Land Quality (including soils and geodiversity)

(Scoping Report Chapter 14)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
109	Table 14.7	Loss of non-Best and Most Versatile (BMV) agricultural land	The Inspectorate considers that the agricultural land quality assessment should focus on assessing the loss of BMV land (as defined in the National Planning Policy Framework). The Inspectorate therefore considers that an assessment of the loss of non-BMV agricultural land is not required, although such loss should be quantified within the ES.
110	Table 14.8	Temporary loss of access to mineral deposits preventing extraction	The Scoping Report does not provide any specific information to support the request to scope this matter out. In absence of detail relating to the specific sites and the consequential impacts that may occur should their current or planned mineral extraction status change, the Inspectorate considers that temporary loss of access to mineral deposits preventing their extraction may result in significant effects and this matter cannot be scoped out from assessment in the ES.
ID	**Para**	**Other points**	**Inspectorate's comments**
111	n/a	Study area	The Inspectorate recommends that interpretative reports are sectioned by local authority area in order to facilitate understanding of the potential effects at a local level.
112	14.9.7	Level of data collected to support the ES will be dependent on the availability of site access to undertake ground investigation	The Applicant must ensure that sufficient baseline information has been obtained to inform an adequate assessment of effects and to demonstrate the required mitigation within the ES.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
		surveys	Additional baseline with respect to landfill and minerals sites is provided in the local authority consultation responses (eg Surrey CC, Spelthorne BC and South Bucks DC).
113	14.9.11	Agricultural Land Classification (ALC) survey methodology	In accordance with the Natural England guidance, the list of activities should also include consideration of local climate and site data as part of the reporting process.
114	14.9.55 Table 14.8	Significance criteria	The Scoping Report indicates that only effects with major magnitude would be assessed as being significant. The Scoping Report does not explain why medium magnitude effects would not be significant when they include "permanent effects that will sterilise a significant proportion of a mineral deposit". The ES should provide further justification to support the methodology applied in determining significance. It is also unclear why the magnitude of effect criteria include temporary access effects, since the Scoping Report seeks to scope out such effects in Table 14.8.
115	Appendix 14.1, 8	Bibliography	BS1075:2011+A2:2017 replaces the 2013 version of the standard and should be used to undertake the assessment.

4.11 Major Accidents and Disasters

(Scoping Report Chapter 15)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
116	Table 15.6-15.7 and Appendix 15.5	Various proposed matters to scope in / out of assessment	The Inspectorate has identified inconsistencies between Tables 15.6-15.7 and Appendix 15.5 of the Scoping Report with regards to matters to scope in or out of the assessment. The Inspectorate is therefore uncertain of the full extent of matters to be scoped out of the major accidents and disasters assessment. The ES should ensure that any matters applicable to this aspect and likely to result in significant effects are assessed.
117	Table 15.7 and Appendix 15.5	External transport accidents involving aircraft not under the control of the Airport during both construction and operation; Absent or deficient safety/environmental management systems (e.g. inadequate planning, resource, provision, procedures); Absent or deficient security provision (e.g. inadequate planning, resource provision, procedures)	The Scoping Report proposes to scope these matters out from the assessment of major accidents and disasters on the basis of the low risk and the requirement for air transport activities to be managed through a licensing regime and in compliance with CAA/EASA codes of practice. However sufficient information has not been provided to demonstrate that there are no likely significant effects in this regard, particularly due to the change in aircraft track interactions with other airports as a result of the Proposed Development which may have an impact on external transport accidents. Where significant effects are likely to occur, this should be assessed within the ES and the relevant CAA/EASA codes of practice to be relied upon by the Applicant to mitigate such effects should be presented.
118	Table 15.7 and Appendix	Structural failure caused by landslip/land movement due to natural phenomena during	The Scoping Report proposes to scope this matter out from the assessment of major accidents and disasters on the basis that the change in risk is not significant in comparison to the current

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
	15.5	construction and operation	baseline. The Inspectorate does not consider that this provides suitable explanation to support a decision to scope this matter out of the assessment. The ES should assess impacts to land stability from the Proposed Development and where significant effects are likely to occur. The ES should be informed by any necessary investigations confirming that the Proposed Development its site and immediate surrounds will remain stable.
119	Table 15.7 and Appendix 15.5	Ash cloud, volcanic eruptions and other natural phenomena affecting in flight safety resulting in aircraft having an impact on construction activities or aircraft incident	The Scoping Report proposes to scope this matter out from the assessment of major accidents and disasters on the basis that the change in risk is not significant in comparison to the current baseline. While the Inspectorate considers that ash cloud and volcanic eruptions may be scoped out of the assessment, sufficient information to describe 'other natural phenomena' has not been provided to justify a scoping out of the other elements at this stage. The ES must detail the current baseline in order to justify this approach, and should provide clarity on the range of events defined as "other natural phenomena" along with a thorough evidence base to support the scoping out of such matters from the assessment.
120	Table 15.7 and Appendix 15.5	Malicious attack during construction or operation (terrorism, sabotage, vandalism or theft) including cyber-attack or widespread public disorder during construction either within the Proposed Development or external, leading to effects on the Proposed Development	The Scoping Report proposes to scope this matter out from the assessment of major accidents and disasters on the basis that security experts from the Centre for the Protection of National Infrastructure and the DfT to ensure that physical, procedural and personnel security measures have been adequately considered in the design process, and that adequate consideration has been given to the management of security risks. The Scoping Report does not provide adequate information to justify scoping out this matter at present. The ES should provide evidence of confirmation with relevant consultation bodies that such measures have been

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			adequately considered, in relation to both the operational airport and the other surrounding land forming part of the Proposed Development, in order for the Inspectorate to be satisfied that this matter can be scoped out. Where significant effects are likely to occur, these should be assessed within the ES
121	Table 15.7 and Appendix 15.5	Occupational safety incidents during construction or operation affecting at most 1-2 workers including exposure to hazardous substances (chemical, biological, radiological), physical agents, and hostile environments (confined spaces or extreme temperatures) including falls from heights, vehicle impact during operation only	The Scoping Report proposes to scope this matter out from the assessment of major accidents and disasters on the basis that the risk is managed by safe working practices and preventative, protective measures and health and safety legislation. Justification should be provided in the ES for the scoping out of falls from heights and vehicle impact during the construction phase of the Proposed Development. The Applicant should also provide details of the safe working practices and preventative, protective measures that are currently in place or likely to be in place for the Proposed Development. Where significant effects are likely to occur, these should be assessed within the ES
122	Table 15.7 and Appendix 15.5	Events external to the site resulting in release of biological agents, biohazard, disease, food and water contamination having an effect on construction or operation; Importation of biological agents/ biohazard/ disease/ pathogen including disembarkation of passengers and/ or flight with controlled disease/ biohazard; Release/ exposure to hazardous substance (chemicals,	The Scoping Report proposes to scope these matters out from the assessment of major accidents and disasters on the basis that current systems to address these matters will be extended to the Proposed Development. The Inspectorate does not consider that sufficient information regarding the existing control mechanisms been provided to justify the scoping out of these matters at this stage. The Applicant must provide an in-depth justification for such scoping out, including an explanation of the current systems, controls, procedures and requirements that are currently in place to address these matters. Where significant effects are likely to occur, this should be assessed within the ES

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
		radiological/biological) during import or export due to inadequate documentation/ screening; Release of disease/ biohazardous material from quarantine/ storage centres including waste and disposal; External aircraft interference (lasers, fireworks, sky lanterns, drones, wind turbine interaction with radar); Damage to artefacts of national or international importance during import or export; Industrial action or loss of widespread utility failure external to site resulting in failure of key mitigation measures; Space weather (e.g. geomagnetic storms, radiation storms and solar flares) leads to loss of systems (e.g. loss of primary navigation system or loss of communications); Food/water contamination due to failure of onsite monitoring,	

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
		handling, control and management, including security; and Loss of essential air safety and airside systems or loss of safety critical workers (e.g. due to industrial action or pandemic illness).	
123	Table 15.7 and Appendix 15.5	Disease outbreak in surrounding area with potential for further infection beyond the airport and/or impairment of essential services (including fire service and policing) or damage to valuable species	The Scoping Report proposes to scope this matter out from the assessment of major accidents and disasters on the basis that the Airport, working with Public Health England, has passenger disembarkation controls in line with UK border control requirements, with facilities subject to inspection by the CAA. The Inspectorate notes however that Table 15.7 does not refer to damage to valuable species, which is only listed as scoped out in Appendix 15.5 with very limited justification. As explained above, the ES should clearly set out which matters are to form part of the assessment of major accidents and disasters. The ES should also provide details of the passenger disembarkation controls that are currently in place and to be relied upon for the purposes of the assessment in order to justify the scoping out of this matter. Where significant effects are likely to occur, this should be assessed within the ES.
124	Table 15.7 and Appendix 15.5	Wake vortex leading to property damage	The Scoping Report proposes to scope this matter out from the assessment of major accidents and disasters on the basis that this is below the threshold for a major accident and disaster. The Inspectorate is content that impacts associated with this matter are unlikely to represent major accident and disaster significant

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			effects and can be scoped out of the assessment.
ID	**Para**	**Other points**	**Inspectorate's comments**
125	Table 15.1	Policy and Legislation	Table 15.1 does not include the Civil Contingencies Act 2004, which the ES should have regard to in carrying out its assessment of major accidents and disasters.
126	Table 15.2	Stakeholder engagement	The Inspectorate notes the effort made to engage with the HSPG, and recommends that a similar level of effort is made to consult with local authorities likely to be affected by the Proposed Development but not otherwise represented in the HSPG.
127	15.6	Baseline conditions	The Scoping Report states that the baseline conditions have been largely informed by other topic chapters. The Applicant should ensure that the ES provides an in-depth description of the baseline for the assessment of major accidents and disasters, including cross referencing and signposting to the relevant sections of other chapters that are being relied upon. In addition to the conditions set out in other aspect assessments the ES should establish a baseline in respect of natural disasters, for example setting out the current susceptibility of the site to seismic movement, extreme storms, tornadoes, snow and fog.
128	15.4 15.9.1	Study Area	The Scoping Report states that the study area may continue to evolve to accommodate any changes as the design process progresses. The ES should clearly evidence and justify the final extent of the study area used in the assessment of landscape and visual impacts. The study area should contain all likely significant effects of the Proposed Development from the perspective of

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			major accidents and disasters and should be agreed with relevant consultation bodies including the CAA, HSPG and other affected local authorities.
129	Table 15.5	Flight phases	The Scoping Report does not assess the impact associated with how aircraft are moved to, from and around the airport or the impact associated with manoeuvring or missed approaches. The Inspectorate does not consider that sufficient information has been provided to demonstrate that there are no likely significant effects in relation to this. Where significant effects are likely to occur, this should be assessed within the ES.
130	Table 15.6	Likely significant effects	The Scoping Report does not assess the impact associated with mid-air accident risk. The Inspectorate does not consider that sufficient information has been provided to demonstrate that there are no likely significant effects in relation to this. Where significant effects are likely to occur, this should be assessed within the ES.
131	Table 15.6	Baseline conditions	The baseline description presented in the ES should take account of the major accident hazard sites and major accident hazard pipelines identified by the Health and Safety Executive in its consultation response, to ensure that a complete assessment of all likely significant effects can be undertaken.
132	15.9.3	Design evolution	The Scoping Report states that the progress in the design of the Proposed Development may lead to changes in the baseline, effects to be scoped into or out of the assessment and mitigation requirements. The ES must provide a clear explanation of the baseline and effects to be assessed from a major accidents and

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			disasters perspective, including a justification in respect of any deviation from this Scoping Opinion e.g. changes in matters to be scoped out of the assessment.
133	15.9.17	Assessment years	The assessment years for the purposes of the major accidents and disasters assessment in the ES should include the early release of ATMs to ensure that all likely significant effects have been identified.

4.12 Noise and Vibration

(Scoping Report Chapter 16)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
134	16.9.1	Vibration from construction and operational traffic on new, altered or existing roads.	The Inspectorate considers that an assessment of vibration effects arising from construction vehicles on the existing road network should be provided as part of the ES, in line with the methodological approach set out in the Design Manual for Roads and Bridges (DMRB).
135	16.9.2	Consideration of hearing loss.	The Inspectorate has had regard to information presented in paragraph 16.9.2 of the Scoping Report and considers that effects on hearing loss may be scoped out of the assessment as significant effects are unlikely to occur.
ID	**Para**	**Other points**	**Inspectorate's comments**
136	Table 4.6	Road traffic noise on the existing network	It is unclear from Table 4.6 whether the assessment includes consideration of road traffic noise within the site or on the new road network. For the avoidance of doubt, the impact of noise from traffic within the operational boundary of the Proposed Development should be assessed, where it has potential to give rise to likely significant effects on noise sensitive receptors in isolation or in combination with other noise sources.
137	16.6.20-30	Noise monitoring	The Scoping Report states that baseline noise monitoring will be undertaken but provides no detail regarding the proposed survey approach. Baseline noise monitoring should be undertaken to a recognised standard eg BS7445-1:2003 or equivalent. Baseline data should be up to date and representative of current

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			conditions.
138	16.7.8 16.10.34	Aircraft fleet mix	The Scoping Report proposes to make assumptions regarding future aircraft fleet mix. The assumptions regarding the potential fleet mix should be set out in the ES as well as the basis for any the sensitivity testing, allowing for a conservative, worst case assessment.
139	16.8.4	Town and Country Planning (EIA) Regulations 2017	Reference should be to an assessment of likely significant effects in respect of the Infrastructure Planning (EIA) Regulations 2017.
140	Table 16.7	L_{Amax} LOAEL and SOAEL criteria	The L_{Amax}/ number of events and a risk assessment of objective sleep disturbance are currently not specified for aviation (although it is for rail). The ES should set a specific threshold based on relevant guidance (eg World Health Organisation or similar).
141	16.4.5 and Footnote 35	Effects above LOAEL over 4,000ft	Whilst considering noise exposure above LOAEL to be unlikely above 4,000ft, the Air Navigation Guidance goes on to state that "but where such exposure does occur the CAA should ensure that the focus remains on minimising these impacts". The Applicant should consider the potential for exposure above LOAEL, likely to result in likely significant effects between 4,000 and 7,000ft, where relevant.
142	16.10.20 Graphic 16.3 footnote b	Method 2 (the 'ABC' method)	The ABC method is example method 1 in Annex E of the British Standard BS5228-1+A1:2014. Reference to Method 2 creates confusion as to whether the assessment proposes to apply ABC criteria (method 1) or a 5dB magnitude of change (method 2) criterion to inform the assessment of significance. The ES should provide a consistent description of the ABC method and the

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			applied criteria.
143	16.10.37	AEDT, ANCON or both	The statement that modelling may be taken either with AEDT or ANCON contradicts subsequent paragraphs suggesting that both models will be used to assess noise emissions. It is also unclear why two modelling approaches are required. The ES should justify the scope of modelling work undertaken with reference to relevant guidance and standards for aviation.
144	16.10.49	Calculations using ISO9613-2	The ES should set out the parameters and assumptions applied to the calculations of sound propagation.
145	16.10.51	'Data describing noise levels of aircraft which may include baseline measurements…'	The Inspectorate considers that source noise levels for aircraft should include baseline measurements of current operations.
146	16.10.52	Model assumptions including ground levels, building/ elevations, screens and ground types.	The description of development provided at scoping stage recognises that further evolution of the design will occur. The ES should ensure that any model outputs that are predicated on a current design of the Proposed Development have sufficient certainty of delivery to merit their inclusion as part of the worst case assessment.
147	16.10.68	Groundborne noise	The ES should include an assessment of groundborne noise from rail and any other relevant sources.
148	16.10.86	Qualitative assessment of non-significant effects from more than one source	The ES should justify the use of a qualitative rather than a quantitative approach to the consideration of combined effects arising from more than one source on a single receptor or area.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
149	16.10.87 Graphic 16.3	"Receptor by receptor or area by area basis"	Reference is made to a receptor by receptor or area by area assessment at a number of points within the text. Later sections describe a staged process of considering effects by area then by individual receptor where thresholds have been exceeded. It is assumed that the either/or approach is intended to reflect the staged process, which the Inspectorate considers to be appropriate rather than suggesting that either areas or receptors will be assessed.
150	Table 16.6 Graphic 16.3	Unacceptable adverse effect level (UAEL)	Reference is made to the UAEL in Table 16.6 but no other reference to assessment of UAEL is included in the text or in the process outlined in Graphic 16.3. The ES should define and assess UAEL for the Proposed Development.
151	Table 16.8	Magnitude of effect criteria	The magnitude of effect criteria are noted to be consistent with other NSIP assessments for receptors currently experiencing noise levels between LOAEL and SOAEL. The Scoping Report states that "*Greater weight will be given to change, even slight change, where the existing exposure already exceeds the relevant SOAEL*". The Inspectorate considers that additional criteria should be included to reflect the greater weight afforded to exposure already exceeding SOAEL. The ES should justify why more stringent criteria has not been adopted for the purposes of this assessment.
152	16.10.95	Updated World Health Organisation Community Noise Guidelines.	Where updated guideline values become available the ES should describe how the updated criteria have been taken into account.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
153	Graphic 16.3	Additional factors 3.	The description of additional factor three is missing text, making the intent of the statement unclear.
154	Table 16.9	Overflights	The threshold elevation angle used in consideration of overflights should be justified in the ES, with reference to relevant CAA guidance.
155	16.10.106c	Small or large population	The terms small or large population are combined with the magnitude of effect criteria. The ES should provide a clear definition of what will constitute a small or large population.
156	16.10.108	"is being developed"	The inclusion of methodological approaches that are in development limits the ability of the Inspectorate to comment on the scope of the assessment. The ES should set out the approach adopted for the assessment and efforts should be made to agree these with consultation bodies, where relevant.
157	16.10.111	Additional factors to determine significance	The Inspectorate considers that the scope of assessment identifies the factors relevant to determine significance of noise effects, however the weight given to each of these factors in making a final determination of significance is unclear. In order to allow a transparent understanding of the assessment conclusions, as far as it is possible, the ES should provide a simple description of how each factor has influenced the assessment of the significant effects identified.
158	16.10.118	These additional metrics could be used to support and refine the identification of likely significant	This statement creates uncertainty in the proposed approach to assessment of significance. The ES should be specific regarding the factors that have been used to determine significance.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
		effects…	
159	16.10.127	Flight paths design	The Inspectorate acknowledges that flight path design cannot be fixed by the DCO and that detailed flight path evaluation will be considered as part of the Airspace Change Process (ACP). The ES should provide an indication of the level of certainty attached to the aircraft noise, recognising that flight paths are relatively fixed close to landing and take-off but are subject to increasing uncertainty with distance from the relevant runway.
160	Table 16.10	50dB $L_{Aeq,\ 16hour}$ daytime criteria for hospitals	The Inspectorate considers that the further justification is required for the use of a 50dB $L_{Aeq,\ 16hour}$ outdoor criterion rather than the indoor 30dB $L_{Aeq,16hour}$ criterion set out in the WHO Community Noise Guidelines. Efforts should be made to agree the criteria with the relevant local authority Environmental Health Officers. It is also unclear why cross reference 30 is used to justify the use of this criterion, since it relates to the construction vibration standard BS5228-2.
161	Table 16.10	50dB $L_{Aeq,\ 16hour}$ daytime criteria for schools	The Inspectorate considers that further justification should be provided for use of the 16 hour reference time interval for schools rather than the school day, consistent with the WHO Community Noise Guidelines.
162	Table 16.10	55dB $L_{Aeq,\ 16hour}$ external amenity space screening criteria	The WHO Community Noise Guidelines state that 55dB $L_{Aeq,\ 16hour}$ is the threshold of serious annoyance for outdoor living areas. Further justification should be provided in the ES to explain why the more conservative 50 dB $L_{Aeq,\ 16hour}$ moderate annoyance threshold has not been identified as a screening threshold for inclusion of receptors within the assessment.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
163	Graphic 16.4	Temporary construction impacts	The ES should define the term 'temporary' in light of the potential long duration of predicted construction sites and activities.
164	16.10.142	'a large noise change'	This paragraph cross references to Table 16.8, which uses the terms slight, minor, moderate and major to describe magnitude of change criteria. The ES should apply consistent terminology for the magnitude of change descriptors.
165	16.10.148	'design of the receptor'	The ES should set out the relevant design feature criteria used to inform 'additional factor #2'.
166	16.10.155	Additional metrics in line…	The relevant cross reference is missing, making the intent of the statement unclear.
167	Table 16.11	Peak Particle Velocity (PPV) criteria for vibration damage to buildings.	The criteria are stated to be derived from BS7385-2, however the criteria for transient vibration set out in the standard identify that the risk of cosmetic damage to residential buildings starts at a PPV of 15 millimetres per second (mm/s) at 4 hertz (Hz). The standard also notes that below 12.5 mm/s PPV, the risk of damage tends to zero. The ES should provide further justification for the proposed criteria, including reference to frequency dependent effects, where relevant.
168	16.11	Mitigation	The proposed noise insulation offer should be described within the ES. Details should be provided of the terms and conditions of uptake to demonstrate the deliverability of such a scheme and therefore the certainty to be placed on such mitigation.
169	Appendix 16.2	Noise Expert Review Group (NERG)	The status of outputs produced by the NERG is unclear. The Inspectorate recommends that any recommendations regarding

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			the scope and methodological approach made by the NERG are documented within the Applicant's ES.

4.13 Traffic and Transport

(Scoping Report Chapter 17)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
170	n/a	n/a	No matters have been proposed to be scoped out of the assessment, however the matters to be considered in Table 4.6 does not list an assessment of vehicular traffic within the operational airport and it is unclear whether this matter is considered within the air quality assessment. For the avoidance of doubt, the Inspectorate considers that sufficient information should be provided regarding operational traffic movements within the airport to enable an assessment of future air quality emissions to be undertaken.
ID	**Para**	**Other points**	**Inspectorate's comments**
171	17.1.10 and Table 17.2	Transport consultees and working groups	The Scoping Report identifies numerous transport consultees including Transport for London (TfL), the Heathrow Airport Transport Forum (HATF), the Technical Working Groups (TWGs), HSPG transport subgroup, Heathrow Area Transport Forum (which includes four working groups) and the Heathrow Highways Steering Group (HHSG). For clarity, the ES should include a description of the relative roles, functions and hierarchy of these groups in order to allow transparent understanding of the decision making framework for transport related matters. Any agreements reached with relevant consultation bodies regarding the methodological approach should be documented in the ES, where possible. It is unclear from Table 17.2 what consultation has been undertaken with Network Rail in relation to the assessment of

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			effects on the rail network. The list of stakeholders should also include Royal Mail in consideration of the potential effects of the Proposed Development on Royal Mail operations within the Heathrow area.
172	Figure 17.1	Error in boundary	To the east of Richmond the Rest of Fully Modelled Area boundary curves inwards and back along the Area of Detailed Modelling boundary. The figure should show two distinct polygons. The final study area boundaries should be clearly set out in the ES.
173	Figure 17.2	Clarity of text	The resolution of text is poor. The ES should ensure that all figures are clearly legible.
174	17.1.11	Best practice guidance	The Scoping Report refers to use of best practice guidance but does not set out what best practice guidance will be adopted. The Inspectorate recommends that the ES has regard to TfL best practice guidance on Transport Assessment, healthy streets, the promotion of active travel and constructions logistics.
175	Table 17.1	Department for Transport (DfT) Circular 02/2013: The strategic road network and the delivery of sustainable development	The ES should demonstrate how the DfT circular relating to the appraisal of development proposals affecting the strategic road network has been taken into account.
176	17.4.2	Heathrow Highway Assignment Surface Access Model (HHASAM)	The ES should fully justify the use of a dedicated highway model for Heathrow instead of existing standardised models for the Greater London Area. Efforts should be made to agree the modelling approach with relevant consultation bodies. The assessment should take into account the influence of

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			technology such as satnav, in the assignment of trips.
177	17.4.5	140mmpa	This figure is inconsistent with the predicted 130 mppa described in paragraph 1.2 of the scoping report. The ES should use consistent assumptions and assess the likely worst case increase in passenger numbers.
178	17.4.9	Railplan modelling	The extent of the Railplan model, data and validation should be agreed with TfL and other stakeholders where possible.
179	17.4.5 17.9.18	Threshold of change defining study area boundary	Paragraph 17.4.5 states that a 5% change in peak hour traffic flows threshold will be used to define the initial study area boundary, whereas paragraph 17.9.18 suggests that the study area will be defined using a 10% change in flows prior to considering whether locations are sensitive. The two approaches would likely give rise to substantially different study areas. Care should be taken when considering whether to assess links since a 1% increase on a congested network may have a significant effect, compared with a 10% increase in traffic on a lightly trafficked road. Robust justification should be provided for any links to be excluded/included within the assessment.
180	17.4.13	Study area evolution	The Scoping Report suggests that the study area may be subject to further evolution. The ES should explain any departure from the proposed criteria for definition of the traffic and transport study area set out in the Scoping Report. The study area should include areas currently affected by on street parking by private hire vehicles.
181	17.6.5	Bus datasets	The baseline dataset for assessment of bus routes should

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			incorporate TfL's iBus data, where relevant.
182	Table 17.3	Movement of materials to and from site during construction	Table 17.3 identifies that movement of materials to and from site will be for HGV movements. The ES should also consider the potential for significant effects from light duty vehicle (LDV) deliveries. The ES should also give consideration to the effects arising from increased material movement by other transport modes eg rail and water, where relevant. The potential for abnormal load deliveries is not discussed within the Scoping Report and should be addressed within the assessment.
183	Table 17.3	Movement of people (colleagues)	The definition of 'colleagues' is unclear. The assessment scope should include all maintenance workers, cargo industry workers, those in service industries, offices, hotels and supply chain companies as well as direct Heathrow and airline employees.
184	17.9.3 - 17.9.5	Site observations	Baseline data will be supplemented by 'site observations'. No detail of the proposed site observation scope or methodological approach is provided. Baseline data used to supplement the traffic and transport assessment should be collected in accordance with relevant standards and guidance.
185	17.9.4	Cycling	TfL states that the cycling network model for London 'Cynemon' should be used to assess the impacts of the scheme on cycling. The Applicant should seek to agree the proposed cycling model with the relevant consultation bodies and explain any departures from standardised models, where relevant.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
186	17.9.25	5km/hour criteria	In accordance with DMRB, allowance should be made for different walking speed criteria for vulnerable groups.
187	17.10	Mitigation	The assessment in the ES should have regard to TfL guidance on construction logistics and the protection of infrastructure. Construction traffic routes should be agreed with the relevant local planning authorities where possible.
188	Appendix 17.1 para 1.6.7	Passenger forecasts and scenarios for the number of colleagues	The ES should provide details of all assumptions used to underpin the passenger forecasts and colleague number scenarios, including any consultation regarding those assumptions. The Applicant should make efforts to agree the passenger forecast projections used in the ES with relevant consultation bodies.

4.14 Water Environment

(Scoping Report Chapter 18)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
189	Table 18.9, 18.6.32, Table 18.11	Activities described in Table 18.7 – Tidal flood risk	Risk of tidal flooding to and from the DCO project is ruled out in Table 18.9. Paragraph 18.6.32 makes no reference to the increased risk of tidal flooding elsewhere due to the project and Table 18.11 states that the flood risk assessment will cover all sources of flood risk including tidal. The Inspectorate does not agree that this matter can be scoped out because the Scoping Report lacks a robust justification and does not quantify the discharges from the Proposed Development. The Applicant should make efforts to agree the need for a tidal flood risk assessment with the relevant consultation bodies.
190	Appendix 18.3, Table 18.3.1	Groundwater dewatering Mobile treatment plant (dewatering) Mobile treatment plant (sewage)	Table 18.3.1 identifies a number of matters that could be scoped out of the groundwater modelling. These matters are not identified as scoped out within section 18.8 of the Scoping Report. In the absence of justification within the main Scoping Report, these matters are not scoped out.
191	Appendix 18.3, Table 18.3.1	Portable toilet facilities	The Inspectorate considers that assessment of such facilities during construction may be scoped out from further assessment on the basis that a discharge is not required.
192	Appendix 18.3, 3.6.3	No accretion or detailed groundwater surveys are planned for the Crane/Thames catchments.	The Applicant should ensure that the assessment in the ES is underpinned by sufficient baseline survey information. Effort should be made to agree the need for more detailed baseline survey information with relevant consultation bodies. If no further survey effort is conducted the ES should include a robust

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			justification support the exclusion of such surveys from the identified catchments.
ID	**Para**	**Other points**	**Inspectorate's comments**
193	Table 4.6	Increased sediment loading to surface water (construction only)	Due to the proposed increase in impermeable area during operation, the Inspectorate considers that increased sediment loading to surface water during operation could result in a likely significant effect and should be assessed.
194	Table 18.3	Groundwater study area	The study area is defined only with respect to the Lower Thames Gravels WFD groundwater body. Paragraph 14.4 of the land quality chapter identifies the potential for effects on the underlying chalk aquifer to arise from construction works including basements or piled foundations that extend below the base of the London Clay and Table 18.7 and Appendix 18.2 highlight the need to consider effects on the Cretaceous chalk aquifer. The Applicant should ensure that the extent of the model is sufficient to address effects on all aquifers likely to be affected.
195	Table 18.4 Table 18.10	Baseline data	The Inspectorate considers that further justification is required for the additional surveys to be undertaken. Currently the listed surveys lack detail regarding their extent, timing, duration, detailed methodology or reference to recognised survey standards. In light of the Environment Agency's comments in relation to the lack of flow gauging and monitoring, particular consideration should be given to justifying any flow monitoring surveys. Effort should be made to agree the detailed scope of surveys with the relevant consultation bodies eg. Environment Agency and Lead Local Flood Authorities.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			The baseline data should include Local Authority data regarding the extent of functional floodplains and from the Catchment Data Explorer, strategic flood risk assessments and relevant water quality assessments (for example as referenced in the South Bucks, Buckinghamshire and Surrey CC responses).
196	Table 18.8	Change in land use and river diversion activity	The receptor WE10: Upper River Colne should be included in the change in land use and river diversion and linked effect changes to channel morphology in operation, where relevant.
197	18.9.10	Assessment scenarios	The ES should also consider the potential for likely significant water quality effects to arise during the early ATM uplift scenario due to increased pollutant deposition due to increased aircraft and ground vehicle activity.
198	Table 18.14 and Table 18.5	Receptor sensitivity and magnitude of effect criteria	Whilst there is no industry standard methodological approach to undertake water environment assessments, the Scoping Report makes no reference to existing methodological approaches that are commonly used to assess water environment effects. The source of the proposed sensitivity and magnitude criteria are not set out in Table 18.14 and Table 18.15, although they appear to be loosely based on DMRB Volume 11 Section 3 HD45/09 Road Drainage and the Water Environment (or WebTAG) and Table 18.2 makes reference to DMRB requirements. The criteria reference designated areas but do not reference specific ecological elements of affected waterbodies (eg fish) that contribute to the sensitivity of the waterbodies. The Inspectorate recommends that effort is made to agree the elements to be considered as part of the criteria with the relevant consultation bodies.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
199	18.10.9 5.10	'Possible' plans	The draft CoCP is referenced as an example of a 'possible' plan, whereas section 5.10 of the Scoping Report states that a draft CoCP will be produced. The Inspectorate expects a draft CoCP to be submitted as part of the ES. The applicability of the CoCP to deliver environmental management of maintenance activities should be considered. The Inspectorate expects the ES to contain details of the proposed operational drainage strategy, in order to understand the potential effects of the development on the water environment and the effectiveness of any mitigation proposed.
200	Appendix 18.1	Water Framework Directive (WFD) derogation	The appendices refer to the potential need for derogation under the WFD, with specific reference to Article 4.7 of the WFD. Any requirements under Articles 4.8 and 4.9 of the WFD should also be considered and addressed through the assessment.
201	Appendix 18.1, 5.2.3	Thames River Basin Management Plan (RBMP)	The interim WFD objectives for the Thames RBMP, which are due to be released in 2019, should be used to inform the ES and WFD assessment where relevant.
202	Appendix 18.1, 6.1.12	Water bodies currently attaining good status will not be subject to screening for effects on the achievement of WFD status objectives, as they are already at target status.	The screening assessment should take into account the interim WFD objectives for the Thames RBMP in case of changes in the status of waterbodies subject to assessment.
203	Appendix 18.1, 7.2.3	Temporary effects	The assessment relies on the European Commission, Common Implementation Strategy for the Water Framework Directive

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			(2000/60/EC), Guidance Document No. 20, 2009 and states that impacts are considered to be temporary, and therefore not to constitute deterioration of WFD status if the water body would "*Recover without the need for any mitigation*". The EC guidance actually uses the term "restoration" rather than mitigation. The ES should ensure consistent use of terminology between assessments and guidance. The duration of temporary effects should be fully defined.
204	Appendix 18.1-18.3	Climate change	Limited reference is made within the surface and groundwater modelling appendices to climate change. The ES should ensure that the modelling process takes account of future climate change scenarios and clearly cross references to the findings of the climate and climate change assessment.
205	Appendix 18.4, 6.2.2	Pluvial flood risk	Paragraph 6.2.2 suggests that existing publicly available Environment Agency surface water flood risk mapping will be sufficient to inform the flood risk assessment but that modelling may also be required. Efforts should be made to agree the requirement for pluvial flood risk modelling with the relevant consultation bodies e.g. Environment Agency and Lead Local Flood Authorities.
206	n/a	Canal and River Trust	If during design development the Proposed Development approaches within 100m of a relevant waterway, the Canal and River Trust, should be consulted.

4.15 Waste Impact Assessment

(Scoping Report Section 4.4 and Appendix 4.1)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
207	4.4.1, Table 4.5 and Appendix 4.1	Waste as a separate topic chapter	The Scoping Report proposes to consider waste '*as part of the appropriate environmental topics and associated strategies*'. Table 4.5 cross references to aspect chapters that would consider waste related effects such as air quality and transport. The Scoping Report is somewhat confusing in providing a stand-alone assessment methodology including significance criteria for capacity impacts in Appendix 4.1 but not identifying where in the ES such an assessment would be provided. The Inspectorate considers that this should be provided as a stand-alone aspect chapter. The ES must include an assessment of effects on waste capacity, in particular addressing the reduction in waste treatment capacity caused by the loss of the Lakeside Energy from Waste Plant, including any contingency measures that would be required should it not be possible to relocate the facility. The waste assessment must demonstrate that the Applicant has proposed an effective process that will be followed to ensure effective management of hazardous and non-hazardous waste arising from all phases of the lifetime of the Proposed Development; that the types of waste produced during construction and operation are quantified; and any likely significant effects arising from the disposal and recovery of waste have been identified. The consultation responses incorporate baseline data relevant to

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
			the assessment of waste impacts (eg Surrey CC), the Inspectorate advises that such data should be taken into account within the assessment to be presented in the ES.
208	Appendix 4.1, 1.6.6	Hazardous, inert and liquid Controlled Wastes during operation will not be considered.	The potential volume of hazardous, inert and liquid Controlled Wastes should be quantified and their disposal methods identified including confiscated liquids and liquid wastes generated during aircraft maintenance.
ID	**Para**	**Other points**	**Inspectorate's comments**
209	Section 4.4, Table 4.5	Resource Management Plan	Mitigation and enhancement for waste and resources management during construction is proposed to be set out in an overall CoCP, Resource Management Plan and contractor site waste management plans. A draft of the relevant plans used to inform the assessment including the Resource Management Plan should be provided as part of the ES.
210	Appendix 4.1, 1.2.10	Assessment area	For the construction phase, waste and material resources shall be assessed based on the boundary of the DCO Project having regard to the South East and London regional areas. The spatial scope should not be drawn so wide that the assessment of effects on existing and future waste capacity is underrepresented.
211	Appendix 4.1, 1.2.12	30 minute drive time assumption	Efforts should be made to agree the assumption of a 30 minute drive time with the relevant highways authority during development of the transport model. Justification should be provided for all such assumptions made in relation to disposal eg application of the proximity principle for disposal of waste.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
212	Appendix 4.1, 1.4.11	5.5 day working week	A 5.5 day working week is currently assumed to forecast waste generation rates from worker accommodation. Forecasts should be kept under review to allow for other patterns of working that may be identified as necessary for delivery of the Proposed Development.
213	Appendix 4.1, Tables 1.4.1-1.4.3	Significance criteria	The significance criteria set out in Appendix 4.1 are based on thresholds in the now withdrawn circular 02/99. The Applicant should consider the use of threshold criteria adopted by waste planning authorities within the South West as highlighted in Buckinghamshire CC's consultation response. The ES should justify the suitability of the criteria adopted.

4.16 Cumulative Effects Assessment

(Scoping Report Section 4.6 and Appendix 4.2)

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
214	Appendix 4.2, 3.2.13	Effects on local plan development	The Scoping Report states that 'Given the lack of published information and the inherent uncertainty as to the delivery of developments referred to in development plans, it is not considered possible to take such developments into account in the CEA'. The Inspectorate considers that the CEA should follow the advice set out in Advice Note 17: Cumulative Effects Assessment (AN17) and include an assessment in relation to local plans.
ID	**Para**	**Other points**	**Inspectorate's comments**
215	4.6.6	5 year exclusion criteria	The use of a 'planning applications submitted and consented/ pending determination in the last 5 years' exclusion criteria may exclude some very large and complex developments from consideration as part of the cumulative effects assessment. Justification for exclusion of such projects should be provided.
216	Appendix 3.2 of Appendix 4.2	Table 3.2.1	The Inspectorate notes that the Scoping Report proposes to adopt the Mayor of London's call-in criteria for the purposes of screening Tier 1 development. These criteria only relate to development within the Greater London Authority administrative area. Outside this area, powers available under the Town and Country Planning Act 1990 may be more appropriate. In addition, the Scoping Report proposes to use criteria set out in Schedule 2 of the Town and Country Planning (EIA) Regulations 2017. The Inspectorate suggests that Schedule 1 criteria should also be applied.

ID	Ref	Applicant's proposed matters to scope out	Inspectorate's comments
217	Appendix 3.4 of Appendix 4.2	Initial schedule of other developments	The list of developments considered should include the prospective Southampton to London Pipeline NSIP and Southern Rail project, where relevant. The ES should also have regard to the list of permitted and proposed minerals and waste developments identified by Buckinghamshire CC and Surrey CC.
218	Appendix 4.2, 3.4.1	Freeze date approximately 6 months prior to the DCO application being submitted	As set out in the AN17, where new 'other development' comes forward following the stated assessment cut-off date, the Examining Authority may request additional information during the examination in relation to effects arising from such development. The applicant should be aware of the potential need to conduct further assessments and provide more information.
219	Appendix 4.2, 3.5.2	Significance of cumulative effects	The Scoping Report states that '*the same significance criteria will be used in relation to each topic as are used for their core assessment, considering whether the cumulative effects would have a higher level of significance than that identified in core assessments*.' This suggests that a purely additive approach to cumulative effects is proposed. The ES should ensure that any synergistic cumulative effects are also identified, where relevant.

5. INFORMATION SOURCES

5.0.1 The Inspectorate's National Infrastructure Planning website includes links to a range of advice regarding the making of applications and environmental procedures, these include:

- Pre-application prospectus[6]
- Planning Inspectorate advice notes[7]:
  - Advice Note Three: EIA Notification and Consultation;
  - Advice Note Four: Section 52: Obtaining information about interests in land (Planning Act 2008);
  - Advice Note Five: Section 53: Rights of Entry (Planning Act 2008);
  - Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements;
  - Advice Note Nine: Using the 'Rochdale Envelope';
  - Advice Note Ten: Habitat Regulations Assessment relevant to nationally significant infrastructure projects (includes discussion of Evidence Plan process);
  - Advice Note Twelve: Transboundary Impacts;
  - Advice Note Seventeen: Cumulative Effects Assessment; and
  - Advice Note Eighteen: The Water Framework Directive.

5.0.2 Applicants are also advised to review the list of information required to be submitted within an application for Development as set out in The Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009.

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[6] The Planning Inspectorate's pre-application services for applicants. Available from: https://infrastructure.planninginspectorate.gov.uk/application-process/pre-application-service-for-applicants/

[7] The Planning Inspectorate's series of advice notes in relation to the Planning Act 2008 process. Available from: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/

APPENDIX 1: CONSULTATION BODIES FORMALLY CONSULTED

TABLE A1: PRESCRIBED CONSULTATION BODIES[8]

SCHEDULE 1 DESCRIPTION	ORGANISATION
The Health and Safety Executive	Health and Safety Executive
The National Health Service Commissioning Board	NHS England
The relevant Clinical Commissioning Group	NHS North West Surrey Clinical Commissioning Group
	NHS Slough Clinical Commissioning Group
	NHS Windsor, Ascot and Maidenhead Clinical Commissioning Group
	NHS Chiltern Clinical Commissioning Group
	NHS Hillingdon Clinical Commissioning Group
	NHS Hounslow Clinical Commissioning Group
Natural England	Natural England
The Historic Buildings and Monuments Commission for England	Historic England - London Gt London
The relevant fire and rescue authority	Royal Berkshire Fire and Rescue
	Surrey Fire and Rescue Services Headquarters
	Buckinghamshire Fire and Rescue Service

[8] Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (the 'APFP Regulations')

SCHEDULE 1 DESCRIPTION	ORGANISATION
	London Fire Brigade
The relevant police and crime commissioner	Surrey Police and Crime Commissioner
	Metropolitan Police and Crime Commissioner
	Thames Valley Police and Crime Commissioner
The relevant parish council(s) or, where the application relates to land [in] Wales or Scotland, the relevant community council	Colnbrook with Poyle Parish Council
	Old Windsor Parish Council
	Wraysbury Parish Council
	Horton Parish Council
	Datchet Parish Council
	Iver Parish Council
	Denham Parish Council
The Environment Agency	The Environment Agency - Hertfordshire & North London
	The Environment Agency – Thames
The Civil Aviation Authority	Civil Aviation Authority
The Relevant Highways Authority	Surrey County Council
	Slough Borough Council
	London Borough of Hillingdon
	London Borough of Hounslow
	Royal Borough of Windsor and Maidenhead
	Buckinghamshire County Council
The relevant strategic highways company	Highways England - South East
Transport for London	Transport for London

SCHEDULE 1 DESCRIPTION	ORGANISATION
The Canal and River Trust	The Canal and River Trust
Public Health England, an executive agency of the Department of Health	Public Health England
The Crown Estate Commissioners	The Crown Estate
The Forestry Commission	Forestry Commission - South East and London
The Secretary of State for Defence	Ministry of Defence

TABLE A2: RELEVANT STATUTORY UNDERTAKERS[9]

STATUTORY UNDERTAKER	ORGANISATION
The National Health Service Commissioning Board	NHS England
The relevant NHS Trust	London Ambulance Service NHS Trust
The relevant NHS Foundation Trust	South East Coast Ambulance Service NHS Foundation Trust
	South Central Ambulance Service NHS Foundation Trust
Railways	Network Rail Infrastructure Ltd
	Highways England Historical Railways Estate
Road Transport	Transport for London
Canal Or Inland Navigation Authorities	The Canal and River Trust
Civil Aviation Authority	Civil Aviation Authority
Licence Holder (Chapter 1 Of Part 1 Of Transport Act 2000)	NATS En-Route Safeguarding

[9] 'Statutory Undertaker' is defined in the APFP Regulations as having the same meaning as in Section 127 of the Planning Act 2008

STATUTORY UNDERTAKER	ORGANISATION
Universal Service Provider	Royal Mail Group
Homes and Communities Agency	Homes England
The relevant Environment Agency	Environment Agency - Hertfordshire and North London
The relevant water and sewage undertaker	Affinity Water (Southeast region)
	Thames Water
The relevant public gas transporter	Cadent Gas Limited
	Energetics Gas Limited
	Energy Assets Pipelines Limited
	ES Pipelines Ltd
	ESP Connections Ltd
	ESP Networks Ltd
	ESP Pipelines Ltd
	Fulcrum Pipelines Limited
	GTC Pipelines Limited
	Independent Pipelines Limited
	Indigo Pipelines Limited
	Quadrant Pipelines Limited
	National Grid Gas Plc
	Scotland Gas Networks Plc
The relevant electricity distributor with CPO Powers	Energetics Electricity Limited
	Energy Assets Networks Limited
	Energy Assets Power Networks Limited
	ESP Electricity Limited
	Fulcrum Electricity Assets Limited

STATUTORY UNDERTAKER	ORGANISATION
	G2 Energy IDNO Limited
	Harlaxton Energy Networks Limited
	Independent Power Networks Limited
	Leep Electricity Networks Limited
	Murphy Power Distribution Limited
	The Electricity Network Company Limited
	UK Power Distribution Limited
	Utility Assets Limited
	Vattenfall Networks Limited
	Utility Distribution Networks Limited
	UK Power Networks Limited
	National Grid Electricity Transmission Plc

TABLE A3: SECTION 43 CONSULTEES (FOR THE PURPOSES OF SECTION 42(1)(B))[10]

LOCAL AUTHORITY[11]
Wycombe District Council
Surrey Heath District Council
Runnymede District Council
Elmbridge District Council
Spelthorne District Council

[10] Sections 43 and 42(B) of the PA2008

[11] As defined in Section 43(3) of the PA2008

LOCAL AUTHORITY[11]
South Bucks District Council
Chiltern District Council
Three Rivers District Council
Slough (Borough Council
Royal Borough of Windsor and Maidenhead
Wokingham Borough Council
London Borough of Richmond upon Thames
London Borough of Hammersmith and Fulham
London Borough of Hounslow
London Borough of Ealing
London Borough of Hillingdon
Bracknell Forest Borough Council
London Borough of Harrow
Buckinghamshire County Council
Hertfordshire County Council
Surrey County Council
South Downs National Park Authority
London Borough of Kingston upon Thames
Milton Keynes Council
London Borough of Sutton
London Borough of Croydon
London Borough of Bromley
Central Bedfordshire Council
Kent County Council
Northamptonshire County Council

LOCAL AUTHORITY[11]
Oxfordshire County Council
West Sussex County Council
East Sussex County Council
Hampshire County Council

THE GREATER LONDON AUTHORITY

ORGANISATION
The Greater London Authority

TABLE A4: NON-PRESCRIBED CONSULTATION BODIES

ORGANISATION
N/A

APPENDIX 2: RESPONDENTS TO CONSULTATION AND COPIES OF REPLIES

Consultation bodies who replied by the statutory deadline:

Affinity Water Limited
Buckinghamshire County Council*
Buckinghamshire Fire and Rescue Service
Cadent Gas Limited
The Canal and River Trust
Central Bedfordshire Council
Civil Aviation Authority
Datchet Parish Council
Ealing Council*
The Environment Agency
ESP Utilities Group Ltd
Forestry Commission
Health and Safety Executive
Highways England
Hillingdon Clinical Commissioning Group
Historic England
Horton Parish Council
London Borough of Hammersmith and Fulham
London Borough of Hillingdon
London Borough of Hounslow*
Ministry of Defence
National Grid
NATS

Natural England
Network Rail
Public Health England
Royal Borough of Kingston upon Thames*
Royal Borough of Windsor and Maidenhead*
Royal Mail
Runnymede Borough Council*
Slough Borough Council*
South Bucks District Council and Chiltern District Council*
Spelthorne Borough Council*
Surrey County Council*
Transport for London
West Sussex County Council
Wraysbury Parish Council

*Consultation response includes or comprises the joint response prepared by Heathrow Strategic Planning Group (HSPG).

Affinity Water Limited
Tamblin Way
Hatfield
Hertfordshire
AL10 9EZ
Direct Tel: 01707 268111

patrick.campbell@affinitywater.co.uk

The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN.

Our ref: 138 of 2018. SMM

POST and EMAIL

Your ref: TR020003/Affinity Water

19 June 2018

Dear Sir/Madam,

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the "EIA Regulations") Regulations 10 and 11

Application by Heathrow Airport Limited (the "Applicant") for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the "Proposed Development")

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

We refer to your letter of 22 May 2018. This letter was sent to a regional office of Affinity Water Limited rather than that of our head office in Hatfield, which caused some lost time within our organisation to respond. Please can future correspondence be addressed to the registered office address and reference in this letter. Please can this be marked for my attention and Sean McGuigan within the Legal Team.

Affinity Water is appointed as a water undertaker under the Water Industry Act 1991; it provides drinking water to approximately 3.6 million customers in parts of North London and the Home Counties together with customers in the Dover and Folkestone and East Tendring area.

We have a statutory duty under section 37 of the Water Industry Act 1991 to develop and maintain an efficient and economical system of water supply and to ensure that all such arrangements have been made for providing supplies of water and for maintaining, improving and extending our water mains and other pipes.

The "Proposed Development" is located within our Central region, which extends from Guildford in Surrey to Saffron Walden in Essex, much of Hertfordshire and Buckinghamshire and north and west London including the area around Heathrow Airport. Around 60% of the water we supply to customers in our Central region is abstracted from groundwater sources. The remaining 40% of the water we provide to our customers is abstracted from the River Thames and treated at four water treatment works, one of which is our Iver water treatment works that is located approximately 4.25km from Heathrow Airport.

We have reviewed the request for a Scoping Opinion. We appreciate that the Planning Inspectorate has a statutory timetable to meet in issue its Scoping Opinion, but the time available has meant that we have not been able to give the issues raised in this request detailed consideration. We will be writing further directly to the Applicant in due course to discuss the Proposed Development in relation to the time, costs and resources needed to properly deal with this matter.

We have had preliminary discussions with the Applicant to the extent that we have been advised in general terms of the likely footprint of the Proposed Development and the possible effects it may have on our undertaking. These preliminary discussions indicate that overall water demand from the expanded airport will not increase significantly as water saving measures will be introduced across the airport. Diversions and other network related work will need to be made in relation to our existing and extensive network of water mains, service pipes, equipment, operational apparatus and accessories within the Proposed Development.

We have identified the following points of sensitivity and potential concern based on our preliminary review of the documents provided.

- We have major strategic pipelines that will be within the Proposed Development including a 450mm diameter trunk water main that will be directly affected.

- We have smaller distribution pipelines and service pipes that are in the Proposed Development that will be directly affected.

- We manage and control leakage and pressure to customers across leakage zones that are well understood; the reconfiguration of our network is likely to impact on this management.

- We anticipate there may be impacts on network resilience arising from the Proposed Development. We currently have multiple ways of providing water to household and non-household properties using different pipes and the number of options available to us could be reduced. This impact could extend 3-4km outside of the Proposed Development.

- The western edge of the Proposed Development impinges on Iver Water Tunnels. Iver Raw Water Tunnel No. 1 carries raw water from our abstraction point on the River Thames at Sunnymeads to Iver WTW. Iver Raw Water Tunnel No. 2 is an emergency link that carries water from Wraysbury Reservoir to Iver and is used if for operational reasons we are unable to abstract from River Thames at our own intake at Sunnymeads. The Proposed Development could impact on these tunnel structures in a number of ways:

    - The Proposed Development may increase the loading transmitted onto the tunnel, which could damage the structure or lead to increase deterioration of the fabric of the tunnel.

- Construction of runway may require excavation over the tunnel; removing the overburden above the tunnel could impact its structural integrity.

- The ongoing presence of the Proposed Development over the tunnel will create significant access issues over the tunnel that will need to be resolved.

- We have concerns that the Proposed Development could exacerbate the risk of contamination of the water quality at our surface water abstractions. This is due to the multiple landfills located in the vicinity which have the potential to create new pollutant pathways and potential turbidity related issues triggered by the proposed construction works.

- We also have concerns that the proposed river channel modifications could change the hydraulics between the associated rivers and lakes which are currently used for emergency supply.

- We would also be interested in the determination of the downstream impacts on flows in the rivers during extreme events such as drought and flood risk. The proposed changes to the baseflow of the rivers have the potential to affect the water quality at our surface water abstractions and could impact our ability to respond in the event of a pollution incident.

Please note this cannot be a fully comprehensive list because we have not yet seen the full detail of the Applicant's Proposed Development and we anticipate that we may identify additional concerns.

If you have any queries regarding our response please do not hesitate to contact me.

Yours faithfully



Patrick Campbell
Head of Infrastructure Strategy
Affinity Water Limited

Cabinet Member for Planning & Environment

Bill Chapple OBE

Buckinghamshire County Council
County Hall, Walton Street
Aylesbury, Buckinghamshire HP20 1UA

Telephone 0845 3708090
www.buckscc.gov.uk

Submitted by email:
HeathrowAirport@pins.gsi.gov.uk

Date: 18 June 2018
Ref: TR020003

Heathrow Expansion – Scoping Consultation

Buckinghamshire County Council (BCC) welcomes the opportunity as a statutory consultation body for the prospective Development Consent Order (DCO) application to respond the request to The Planning Inspectorate (PINS) by Heathrow Airport Limited (HAL) for a Scoping Opinion, (the 'Scoping'). From previous meetings with the Heathrow team I understand that Buckinghamshire will be a 'host authority' for the DCO and a statutory consultee on the Airspace Change Process (ACP). In view of the current division of responsibilities in a two tier area, such as Buckinghamshire, we continue to work with our district colleagues including South Bucks District Council (SBDC) and countywide bodies such as Buckinghamshire Thames Valley LEP (BTVLEP) in considering expansion proposals.

BCC is also working with key partners, not least the Colne Valley Park Community Interest Company (CVP) to consider HAL's proposals, their impact and potential mitigation within Buckinghamshire, on the county's communities, businesses and environment. As the strategic authority in Buckinghamshire, BCC recognises the potential economic benefits that the expansion of Heathrow could bring to the county and the wider South East. From my and the Council Leader's discussions with the HAL team, I know that HAL recognise the increasing importance of surface connectivity through the county to the England's Economic Heartlands area for business and leisure passengers, as well as freight.

BCC was one of the first Councils to publicly support the growth of the airport, on the proviso that adverse economic, community and environmental impacts including noise, air quality and traffic are appropriately mitigated. I recognise the importance therefore in ensuring that HAL consider the impacts - including potential benefits - on our communities, businesses and environment within the geographic area of Buckinghamshire. It is important that at this early stage HAL does not scope out these interests and impacts without suitable assessment and the agreement of BCC in our statutory role.

Turning to the DCO proposal we understand from the consultation documents that:

- HAL now identifies one site for Airport Related Development at Thorney Sidings, Iver.
- HAL continues to identify sites for potential flood storage capacity including BCC land at Thorney Park and New Denham Quarry. Other land in southern Buckinghamshire is likely to be needed for ecology and landscape mitigation.
- HAL propose removing the cap on flight numbers in 2022, increasing passenger numbers and freight before new rail and coach/ bus capacity is available to serve a third runway.

- It is too early in the airspace change process (ACP) to know the flightpaths and the precise impacts of noise on residents and on Council service locations including Schools and Country Parks and the impact on service and park users.

Following the Council Leader's responses to Government consultations in 2017 and HAL's non statutory consultations (DCO and ACP) earlier this year, two key issues remain for Buckinghamshire.

Local impacts

Impacts around the Iver area in southern Buckinghamshire must be appropriately mitigated, including cumulative impacts arising from a number of national infrastructure schemes. These include the expansion of Heathrow Airport, HS2, Western Rail Link to Heathrow (WRLtH), Crossrail and the approved M4 & future M25 Smart Motorway Projects. The Ivers Area is unique in being subject to so much change and the Council continues to request that the Department for Transport (DfT) commits dedicated co-ordinating resources to support the alignment and joint programming of these nationally significant infrastructure projects to minimise the extended construction impacts and mitigate cumulative transport and environmental impacts on the local community. In view of the existing cumulative impacts, Green Belt protection and the potential harm to the landscape of the CVP, BCC supports the HAL proposal not to bring forward multiple airport related development sites in the Ivers area.

As a 'host' community for airport expansion and other major projects, we support the local aspiration for an Iver Relief Road to provide mitigation from construction traffic and to prevent the current HGV issue worsening leading to local congestion, air quality and health issues and road user safety concerns. The mitigation, which the Iver Relief Road would provide, has wide stakeholder support and is endorsed by Council Leaders and the three LEP's represented on the Heathrow Strategic Planning Group.

Aircraft Noise

On airspace and aircraft noise, BCC support the national modernisation programme. HAL's redesign of airspace has the potential to continue the airport's track record of reducing its noise footprint. Airspace modernisation alongside HAL's financial incentives for airlines to upgrade fleets can lower emissions with both air quality and carbon benefits.

Whilst consideration of detailed flight paths (Stage 3 of the ACP) is planned by HAL to follow the DCO process we note that a number of options could mean aircraft using the expanded airport and third runway after 2025 may overfly areas within southern Buckinghamshire that have not been previously overflown. From the CAA/ DfT and HAL consultation events over the past year you will have gathered from residents and elected members that the extended process for the ACP creates unnecessary uncertainty for those communities in the county.

New flightpaths could have a significant adverse impact on not just the quality of life of residents in the county but also have negative health impacts for residents, service users, business and workers in the newly affected areas. HAL's consultants have advised the BCC team that the effects on health for communities not previously overflown is greater than for communities already overflown and to an extent have become acclimatised to aircraft noise. Minimising the need to affect new populations and business should be the first principle in Heathrow's redesign of airspace. This principle can and should guide HAL's EIA noise assessment and mitigation design and would complement the reduction in the footprint of the noise envelope which Heathrow has achieved for communities already affected by noise. With regard to the Scoping, applying this 'minimise newly overflown' principle can in turn provide some certainty to communities during the DCO process that requirements and obligations set out in the Secretary of State's future DCO Order(s) will not be overturned by ACP or other CAA regulatory decisions. If new communities, businesses and services are to be affected in Buckinghamshire

then the area of that impact should be minimised through appropriate baseline work and design of envelopes so that residents have confidence in the current noise assessment and that HAL will keep them informed of monitoring and changes to impacts during the DCO process, construction and then operation. This includes respite from noise for predictable periods which should be applied equally across all affected populations.

As the Lead member for Heathrow, and working with Cabinet colleagues for transport and public health in Buckinghamshire, I want to highlight two opportunities which Heathrow's first consultation - and on which the Scoping request is based - provides for the next stage in designing the airport, assessment and mitigation. Perhaps most importantly these can also assist in providing information to the residents on the current situation and future position on these issues and are areas where BCC have and will be seeking HAL commitments and HAL reporting in their Consultation Report.

- **Rail Surface Access**

Access from Buckinghamshire to Heathrow is usually by private car, as rail travel currently requires a journey into London, a number of connections and then back out to the airport. Many airport workers and travellers from Buckinghamshire to Heathrow therefore drive, in view of the proximity – if not journey time reliability – to Heathrow. Iver's position close to the airport, mean it is the location of many airport workers homes and given that there is no bus service to the airport many drive direct. This unnecessary traffic adds to congestion on the local road and motorway network. There are limited bus services to Heathrow from a number of the county's towns. Better public transport connectivity to Heathrow is needed throughout Buckinghamshire via hubs in our major towns. HAL's Transport Assessment and Surface Access Strategy should consider the current missing transport links and bring forward funded options to deliver local and sub regional connections and the links to those stations via sustainable transport modes.

We support HAL's objective of securing 'no net increase in traffic' to the expanded airport and recognise the important part that transport schemes within and connecting Buckinghamshire can play in delivering an airport which is accessible to more people by enhanced rail and public transport. BCC continues to advocate that HAL sign up to a 'triple lock' on surface access to an expanded airport which then enables capacity from a third runway to become operational when Heathrow demonstrates to local planning, transport and health authorities that :

1. Transport interventions including funding for new local bus and cycle routes for Heathrow workers and appropriate financial for support for WRLtH, for example, are delivering HAL's '**no net increase in traffic'** commitment.

2. Committed projects to enable passengers, workers, commuters and freight to move to more sustainable and accessible modes of travel, including links by rail and coach to High Wycombe and from other towns in Buckinghamshire will enable delivery on Heathrow's and the draft Airports National Policy Statement NPS **mode share targets** when new aircraft movement capacity is released.

3. **Air quality** requirements are and can continue to be delivered in and around Heathrow, including southern Buckinghamshire and that Heathrow's contribution to emissions does cause not worsening air quality and consequent health impacts in the Ivers area as a result of construction traffic from the multiple major projects or from displacement of road traffic on to local roads, for example when the M25, M4 and A4 are heavily congested. For Buckinghamshire, HAL must provide monitoring at locations which are near to the current air quality hotspots to the north and west of the airport. This is required to provide a baseline for residents and service users, for example at Country Parks, to show the current position and provide monitoring information which demonstrates HAL actions at the hotspots isn't simply displacing poor air quality to locations in the Ivers area.

Our expectation from the proposed expansion of Heathrow is that HAL will clearly set out what mitigation is required to address transport impacts - including through the Health Impact Assessment and Cumulative assessment – and how communities will be engaged in these options and when schemes will be delivered to mitigate impacts and/ or compensate the local community. Mitigation should first look to address impacts during construction, particularly at sensitive locations such as schools. On compensation, the guiding principle should be to put in place long lasting legacy projects with multiple benefits, such as investment in landscape along transport and river corridors including tree planting, flooding and ecology protection and public access enhancements within the Colne Valley Park.

- **New noise impacts**

The third runway means that the Dorney and Taplow communities would be directly under the east – west flight path of planes landing and taking off from the expanded airport. They are likely to be severely impacted in the mid- 2020s for the first time by aircraft noise when the third runway is operational. We are also concerned that increased aircraft noise from Heathrow will affect the tranquillity and rural experience of visitors and users of Black Park, Langley Park and Thorney Park. The Parks are regularly used by Pinewood Studies for filming and an increase in noise is likely to jeopardise the use of the Parks and so increase costs for Pinewood. This would significantly reduce income which supports the park's management and use by one million visitors a year.

We request HAL fund noise monitoring locations in Dorney, Taplow and at BCC service locations in the Ivers including schools and Country Parks to ensure that sufficient data is available for HAL, regulators and for residents and business to understand current noise levels and how potential changes approved under the DCO and ACP process may impact on health, particularly night time noise, and the use and enjoyment of public space in southern Buckinghamshire and the Colne Valley Park.

I and the BCC team look forward to continue working with PINs, the DCO Examiners and HAL to assist in making a robust decision and in explaining the Heathrow expansion plans to residents and business in the County and so ensure appropriate mitigation and benefits are felt by the local community. This may include a need to revisit the Scoping when HAL identify additional land in Buckinghamshire as part of design iteration and preferred mitigation. BCC therefore reserves its final position on Scoping to ensure that effects not currently set out in the HAL report are assessed following and agreed methodology. The BCC technical response to the Scoping is appended.

Yours sincerely,

[redacted]

Bill Chapple
Cabinet for Planning & Environment
Buckinghamshire County Council

cc:
Buckinghamshire's Members of Parliament
Bucks Planning Group
Colne Valley Park
Chilterns AONB
County Councillors
Iver Member Liaison Group
LEP Board Members
England's Economic Heartlands
Chiltern Railways
London Luton Airport Limited

Appendix One - BCC Technical Response

The BCC response follows the structure of the report submitted by HAL to PINS. The job title(s) in brackets denotes the position of the main technical lead for BCC on that topic.

1. Introduction

1. BCC's technical team have welcomed the Workshops offered by HAL to Councils, LEPs and Colne Valley Park officers setting out the Scoping process. One general comment is that the limited detail in HAL's Consultation one (Q1 2018) means that the Scoping Report although long is also relatively short on detail. As a consequence de scoping aspects of the Project now appears to be based on limited information (at least that visible to BCC). When considering cumulative aspects and the May 2017 EA Regulations the proposed areas of de scoping are highly likely to be required to be reintroduced to the assessment. For example, (Table 1 and Table 3.6) the use of land for flood storage in Bucks may preclude that land from being used for new employment or may aid adjacent/ up & down stream areas being used for job creation through betterment which removes a delivery obstacle. This impact scope not be de scoped at this stage & not be considered for de scope until the land for flood mitigation is more definitively identified by HAL.

2. BCC consider that 'local roads' (paragraph 1.1.2, line 3) are likely to include those in southern Buckinghamshire including the A4 and local roads from junctions off the motorway network. This is based on initial modelling by HAL as well previous DCO and non DCO schemes BCC has considered.

3. With reference to paragraph 1.2.3, BCC's submission to HAL'S Consultation One set out a triple lock on airport capacity coming forward including the need to meet air quality standards through investment in surface access capacity and connectivity. This is also a policy requirement in the draft ANPS laid before in early June 2018 (ANPS 1.37, 3.36, 3.38 and 5.9, for example, with the need to consult BCC as a highway and transport authority at ANPS 5.11).

4. HAL at Scoping paragraph 1.9.21 onwards should refer to statutory planning (minerals and waste) policy and transport policy which will be material considerations for those aspects of the DCO. This includes the adopted Buckinghamshire Minerals and Waste Core Strategy. The ES should also include our 'Saved' Minerals and Waste Local Plan policies, and the Minerals and Waste Core Strategy adopted in 2012. These form part of the statutory development plan.

2. Description

1. BCC notes that there is not reference to the Ivers villages (Richings Park, Iver and Iver Heath). BCC welcomes though the initial work by HAL to engage with these communities acknowledging that the Ivers will become near neighbours of expanded airport and that design iteration and mitigation is highly likely to include land with the Ivers community area of southern Buckinghamshire.

2. BCC supports the proposed night time ban on flights (paragraph 2.2.27) and would ask that HAL and PINs ensure that the ES Scope clarifies the respective roles and timing of the DCO decision, CAA economic regulation and the Airspace Change Process (ACP) and government in setting night time restrictions on Heathrow as a regulated airport.

3. DCO Project

1. BCC notes that the project is currently defined by the parameters and geographic area essentially drawn from the Davies Commission and HAL's Consultation One information

(Paragraph 3.2.1). HAL have confirmed, most recently in early June 2018 after the scoping request was submitted, that land and sites in Buckinghamshire will be required for flood capacity. Given the size of areas involved and opportunities flagged to HAL for other mitigation in the county, including land in BCC control, the redline and/ or areas required to be HAL control for the duration of construction and with access and revenue/ maintenance cost agreements in place will require the DCO project 'redline' to be drawn more widely. For the construction phase, and in view of rail and motorway access points the centroid for consideration of impacts across all topics will move significantly north including the Ivers area and potentially Denham and Stoke Poges.

2. BCC acknowledges and supports the process (paragraph 3.2.13) for development not in the DCO application to be brought forwards as part of the local plan making process. This follows NNPF principles for a 'plan led' planning system (NPPF, para.17)

3. BCC notes the potential extended period of construction to 2035 (3.4.12) and that whilst this may reduce the intensity of construction impacts on the Ivers area it would extend the duration of impacts which may then impact on sites cumulative construction impacts (HGVs etc) and the other development sites' phasing, as identified in the emerging South Bucks Local Plan.

4. BCC as transport authority supports the maximum use of rail for both construction materials and operational freight serving Heathrow (3.4.14), which then minimises HGV movements on local Buckinghamshire roads.

4. Scoping Approach

1. BCC is reassured by the confirmation from several different members of the HAL team, covering a number of topics at workshops in May and June 2018 setting out the Scoping approach, that the area to be assessed will increase as HAL confirm the inclusion of mitigation and associated works in land to the north of the M4 i.e. in southern Buckinghamshire. The nature of this work including flooding, access, recreation, archaeology and biodiversity will necessarily require the future agreement with BCC as either the statutory body or the local authority hosting the local topic experts on behalf of other councils and groups to the scope and methodology the EA for this land and works.

2. BCC reiterates that the number of projects in and around Iver, with their attendant HGV impacts requires cumulative assessment by HAL. With reference to Future Baseline (4.3.5(2)), first phase capacity (4.3.5(3)) and Year of maximum construction effects (4.3.5(4)) BCC requests that HAL assess the impact of an uplift in ATM with the increasing size/ load factor of aircraft and freight growth to ensure that traffic impacts and resultant air quality effects are not pushed into southern Buckinghamshire, as a consequence of surface access capacity not being in operation to enable an early mode shift by passengers, employees and freight.

3. BCC as M&WPA requests early sight of the Resource Management Plan (Table 4.5) and in particular the waste sections to enable an Inspector at the forthcoming M&WLP Examination to be advised on the implications of Heathrow construction and operation. For construction BCC considers that HAL should, even at this early stage, be able to provide an outline of the construction and waste management methodology which will be passed through to contractors bidding for Tier 1 contracts and then passed down through contract awards to sub- contractors.

5. Air Quality and Odour

1. BCC will continue to work with our District colleagues through the Bucks Air Quality Management Group to ensure that the air quality and odour sources and receptors within the BCC remit are considered and design changes and mitigations sought from HAL which deliver improved Public Health outcomes. Where possible the Council's other roles, such as right of way, Country Parks and Schools will be used to both inform that design and facilitate mitigation delivery.

6. Biodiversity (Ecology Advisor and Consultant to SBDC)

1. The approach to the EIA appears satisfactory with respect to the predicted impacts and methods of assessment. BCC's main concern is that the scope of the DCO must be fully accounted for, especially with respect to the ecological vectors which are scoped in and out and the value placed on them.

2. BCC understand that HAL advise that detailed design and therefore full impacts cannot be applied initially (i.e. initially during the EIA assessment) but will be left until after the determination of the order or application. As a consequence, BCC is concerned that vital information may therefore be omitted and vectors scoped out incorrectly. It is important therefore to adopt a precautionary approach to biodiversity and over scoping rather than under scoping occurs.

3. For instance, the current level of surveys (south of the M4) has, it is reported, found no major ecological constraints. However once the survey area has been extended to the north (i.e. into Buckinghamshire) to cover road developments and flood prevention elements, this may impact on the Colne valley more and more constraints may be present. Therefore changes to the scope of the DCO need to be incorporated into the EIA at all times and survey and data searches need to reflect these changes.

4. Paragraph ii of the scoping document states 'environment assessment does not rely upon precise component location or detailed design information but informs the Preliminary Environmental Information Report to be published with the preferred plans' This approach potentially will mean vectors are undervalued, scoped out or impacts predicted incorrectly. They may not then be considered during changes/ the addition of new land areas which come later.

5. HAL's desk studies and surveys must also take into account the fact that ecology impacts can occur a long way from the source of impact, especially when river catchments and protected sites are being considered. Data collection and surveys covering a restricted buffer of 2km (as currently requested by HAL) may not be adequate.

6. The Colne Valley and chalk river catchments are particularly important areas for the vital movement of biodiversity. Therefore the impact to connectivity of habitat need to be carefully considered, not just in relation to the most protected species but also more common species or assemblages (such as migrating birds and mammals of open spaces and reptiles) All these groups (and others) contain species which are in decline, but once considered common (e.g. hares, hedgehogs, adders, common lizard) The danger is that these species will suffer extinctions if connectivity is cut off. Therefore it is vital that HAL in the EIA does not just value our most protected species but places them in the context of other species and habitats.

7. In a major development such as this it may be common species assemblages that are most at risk of local extinction because of fragmentation of habitat. This should be fully considered within the EIA.

8. BCC notes that HAL's surveys have identified the presence of protected species to the north and west of the airport i.e. close to the administrative boundary of the county. This

reinforces the need to consider the wider connectivity of the ecology network particularly along river/ water course corridors.

7. Carbon & Other GHG and 8. Climate Change

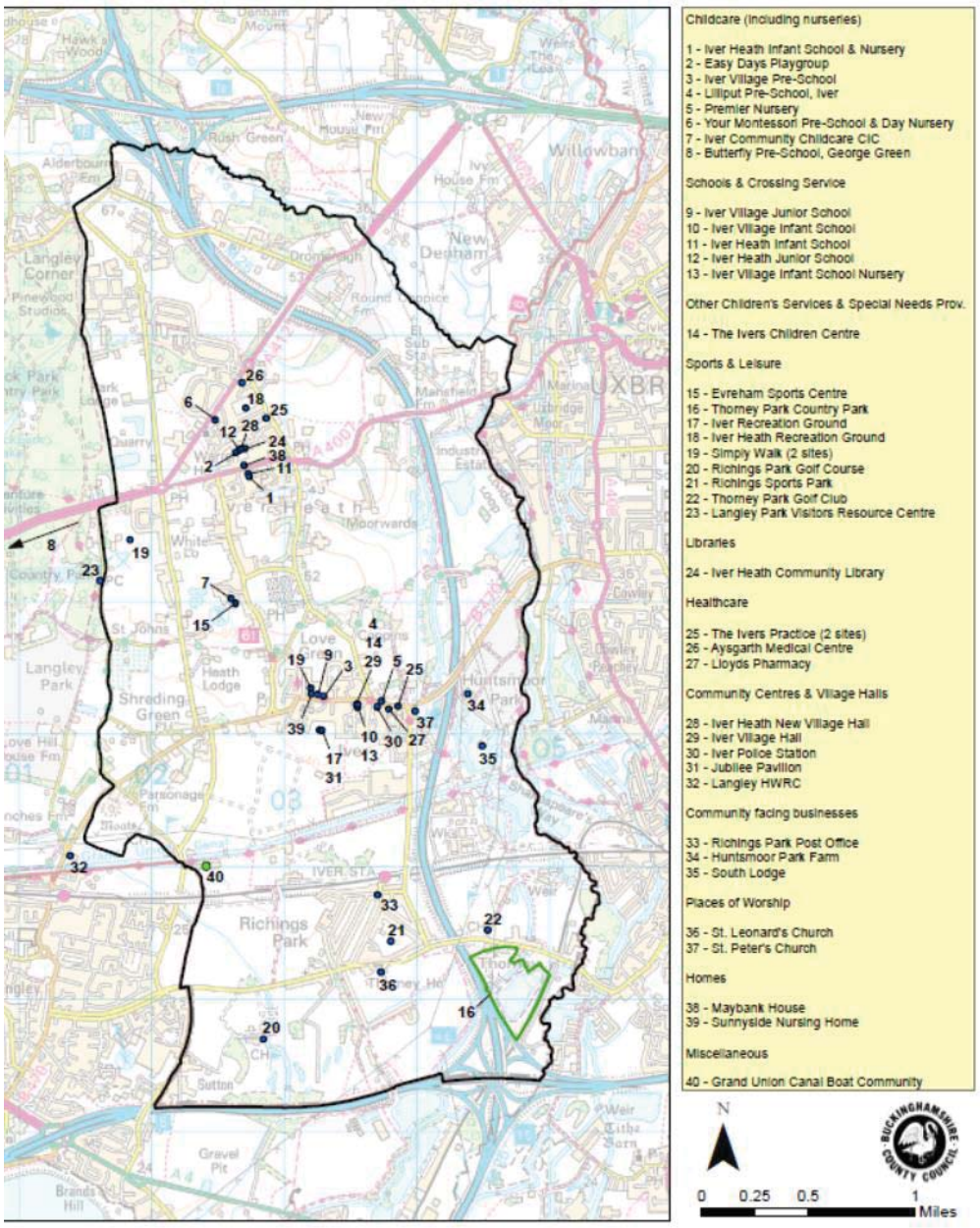
1. BCC will address Carbon. GHG and Climate Change matters through interrelated topics including Transport.

9. Community (Strategic Infrastructure Project Lead and Strategic Access Officer)

1. BCC has been working with HAL and as a founding member of the Iver Member Liaison Group: a partnership between the parish, district and county councillors, to ensure that the Ivers community is fully considered as part of the multiple major projects permitted, planned and to be constructed and operated in the area. The Community Facility Plan below has been provided to HAL to show the community assets (in response to the HAL: Socio Economic technical note (April 2018)) to assist HAL's consideration of these services and locations as part of master planning, DCO design iteration, mitigation and compensation.

2. With reference to Table 9.4 BCC has provided comments to HAL on its Socio economic technical note (provided to HSPG members on 24 April 2018) which includes Iver within the Inner Study Area. BCC acknowledges that the ES is a 'work in practice' and that HAL themselves recognise that the Study Area is highly likely to increase to cover more of southern Bucks as mitigation areas are confirmed in the county. It is unfortunate that Table 9.4 does not include or reference the Ivers community. BCC requests that HAL re confirm the Ivers community is in the Inner Study Area, as set out in the April 2018 Technical Note.

Heathrow: Community Service Locations & Facilities in Iver



3. BCC notes that footpaths are considered in the Community topic rather than Traffic and Transport. BCC has responsibility for the maintenance of public rights of way, including footpaths, bridleways, restricted byways and byways. These routes are legally recorded on the definitive map and statement, and the council has a statutory duty to review and keep it up-to-date. BCC is strategically guided by the Buckinghamshire Rights of Way Improvement Plan 2008-18 and The Buckinghamshire Local Access Forum.

4. Rights of Way form an important part of the strategic sustainable transport network by allowing public access for walking and cycling between communities and for travelling to work as an alternative to the private car. They are part of an integrated transport network, linking transport modes such as railway stations, bus and cycle routes. Much of the National Cycle Network follow rights of way. BCC in view of the local access opportunities that the Project can provide **recommends** that Rights of Way be considered in the Transport and Traffic topic. BCC suggests that rights of way also need to be addressed under the socio-economic, health and landscape and visual impact topics and be considered in the Cumulative assessment. This includes impacts with other projects including the Western Rail Link to Heathrow DCO.

5. Impacts on the severance of footpaths and bridleways needs to be addressed by HAL and convenient alternative routes provided. More ambitious walking and cycling routes, separated from roads, and part of a wider green infrastructure network, should also be addressed as mitigation for the local communities affected by the Project. Examples where cross-boundary improvements could be made include the Grand Union Canal, sections of the Colne Valley Trail and Thames Path (National Trail) corridor from Maidenhead to Windsor. Another link is a potential M4 crossing at Old Slade Lane where a bridge is being replaced under the M4 Smart Motorway DCO project. Footpath links including current permissive routes under the M25 should link with Colne Valley Trail. HAL should follow Sustrans construction standards and also ensure bridleway rights are recorded.

6. The rights of way network also provides recreational opportunities for people seeking fresh air and exercise. Local, regional and nationally promoted routes need to be identified in the EIA, as well as locally popular routes. Open access land, common land, village greens and other recreational open spaces should be assessed. Impacts should be recognised and measures proposed to mitigate any restricted access to green spaces and open countryside as a result of the scheme. If rights of way need to be formally closed during construction, suitable alternatives should be available.

7. BCC has provided Information on rights of way in the Buckinghamshire to HAL.

10. Economics and Employment

1. BCC is working with BTVLEP to consider and support the economic benefits of expansion for the county's residents and businesses and the wider England's Economic Heartlands area. BCC will consider the adverse economic impacts of the Project through the Transport topic and seek to ensure that mitigation provides for improved local and wider county access to employment, training and business opportunities. The key measures of this will be:

    - reducing journey times to the Heathrow area from High Wycombe, Aylesbury and other Bucks towns and so for all residents and businesses
    - improving the availability and frequency of travel options for residents and businesses in southern Bucks

11. Historic Environment (Senior Archaeology Officer)

1. BCC's Buckinghamshire County Archaeological Service maintains the local Historic Environment Record and provide expert advice on archaeology and related matters.

2. BCC welcome that the Historic Environment is included in all of the design components and development phases in Table 1 on page iv of the EIA Scoping Report Vol 1 Main Report May 2018. We also welcome the inclusion of the Historic Environment in Chapter 4: Approach to EIA Scoping, page 4.26, which includes the direct loss of significance and the change in significance during construction and change in significance through the material and/or perceptual change to heritage assets during the operation phase.

3. BCC especially welcomes the inclusion of Chapter 11 of the EIA Scoping Report Vol 1 Main Report May 2018 starting on page 11.2. Stakeholder engagement has taken place as stated in section 11.3 and welcome that …This dialogue will continue throughout the pre-application period as part of the EIA process…

4. BCC expect that the impact area of the proposed scheme will increase as ecological and flood mitigation schemes are developed and welcome that 11.4 includes …As the design and consultation processes progress and the DCO Project is refined, the study areas may

continue to evolve to accommodate any changes that are generated. As the study areas change, data collection may also be reviewed and updated…

5. Paragraph 11.4.3 on page 11.7 of Vol 1 Main report states, the core historic environment study area will be used to develop an understanding of the historic environment relating to the development footprint of the DCO Project. BCC consider this extensive study area allows for a holistic approach to the characterisation and assessment of the historic landscape and informs the identification of designated and non-designated historic environment assets, especially their setting, across the wider area.

6. We welcome the inclusion of the following paragraphs:

   - Paragraph 11.5.6 on page 11.10 states, Archaeological monitoring of the on-going investigation works and review of borehole logs is currently underway.

   - Paragraph 11.6.28 on page 11.14 states, Base line data on non-designated heritage assets will be incorporated as part of the detailed baseline studies and non-designated heritage assets will form part of the historic environment assessment …

   - Paragraph 11.9.8 on page 11.18 states, In accordance with Historic England advice and guidance, the historic environment baseline surveys (incorporating existing HERs) will include:

     1. Historic Landscape Characterisation
     2. Historic Area Assessment
     3. Historic Aerial Photographic Survey
     4. Archaeological Archive Review
     5. Archaeological Field Evaluation

   - Paragraph 11.9.13 on page 11.19 states, A programme of archaeological field evaluation will be undertaken in accordance with the overarching written scheme of investigation to be produced in agreement with Historic England, the HSPG and Greater London Archaeology Advisory Service (GLASS). This may include non-intrusive geophysical survey and a programme of targeted trial trench evaluation. These arrangements will be subject to further agreement with those stakeholders following consultation of the archaeological archive review.

   - Paragraph 11.9.14 on page 11.19 states, Design of any future archaeological field evaluation will be based on the extent of the design, which will define the spatial extent of intrusive groundworks…

7. BCC welcome section 11.10 Approach to Mitigation on page 11.25 and its two principle elements:

   1. Appropriate historic environment mitigation will be embedded within the design of the DCO Project. Where possible, scheme design, construction and operational practices will be used to avoid or reduce impacts on known historic environment assets. These measures will be taken as part of the assessment of effects of the DCO Project against baseline conditions.

   2. Where such built in design changes have not fully addressed likely environmental effects on the historic environment, a mitigation strategy will be developed. The approach to historic environment mitigation, where required, will be developed in consultation with Historic England and relevant stakeholders and follow appropriate guidelines and current best practice and in reference to mitigation proposed or other environmental topics.

8. Whilst BCC had concerns over the approach to the historic environment being focussed on designated assets and the built environment these issues appear to have been addressed and BCC welcome the commitment to consultation with stakeholders. We understand that an additional document is currently being produced entitled the Archaeology Strategy Plan and we look forward to reviewing this and the overarching written scheme of investigation when these are available.

12. Health (BCC Public Health Consultant)

1. Overall the Scoping Report appears comprehensive, if generic, given the unique elements of the Heathrow project. BCC will need to consider the initial HAL baseline work and findings before being able to advise on whether HAL have considered the community in southern Buckinghamshire appropriately, their public health characteristics and the likelihood that HAL will assess these and mitigate the health impacts of the development. The HIA study area should cover all of the Iver parish area and be extended when and if HAL identify land and communities outside of this area that may be impacted by sources of potential impact including construction traffic, air quality and aircraft noise.

2. Mental health is not specially mentioned even though wellbeing is mentioned. HAL need to include mental health as part of this assessment.

3. Baseline: It remains unclear what this assessment will do if there is no current baseline measurement of our communities and at locations which may be affected worsening air quality or aircraft noise for example/. Will HAL undertake a quick baseline measurement or will PINs recommend that baseline measurement is undertaken? BCC has identified four locations in the Ivers requiring baseline assessment (air quality and noise). These are at clusters of community facility locations, including schools, at Richings Park, Iver High Street, Iver Heath School and Langley Park. At least one location in Iver should also have a ANPR vehicle monitoring to identify the split between different roads users. Part of the approach to mental health should be to provide information and an explanation to the community of the current baseline and how this will change in order to reduce anxiety.

4. BCC supports SBDC in its work with other Councils and HAL as a member of the Heathrow Airwatch Partnership and the Heathrow Community Noise Forum. The wider communication of the work of these partnerships/ groups can assist communities to understand the current baseline and direction of travel of the airport.

5. Vulnerable groups: How are HAL going to ensure they have vulnerable representatives from southern Bucks (the Ivers and locations affected by aircraft noise) part of the qualitative assessment? This includes the residents on the Grand Union Canal and the Mansion Lane residential park. BCC would welcome continued involvement to ensure that the level of 'significance' is appropriate (quantitative & qualitative) for vulnerable groups/ members of southern Bucks communities.

13. Landscape & visual amenity

1. BCC is working with the Colne Valley Park on landscape matters. BCC support the approach of Historic England that HAL should assess the historic landscape value of areas proposed for development and mitigation and the reasons why those areas of land have been designated as nationally important. BCC will consider historic landscape character matters in part under the Historic Environment topic. BCC will also consider tranquillity (ANPS 5.213) in Green Belt land and the AONB in assessing the noise impacts on services as part of the Community and Socio Economic topics.

2. With reference to BCC's previous comments and HAL's acknowledgement that the study area is highly likely to widen (Scoping paragraph 13.4.1), BCC will consider the landscape

and visual impacts of the DCO elements within the county when these are confirmed by HAL and the 5km radius (13.4.2) extended to cover a wider area of southern Bucks.

3. With reference to Table 13.3, BCC ask that HAL includes BCC data including that within and supporting the Buckinghamshire Minerals and Waste Core Strategy and emerging Local Plan as well as data historic data already provided to HAL and with the search area appropriately extended to assess new land take options.

14. Land Quality (including Minerals) (Senior Planning Officer)

- VOLUME 1

1. The review of the development plans does not include the emerging Minerals and Waste Local Plan.

- VOLUME 2

2. Comments in relation to Figure 14.7: Minerals safeguarding sites:

The following sites should be included by HAL as part of the revised baseline:

- All Souls Farm quarry at Wexham Park Lane, Wexham, Buckinghamshire SL3 6LA- for the history of the site, red line area please refer to Delegated Report for application no. CM/46/17;

- Park Lodge quarry at Pinewood Road, Iver Heath Buckinghamshire, SL0 0NE- for the history of the site, red line area please refer to Committee Report for application no. CM/34/17; site in restoration phase. As discussed with HAL this site may be suitable for biodiversity offsetting and / or enhancement/ re provision of Parks and informal recreation;

- George Green quarry at Land Adjacent to Uxbridge Road, George Green, Slough SL2 5NH- for the history of the site, red line area please refer to Committee Report for application no. 13/00575/CC;

- Thorney Mill Sidings at Thorney Mill Road, Iver, Buckinghamshire UB7 7EZ- outstanding application CM/19/17. Given direct rail access and links into the construction area (south of the M4 the site has potential for materials stockpiling if serviced directly by rail without HGV movements.

b) Other Matters - Fig 14.7

- North Denham quarry and North Richings Park sites are not Mineral Safeguarded Sites but North Denham North West extension is a Mineral Preferred Area in the draft MWLP for Bucks;

- North Park Richings Park is a site with Planning Permission (CM/51/16)

Site and planning application information can be accessed at https://publicaccess.buckscc.gov.uk/online-applications/ using the reference numbers.

- VOLUME 3

Appendix 1.2

3. Para 1.2.12 The last sentence appears not to be finished, unsure what comment HAL seeking to be made in relation to 'drive time'.

Appendix 4.1

4. Cumulative effects Para 1.5.9. It would be beneficial for HAL to provide some level of certainty and provide a list of existing projects which will be taken into consideration. Also rather than relying on 'professional judgment' only it may be useful to look at other major projects and their assessment which will then allow HAL to estimate expected waste increase. BCC has provided HAL with the principles document developed by on behalf of all the HS2 Phase 1 Councils which should guide this work excepting that the position will change as the DCO progresses and Tier 1 contractors and below are appointed.

5. Significance criteria for waste, Table 1.41 and Table 1.4.2 in appendix 4.1. As Waste Planning Authorities within the South East, BCC and other WPAs have identified, and agreed, significate waste movement threshold from one authority into another. For the South East these are:

a) Non Hazardous /HIC - 2,500tpa
b) Inert/CDE - 5,000tpa
c) Hazardous - 100tpa

6. The amounts identified within table 1.4.1 are significantly above these thresholds and not acceptable to BCC. The addition of up to 2,000,000 tpa, as set out to be minor adverse impact, would if all managed in Bucks would be double the amount of inert waste received in Bucks compared to 2016 figures. While we acknowledge this would not all go to one authority, across the South East Region this is a significate increase to capacity requirements, and not a minor adverse impact.

7. Table 1.4.1 and 1.4.2 each identify a decrease in landfill void space on varying scale based on severity. There is no definition or measurement placed against local or regional scale. BCC's particular concern is with the Non-inert landfill void space. This is a particular issue that WPAs within the South East are working together on. Any net increase in non-inert landfill and a reduction in void space were it on a local or regional scale would be a major adverse impact for authorities within the South East. This is not just a South East issue, the waste management 2016 summary published by the EA Waste management 2016 summary shows it is a wider issue across England. As a consequence it is vital that schemes of this scale pushes waste up the hierarchy (a set out in our HS2 Principles) and where appropriate look at options for the scheme to manage its own waste before considering offsite disposal.

8. Are HAL proposing that non-inert waste (construction and operation) needs to go to disposal, rather than recycling or recovery? If so this will have an impact on emissions and greenhouse gases implications of the scheme.

15. Major accidents and hazards (Head of Resilience)

1. BCC understanding of the in scope area is that flights above the new footprint are included in the risk assessment. That is good. We are concerned that the disassociation of this DCO and the Airspace Change would mean this would be a gap in the DCO and overall consent process. This DCO must consider the impact of the higher levels of air traffic and the greater likelihood of an air crash and the impact on the environment of that.

2. What role does the Environment Agency and Public Health England have on this topic for the DCO?

3. The methodology for terminology / risk assessment needs to be aligned to the UK system of civil contingencies as practised currently. Civil Contingencies Act (2004), Regulations, Statutory Guidance, National Risk Register and National Risk Management process need to be applied to ensure consistency across the board and to ensure that the risk appetite etc is to a single national standard and not a Heathrow adopted standard which may be inappropriate for the DCO and/ or other regulatory approval processes.

4. Note that Heathrow (HAL) is a Category 2 Responder under the CCA and therefore has a statutory duty to share information and cooperate – i.e. they are a part of the Local resilience Forum (LRF). With a footprint in Slough – and prospective land take in Bucks – HAL must also be part of the Thames Valley LRF and so must be expected to liaise with the TVLRF as well as any other they are affecting.

5. The CCA is not mentioned in the list of legislation, nor is the statutory guidance of Emergency Planning & Preparedness – which explains the risk management process. As a Category 2 responder, HAL has a duty to be a part of the LRF and contribute information to the LRF's Risk Groups if requested. This must be part of the consultation and ES process.

6. There is a Risk assessment group in each LRF – HAL should work with that group to assess the risks and associated gaps before putting anything out of scope.

7. Major Accident / Disaster terminology is understandable as the title is MA / D, but HAL should be using the terminology and definitions based on CCA and Integrated Emergency Management – the MA definition from COMAH is about an industrial site going wrong, we are talking emergencies:

   "An event or situation which threatens serious damage to human welfare in a place in the UK, the environment of a place in the UK, or war or terrorism which threatens serious damage to the security of the UK".

   The threat to human welfare is an emergency only if it involves, causes or may cause:

   - Loss of human life,
   - Human illness or injury,
   - Homelessness,
   - Damage to property,
   - Disruption of a supply of money, food, water, energy or fuel,
   - Disruption of a system of communication,
   - Disruption of facilities for transport, or
   - Disruption of services relating to health"

8. Consultees should be advised of the risk appetite of HAL – are they only interested in very high risks or will they also consider high / medium risks.

9. The risk matrix needs to be consistent with the LRF's CRR and the UK's NRR to ensure commonality and agreed levels of risk.

10. **Appendix 15.3**:

a. What is the study area – consultees should be provided with a reference from within the 2000 odd pages.

b. HAL and consultees need to consider the receptors outside of the study area (assuming it's not very big?) but which may be impacted by the impacts of any hazard / threat / risk caused by an event.

c. Population and human health. This is a list of names. It needs to provide more detail on the component elements of the locations, with particular attention to the vulnerable, who are more likely to be affected in the event of an emergency. HAL should identify hospitals, surgeries, schools, nurseries, care homes, nursing homes, residential homes / shelters etc. This information has been provided to HAL by BCC and is referenced in the response on Community.

11. **Appendix 15.4**:

a. These hazards and threats need to be drawn from the CCA / NRR risk management procedure.

b. HAL to include local threats / hazards identified by local risk managers and the LRF that may impact – e.g. public disorder, heightened likelihood of terrorism, strikes / bad weather impacting on flights with greater numbers of people unable to fly from the airport and stacking up.

12. **Appendix 15.5:**

a. As a principle HAL shouldn't 'scope out' without talking to the LRF risk groups and agreeing the approach.

b. HAL can't scope out security risks if they are going to impact on the environment / people. HAL need to risk assess this and then ensure that control measures are put in place, look at the residual risk and see if this is tolerable. Although unlikely to be any impact that a non-malicious hazard would produce, HAL could arguably take those out via other routes by not looking at airspace change in this document. IF a plane was brought down by terrorism it could land on a built up area causing catastrophic levels of casualties – are HAL saying that HAL and the Secretary of State saying the DCO will not look at that impact because Security will always prevent a bomb being put on a plane. Are LRF and Councils not able to comment on a non-malicious accident because airspace change is outside the DCO scope?

c. Scoping out biosecurity – rationale given for scoping this out is inadequate (and 1.1.7.3 is irrelevant to the consultation).

d. Appears to be confusion between having a risk assessment for the construction process and having an environmental impact assessment. Similarly HAL is incorrect not to scope things like artefacts / rare species travelling through Heathrow as it has no impact on the environment. As an operational matter this needs to be set out based on HAL's own current risk register.

e. 1.1.14. Don't scope out and instead consider them and assess them and then state whether they are covered elsewhere.

f. With an extension of the footprint of development into the Thames Valley, HAL MUST now engages with the Thames Valley Local Resilience Forum. This needs to be part of the DCO ES requirements (as well as a statutory duty).

13. **Table 15.5.2**:

a. Sect 1.2: SARS / Ebola gets in – need to be included.

b. Also mosquitos – not only gets in but could settle in the environment with novel diseases to the UK – HAL needs to monitor mosquito populations in the environment. Suggest discussion with PHE who attend the TVLRF Risk group.

c. Radiological device legally in a plane comes down in the study area – why shouldn't this be in scope? Ditto chemical / biological.

d. Malicious attack – range from environmental protesters to terrorism – this remain in scope.

e. In summary, don't take anything out of scope unless agreed by the LRF risk group – and then assess everything and record control measures in place.

f. Wild fire – large smoke plumes across the area. Not in scope…?

g. Animal disease in vicinity of Heathrow – if a protective zone was covering Heathrow's footprint, then they would need to consider what measures are required. In scope.

h. Space weather – CME / EMP could take out multiple aircraft with catastrophic impacts. Secondary consequences loss of electricity; tertiary consequences loss of fuel pumps, security measures, water pumps etc. Still not in scope?

14. **Table 15.7.1:**

a. Human populations – severe should include loss of life in low numbers; Large should have a greater number.

b. With all these, HAL should cross-reference with the National Risk Register for consistency.

15. CONCLUSION:

a. HAL should make the ES consistent with the current practice in the UK for Civil Contingencies planning and preparedness, specifically using Integrated Emergency Management and the national risk management process. If done, then this will follow tried and tested approach and assist in assessment and the agreement of design changes and mitigation.

16. Noise and vibration

1. Noting the role of the CAA (paragraph 1.7.3) and prospectively that of ICCAN, BCC will continue to work with our District colleagues on noise issues. Having set out BCC's principles for Airspace Change Process and for the consideration of noise impacts in previous consultation responses, BCC will now take forward these through related sections in the EIA including Health. BCC statutory and service functions i.e. schools, Country Parks will seek to work with HAL to ensure that service users are informed of possible impacts and

have an opportunity to make comments to meaningfully influence HALs design and mitigation decision.

17. Traffic and transport (Transport Strategy Lead Officer)

1. It is difficult to comment properly on the Scoping Report document because the precise nature of the interplay between the Surface Access Strategy, the Transport Assessment and Travel Plan, and the EIA is not specified in enough detail to help a reader understand.

2. BCC's principal concern (shared with HSPG) is that there is insufficient 'red line' information. The commitment to 50% public transport boundary should at least be measured from a point beyond the car parking zones, rather than at the perimeter fence.

3. Discussion about the timing of transport modelling needs to take into account when construction starts. This needs to be realistic and flexible. To provide current traffic data it would reassure us if HAL started now installing automatic traffic counting technology at key locations. Sites could be chosen with HSPG to represent sensitive locations and would also serve to allow comparisons with transport models to be made. The HHASAM model looks impressive but we need precise control points on our network (such as on Iver High Street, Burnham Beeches and M40) so we can check outputs against the BCC Countywide model. BCC is in the process of agreeing these with HAL.

4. Some assumptions (such as walk and cycle speeds of 5&10kph) are mentioned, but with a mode as complex as HASSAM more details of assumptions should already have been provided to modelling experts at HSPG to consider and agree or revise.

5. Accepting that specific schemes are not mentioned by name, HS2 is such a significant project with existing approval and in construction that it deserves consideration even at this stage. A connection to the Chiltern Line at Old Oak Common has particular interest to Buckinghamshire and indeed was referenced by the Secretary of State in his statement to the House of Commons when the draft ANPS was laid before the house.

6. Some mentions of principles or clear statements of intent would have been welcome. For example, bus journey times on the last 5km of their journey to be at least 20% less than journey times car, or similar.

7. Although freight and taxi use will be included in the modelling, there is enough significance in their impact that a special study is needed to include factors such as industry practice and cultural trends. Freight, for example, where it uses small vans in large numbers, and the role and influence of the black cab industry group would not be normally reflected in standard models.

8. Freight consolidation centres do not have a reliable history in the UK, and a special study of this would be required to reassure us about potential long-term use. This should address current practice, lessons from other projects and international best practice.

9. Whilst accepting that it is early days to talk about mitigation; although HAL are doing so with reference to air quality impacts from transport, there is a section on this in the report and it could be made clearer exactly how and when there will be an approach to working with highway authorities to fund, design and build mitigation measures.

10. Para 5.13 of the ANPS talks about reducing community severance. This also applies to non-highway access including bridleways and informal 'desire line' routes. This is important for trips from and within the Colne Valley and should be recognised.

11. It is good that para 17.5.2 mentions ‘walkovers’ as these are important for the bridleway network and to identify key informal routes (the holes in the fence). BCC would be happy to contribute mapping and knowledge to this study. (see map below) Other parts of the EIR mention user surveys, which could be cross-referenced here.

12. As a key point there should be mention of improvements that start before construction begins. For example, the introduction of controls over drop-offs by non back-loaded taxis, and the introduction of realistic car parking charges for staff could precede full construction. As the draft policy references percentages, the early introduction of measures now to achieve quick wins and start to prove the case for interventions should not weigh against the DCO decision balance but rather enable community and business support for the overall mitigation and compensation package.

13. The engagement table (17.2) slightly exaggerates the outcome of meetings, for example describing one as has having ‘no comments or queries’. Some meetings have been organised at late notice and had fewer than ten people there, though even that small number have made consistent comments and queries, not least about the location of the red line. BCC is recording meetings and outcomes as part of the DCO engagement process to enable HAL and BCC to reach an agreed Statement of Common Ground. It would be unfortunate if in response to an adequacy of consultation request during DCO acceptance if, BCC or others considered the Consultation Report did not accurately reflect views expressed particularly if this then led to a public misrepresentation of views to residents and business.

14. Whilst acknowledging the political difficulties with TfL and Hillingdon, at least some mention should be made of how their objective technical requirements are being dealt with.

15. BCC is pleased that is recognition that sensitive areas such as Iver will be examined at a potentially lower threshold. HAL has agreed this requires more clarity. Numbers such as 5%, 10% and 30% are mentioned in the report in different paragraphs at different stages.

16. Table 17.3 includes a good section on Construction Traffic which is a concern for us. Specific mention of Iver High Street would be good here, as well as specific mention of off-highway cycle routes as a potential source of severance. Early geographic de scoping of transport impacts could allays community fears and enable HAL to work on more deliverable options.

17. The Iver Relief Road should be specifically mentioned in Table 17.3 as a potential highway improvement.

18. Positive Bus operation improvements could be added to the bus route changes. For example, an extension of the free bus zone. BCC is also supportive of appropriately located bus priority routes and bus only gateways which enable local employees and passengers to choose bus travel. BCC notes that a number of bus gateways already operate and enable efficient local movement of staff on the ‘last mile’ of the journey.

19. It is noted that consideration of residents has almost no mention in this entire section.

20. Table 17.4 describes how significance will be assessed. Other document sections, such as air quality, are stronger at this – using such things as expert panels. Developing a consensus with HSPG would appear to be desirable aim here.

21. The construction section 17.10 contains good aspirations. BCC would like early input, along with HSPG colleagues, to ensure HGV routes that a feasible and supported by policy are defined. Adherence to the good standards developed by TfL should be mentioned here.

22. At the earliest possible opportunity, the use of freight by rail should have a separate study with numerical targets and delivery dates.

23. There are many references to transport issues in other parts of the document. For example para 5.10.16 mentions that Heathrow is "exploring the potential for ...access charges". This is not cross-referenced in section 17 (and is not a useful form of phrase). As a significant issue in the recent Silverton DCO, HAL should set out the process for consideration of charging with other 'carrot & stick' measures.

24. Although it is a data table Iver is mentioned in Figure 9.1 but not included where it should be in Table 9.4

25. BCC note that boundaries have to be drawn for the study area and BCC would like to see the air quality study area in Fig 5.1 drawn at least 2km to the North of Iver High Street, to include Iver Heath and the A4007 rather than 1km to the South. BCC has explained the reasoning to HAL and HAL acknowledge that the inclusion of further land in southern Buckinghamshire for the project and mitigation will require a change to most, if not all study areas. With reference to Air Quality and Noise, BCC as Public Health body as well as Highway and Transport Authority and service provider recommends baseline air quality and noise monitoring is undertaken by HAL at:

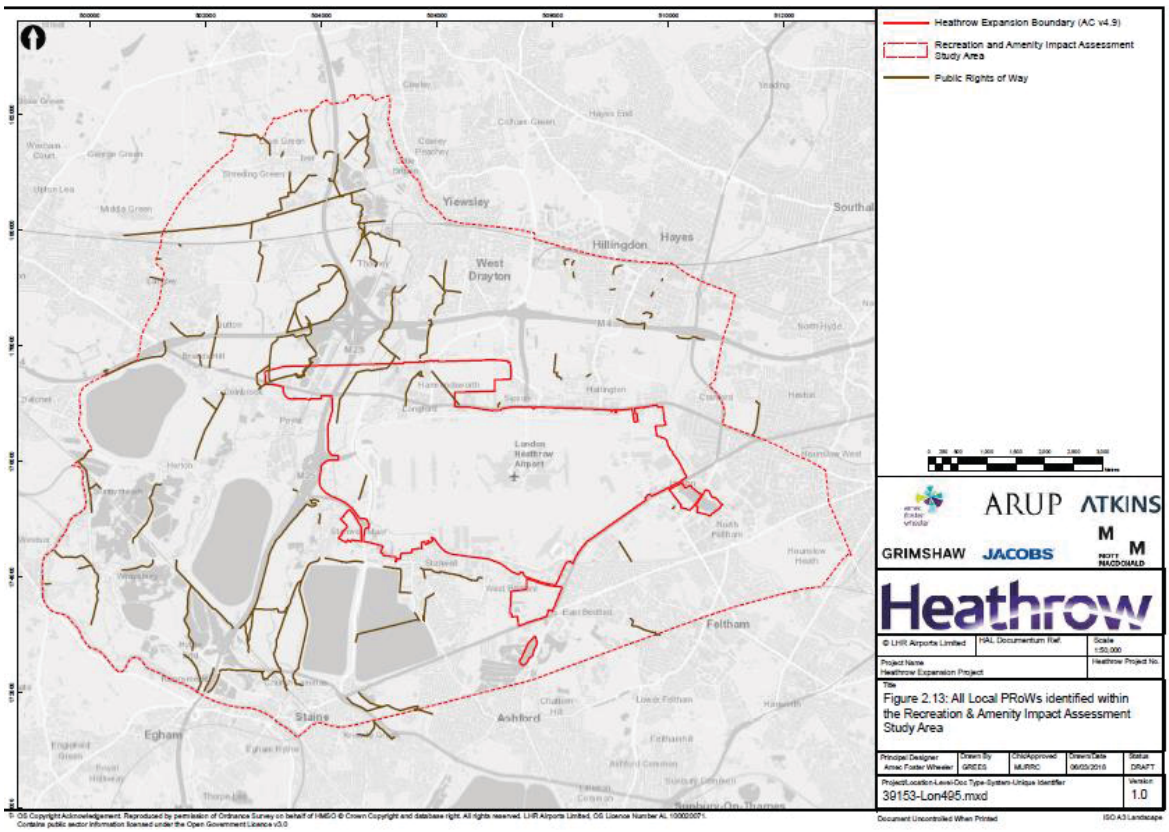
    - Iver Village Infant School, Iver High Street (B470)
    - St Leonards Church, Richings Park
    - Iver Heath Infant School, A4007
    - Langley Park Visitor Centre

    Baseline air quality monitoring on Iver High Street (see Health comments), should be supplemented by HAL through the installation of ANPR equipment to provide data on the mix of vehicles and so inform decisions on Iver Relief Road based on traffic flows and the source of vehicle emissions.

26. Some sections of the Report, such as 12.10 Health, include a lot of words and good basic principles but lack any kind of highlighting of what would be unique to this project. Examples might include specific mention of contact with GPs, a construction worker health check scheme etc.

Appendix – from the appendix (not included in the volume of figures or referenced in the main report)

27. The extract below illustrates a BCC concern that is evident gaps in the PROW network from, to and indeed within the Buckinghamshire network. Some of these are connected by other routes but some are not. Some sections are informally connected (via a hole in the fence) but there is a very high risk that consideration of PROW in one section and cycling in another section presents a risk of the issue of providing coherent routes 'falling between two stools'.



18. Water environment (Strategic Flood Management Team Leader)

1. Legislative and planning context: The BCC Flood Management team comment on issues concerned with Surface Water, ordinary watercourses and Groundwater Flooding. These being a BCC area of responsibility under the Flood and Water Management Act 2010.The EIA needs to take into account the Local Flood Risk Management Strategy of the LLFAs. For BCC this can be found here: http://www.buckscc.gov.uk/environment/flooding/strategic-flood-management/flood-management-strategy /

2. It should be noted that for ordinary watercourse any modelling work or discussions around this watercourse need to be held with the Lead Local Flood Authority (LLFA) in addition to the Environment Agency (EA).

3. Figure 3.11: The area of land impacted by the diversion and/or culverting of the watercourses seems quite restricted. Is there a definition of what these impacts are – is it just conveyance? If not then the impacts would be wider (environmentally) and if it is conveyance how can HAL be sure that the impacts are constrained to these locations?

4. Section 3.3.31: How will impacts of these different options be assessed by HAL – water flows, water quality, geomorphology and sediment transport, ecology and impact on flora/fauna, transport and movement of mammals, fish and invertebrates?

5. Table 3.6: The environmental topics relevant to operation should include health as having an open water course as opposed to a culvert can impact on the health and wellbeing of a community.

6. Section 3.3.32: The sites identified for potential flood storage do not show the capacity potential of these sites and therefore it is difficult to judge how many of these sites would be required for flood storage. The section states the overall compensation storage required for

each river, however no estimate has been given for each of the proposed flood storage locations. If the areas are over 10,000m3, they will be classed as a reservoir.

7. Will the compensation areas by in the ground, if so will an assessment on the displacement of groundwater be completed? The location of proposed compensation next to the junction of the M4 and the M25 has been identified as an area with high groundwater levels (JBA groundwater mapping). We are therefore concerned that groundwater will be displaced towards the tunnel for Western Rail Link to Heathrow. This will need to be considered as part of the WRLtH scheme and then by HAL including as part of the Cumulative Impacts Assessment.

8. Section 3.4.8: Are any of the locations for temporary construction or stockpiling in the fluvial or surface water floodplain? If so how would this be dealt with within the construction period?

9. Section 8.2.3 and 18.2.3 Due regard will be given to local policies and Governments 25 year Plan. What will HAL do to consider policy and how will this be undertaken with LLFA?

10. Table 18.2: Whilst Groundwater modelling has been discussed with the Environment Agency the responsibility for Groundwater management lies with the LLFAs so BCC and other LLFA should be involved in these discussions and be given more time (outside the Scoping timeframe) to assess the Groundwater modelling method statement in Appendix 18.2.

11. Table 18.4: Other groundwater data is available from JBA Ltd and ESI?? Local data may be available from local authorities on locations of local flood risk and flood hotspots. Local landowner and resident information can also add to this flood picture.

12. Appendix 18.2 and associated figures 18.7 and 18.8 show the fluvial flood risk but there is no reference to the surface water flood risk mapping or impacts on that existing surface water flood risk

13. Section 18.10.2 – point 3: This is the only mention of Sustainable Drainage in the document. SuDS should prioritised when managing existing and proposed surface water runoff and given greater prominence in the document in line with national guidance.

14. Appendix 18.4 Flood Risk assessment – method statement: This was not circulated to the Lead Local Flood Authorities for review.

15. Section 2.2.1: Although the impact on the surface water runoff from the new runway is to be assessed there is no recognition of the existing surface water flood risk which will be impacted in a similar way to the fluvial flood risk across the area of the new runway. Compensation areas are being provided for fluvial flood risk but what about the surface water – where does that flood water go which is being displaced by the new runway and area of expansion. Interaction and impacts on ordinary watercourses has not yet been defined – when will this be undertaken by HAL and shared with LLFA?

16. Section 2.3.2: Length of watercourse being shorter is indicated as a good thing, but this is not necessarily so. General principle around replicating natural processes, Sustainable drainage (SUDS) and Natural Flood Management all favour slowing down the flow in part to prevent adverse impacts of increased flows downstream. This should be done closer to the source or by replicating natural processes rather than using structures to play that role.

17. Table 18.4.2 – Buckinghamshire County Council have a Sustainable Drainage Developer Pack on our website

18. BCC requests that HAL provide data (shapefiles) for:

- Local surface water study area boundary
- Wider surface water study area boundary
- Groundwater study area boundary
- Locations of the proposed flood storage areas
- Locations of any monitoring locations (Groundwater and Surface Water) in Buckinghamshire

19. As the LLFA for the principle area where HAL are considering flood storage areas, BCC requests that HAL clarify the approach and timeline for information, assessment and mitigation design. This may require HAL and BCC to enter into a PPA to ensure resources are available to respond to and assist HAL during the DCO process.

-End-

Buckinghamshire FIRE & RESCUE SERVICE
we save lives

Our ref:	C0000
Enquiries to:	Jonathan James
Ext no:	1128
Direct line:	01296 744 498
Date:	11 June 2018
Email:	jjames@bucksfire.gov.uk

The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN

Dear Sir/Madam,

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11
Ref: TR020003

Further to your recent submission of documents relating to the above development, this authority's comment at this stage is as follows:

- **All applications must give due consideration to Approved Document B, Section15 (Fire Mains & Hydrants) and section 16 (Vehicle Access)**

- **Buckinghamshire & Milton Keynes Fire Authority support the installation of automatic fire suppression sprinkler installations, in new developments or in significant alterations of existing buildings. Sprinkler systems can facilitate improved safety for the occupants of buildings, greater protection of buildings and contents; they can also improve the resilience profile of the "as build environment". Sprinkler systems should be designed, installed and maintained in accordance with BS EN 12845**

Further comment will be made via Building Control as and when detailed plans are submitted.

Yours faithfully,

Jonathan James

Jonathan James
Inspecting Officer

On behalf of the Buckinghamshire & Milton Keynes Fire Authority

Cadent Gas Limited
Ashbrook Court, Prologis Park
Central Boulevard
Coventry CV7 8PE
cadentgas.com

By email to:
heathrowairport@pins.gsi.gov.uk

Cadent
Your Gas Network

TR020003 - Expansion of Heathrow Airport (Third Runway) - EIA Scoping Notification and Consultation

This is a response on behalf of Cadent Gas Limited (Cadent).

I refer to your email dated 22nd May 2018 regarding the Proposed Expansion of Heathrow Airport (Third Runway) DCO. Cadent has reviewed the scoping information and wishes to make the following comments:

In respect of existing Cadent infrastructure, Cadent will require appropriate protection for retained apparatus including compliance with relevant standards for works proposed within close proximity of its apparatus,

Cadent Infrastructure within or in close proximity to the Proposed Order Limits

Cadent has identified the following apparatus within the vicinity of the proposed works:

- Above ground installations and sites
- High or Intermediate pressure (above 2 bar) Gas Pipelines and associated equipment
- Low or Medium pressure (below 2 bar) gas pipes and associated equipment. (As a result it is highly likely that there are also gas services and associated apparatus in the vicinity)

Where the Promoter intends to acquire land, extinguish rights, or interfere with any of Cadent's apparatus, Cadent will require appropriate protection and further discussion on the impact to its apparatus and rights including adequate Protective Provisions.

Key Considerations:

- Cadent has a Deed of Grant of Easement for each pipeline, which prevents the erection of permanent / temporary buildings, or structures, change to existing ground levels, storage of materials etc.

Pipeline Crossings:

- Where existing roads cannot be used, construction traffic should ONLY cross the pipeline at previously agreed locations.
- The pipeline shall be protected, at the crossing points, by temporary rafts constructed at ground level. The third party shall review ground conditions, vehicle types and crossing frequencies to determine the type and construction of the raft required.
- The type of raft shall be agreed with Cadent prior to installation.
- No protective measures including the installation of concrete slab protection shall be installed over or near to the Cadent pipeline without the prior permission of Cadent.
- Cadent will need to agree the material, the dimensions and method of installation of the proposed protective measure.

- The method of installation shall be confirmed through the submission of a formal written method statement from the contractor to Cadent.
- Please be aware that written permission is required before any works commence within the Cadent easement strip.
- A Cadent representative shall monitor any works within close proximity to the pipeline.
- A Deed of Consent is required for any crossing of the easement

New Service Crossing:

- New services may cross the pipeline at perpendicular angle to the pipeline i.e. 90 degrees.
- A new service should not be laid parallel within an easement
- A Cadent representative shall supervise any new service crossing of a pipeline. Any exposed pipeline should be suitably supported and removed prior to backfilling
- An exposed pipeline should be suitable supported and removed prior to backfilling
- An exposed pipeline should be protected by matting and suitable timber cladding
- For pipe construction involving deep excavation (<1.5m) in the vicinity of grey iron mains, the model consultative procedure will apply therefore an integrity assessment must be conducted to confirm if diversion is required
- A Deed of Consent is required for any new service crossing the easement.
- Where a new service is to cross over the pipeline a clearance distance of 0.6 metres between the crown of the pipeline and underside of the service should be maintained. If this cannot be achieved the service shall cross below the pipeline with a clearance distance of 0.6 metres.

General Notes on Pipeline Safety:

- You should be aware of the Health and Safety Executives guidance document HS(G) 47 "Avoiding Danger from Underground Services", and Cadent's specification for Safe Working in the Vicinity of Cadent High Pressure gas pipelines and associated installations - requirements for third parties T/SP/SSW22. Digsafe leaflet Excavating Safely - Avoiding injury when working near gas pipes
- Cadent will also need to ensure that our pipelines access is maintained during and after construction.
- The actual depth and position must be confirmed on site by trial hole investigation under the supervision of a Cadent representative. Ground cover above our pipelines should not be reduced or increased.
- If any excavations are planned within 3 metres of Cadent High Pressure Pipeline or, within 10 metres of an AGI (Above Ground Installation), or if any embankment or dredging works are proposed then the actual position and depth of the pipeline must be established on site in the presence of a Cadent representative. A safe working method agreed prior to any work taking place in order to minimise the risk of damage and ensure the final depth of cover does not affect the integrity of the pipeline.
- Excavation works may take place unsupervised no closer than 3 metres from the pipeline once the actual depth and position has been has been confirmed on site under the supervision of a Cadent representative. Similarly, excavation with hand held power tools is

not permitted within 1.5 metres from our apparatus and the work is undertaken with NG supervision and guidance.

- The above guidance is not exhaustive and your works proposals must always be submitted to Cadent's Plant Protection department in advance of commencement of works on site.

Yours Faithfully

[redacted]

Vicky Stirling

Land & Property Services

Continuation sheet.

Guidance

To download a copy of the HSE Guidance HS(G)47, please use the following link:

http://www.hse.gov.uk/pubns/books/hsg47.htm

Dial Before You Dig Pipelines Guidance:

https://cadentgas.com/Digging-safely/Dial-before-you-dig

Essential Guidance document:

https://cadentgas.com/getattachment/Digging-safely/Work-safely-library/Promo-Essential-guidance/Essential_Guidance.pdf

Excavating Safely in the vicinity of gas pipes guidance (Credit card):

https://cadentgas.com/getattachment/Digging-safely/Work-safely-library/Promo-Excavating-safely-credit-card-gas/Excavating_Safely_Leaflet_Gas-1.pdf

Copies of all the Guidance Documents can also be downloaded from the National Grid Website:

https://cadentgas.com/Digging-safely/Work-safely-library

Tuesday 19th June 2018

Your ref: TR020003

3D Eagle Wing
Temple Quay
House
2 The Square
Bristol, BS1 6PN

HeathrowAirport@pins.gsi.gov.uk

Dear Sirs,

NSIP: Application by Heathrow Airport Limited (the Applicant) for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the Proposed Development)- Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

Thank you for your consultation.

The Canal & River Trust (the Trust) is the guardian of 2000 miles of historic waterways across England and Wales. We are among the largest charities in the UK. Our vision is that "living waterways transform places and enrich lives". The Trust is a prescribed consultee in the Nationally Significant Infrastructure Project (NSIP) process.

The Trust has reviewed the proposals, and on the basis that they appear unlikely to have any impact on its waterways, the nearest waterway being 200m away from the proposed development, the Trust has **no comment** to make at this time. However, if following the consultation period the proposals become significantly altered so as to come within 100m of the nearest waterway, the Trust would require to be re-consulted in order that it has the opportunity of re-considering its position.

Yours sincerely

Tessa Craig
Area Planner

Tessa.Craig@canalrivertrust.org.uk
+44 7917 616832

Development Management

Central Bedfordshire Council
Priory House, Monks Walk
Chicksands, Shefford
Bedfordshire SG17 5TQ
www.centralbedfordshire.gov.uk

The Planning Inspectorate
Temple Quay
Bristol
BS1 6PN

Contact Peter Vosper
Direct Dial 0300 300 4157
Email peter.vosper@centralbedfordshire.gov.uk
Your Ref
Date 01 June 2018

Dear Sir/Madam,

Application No: **CB/18/01896/OAC**
Location: **Heathrow Airport Limited, The Compass Centre, Nelson Road, Hounslow, Middlesex, TW6 2GW**
Proposal: **Other Authority Consultation - EIA Scoping Notification and Consultation by Heathrow Airport Limited for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the Proposed Development).**

I refer to your letter of 22 May 2018 regarding the Scoping Notification as shown above and would confirm that Central Bedfordshire Council do not have any comments at this stage.

Yours faithfully,

Andrew Davie

Andrew Davie
Assistant Director - Development Infrastructure

Civil Aviation Authority's response to Heathrow Airport Limited's Environmental Impact Assessment Scoping Report

19 June 2018

Introduction

1. The CAA is the UK's specialist aviation regulator. We work so that:

   - the aviation industry meets the highest safety standards. We regulate the safety of airport design against UK, European and international safety criteria.
   - consumers have choice, value for money, are protected and treated fairly when they fly. We regulate the costs of operating Heathrow airport and, if the Airports National Policy Statement (ANPS) is designated, will regulate the costs of expanding the airport.
   - airspace is well managed. We make decisions on proposals to change airspace design, which we do against the background of Directions and environmental guidance from the Secretary of State.
   - the aviation industry manages security risks effectively.

   We also provide the government, and third parties on a commercial basis, with environmental advice as requested, including information about the noise effects of aviation operations.

   In general, it is for government to determine environmental policy and for the CAA, where required, to implement such policy as it relates to our functions.

2. We welcome the opportunity to respond to Heathrow Airport Limited's (HAL) Environmental Impact Assessment (EIA) scoping report in our capacity as a prescribed statutory consultee in the planning process.

3. By way of general introductory comment, in paragraphs 5 to 15 we provide a high-level overview of our regulatory roles and how they relate to the Development Consent Order (DCO) process. In paragraphs 16 -20 we explain how we approached our consideration of HAL's EIA scoping report. In paragraphs 21 – 59 we provide such comments as we have at this stage on those chapters of HAL's EIA scoping report that relate to the CAA's regulatory roles.

4. For further information about the CAA's responsibilities or on any of our comments in this paper, please contact us at DCO.Coordination@caa.co.uk.

The DCO and CAA's Regulatory Processes

5. In addition to obtaining a DCO, HAL will also be required to obtain a number of regulatory approvals from the CAA in order for a new third runway to become operational. The CAA's regulatory approval processes will continue throughout the planning and construction phases. The environmental statement that will form part of HAL's DCO application will contain topics which are relevant to the CAA's regulatory processes. The three most significant regulatory areas are as follows.

Economic Regulation

6. The CAA is the economic regulator of HAL. In this capacity, we regulate the maximum revenue per passenger that HAL can make from airport charges. In setting that maximum the CAA's primary duty, as set out in s. 1(1) of the Civil Aviation Act 2012 (the Act), is to carry out its functions "*in a manner which it considers will further the interests of users of air transport services regarding the range, availability, continuity, cost and quality of airport operation services*". The other matters to which we must have regard are set out in s.1(3) of the Act.

7. S.1(3)(d) requires us to have regard to the need to secure that HAL can take reasonable measures to reduce, control or mitigate the adverse environmental effects of the airport and associated facilities. We will make appropriate allowances for the efficient costs of environmental mitigations and seek to put in place incentives to minimise these costs, including so that capacity expansion does not become unaffordable for airport users.

8. Accordingly, the efficiency of the costs (which we interpret broadly to include that there is a clear statutory driver on HAL to incur the costs, that HAL has identified the most efficient option and that its costs of delivering such options are efficient) of HAL's environmental mitigations falls to be considered in the context of the CAA's primary duty to airport users as specified in s.1(1) of the Act.

Safety Regulation

9. The CAA has a number of safety oversight responsibilities in the UK. The CAA oversees the safety of aircraft and air navigation, the control of air traffic, air traffic services personnel, the licensing of aerodromes and air crew. In recent years, the European Commission, the European Aviation Safety Agency (EASA) and International Civil Aviation Organisation have played an increasingly significant role.

10. The CAA is the national supervisory authority for the certification of air navigation services (ANS) providers covering the requirements of Regulation (EU) No. 1035/2011. Those requirements include technical and operational competence and capability, specific requirements for the provision of air traffic services, meteorological services, aeronautical information services and communication, navigation or surveillance services.

11. The CAA is also the designated competent authority for the licencing of aerodromes under Regulation (EU) No. 139/2014. The licensing process ensures continuous oversight of safety standards at civil aerodromes. Since this regulation came into force in 2014, Heathrow Airport's aerodrome licence has been converted to an EASA compliant licence.

12. Safety assurance of proposed changes can only be provided if the proposer submits to the approving authority a fully detailed concept of operations for how it intends to achieve an acceptable level of safety.

13. It might not be possible to issue some approvals without trialling the operation first. In such circumstances, permission to operate a trial may sometimes be given so that the operator can demonstrate that the concept works as intended (potentially with further mitigating action required to ensure the concept meets all requirements).

Airspace Change

14. The CAA is responsible for making decisions on proposals to change airspace design. As part of that decision-making role, we take into account a range of factors including safety, efficiency and guidance on environmental objectives from the Secretary of State. The evidence we use to consider those factors, and how it should be prepared, is set out in our regulatory process 'Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements' (CAP1616).

15. As set out in the Government's final ANPS, we expect any airspace changes associated with the new runway proposals to follow the CAA's airspace change process as set out in our guidance in CAP1616. Our guidance specifies the evidence we need from the organisation sponsoring an airspace change, including the relevant environmental data and the methodologies for producing it. The process and evidence are iterative and HAL is not yet at the stage of designing flightpaths to support their proposals. This means that some assumptions will need to be made in due course for the purposes of EIA.

CAA's response to HAL's EIA Scoping Report

16. The CAA's regulatory processes will to a significant extent run in parallel with the DCO process, but not conclude until after the DCO application has been submitted. Accordingly, the CAA may be asked by the Planning Inspectorate ("PINS") and the Secretary of State to provide an interim opinion regarding the viability of HAL's scheme.

17. It would therefore be prudent for the EIA scope and methodology to be consistent with the requirements of the CAA's regulatory processes in order to avoid duplication and aid clarity for stakeholders. Where this is not possible, we suggest that HAL explains its choice of methodology with great care and sets out the difference between the methodology used for EIA purposes and that to be used for the purposes of any submissions seeking CAA approval.

18. We have considered HAL's EIA scoping report on that basis, and we are using this response to inform PINS of the information we consider should be provided in HAL's environmental statement. We have in particular considered HAL's proposed scope and methodology to assess and mitigate the environmental effects of expansion. We have only commented on relevant chapters/EIA topics.

19. Our response below contains comments on those chapters of HAL's EIA Scoping Report that relate to our regulatory roles. In respect of airspace change CAP 1616 and CAP 1616a[1] provide the relevant metholodogies for use in environmental assessments to assist those preparing airspace change proposals. To facilitate consistency between HAL's EIA and our approach to assessing the environmental impacts of airspace change proposals, we comment in detail on the relevant chapters of the EIA.

20. In contrast, our economic regulation powers relate to the development of the airport infrastructure. Capacity expansion is a bespoke project which will have a range of environmental impacts and the scope of these will only become clear as HAL's plans are crystallised through the planning process. In these circumstances, it is not practicable or appropriate for us to set out standard methods for the assessment of plans that remain under development and, rather than comment on the detail of HAL's EIA scope and metholdoogy, we have set out our general approach above.

Chapter 5 - Air Quality and odour

21. The CAA's airspace change process, set out in CAP1616, includes methods for assessing air quality and odour issues as part of the Options appraisal a sponsor must undertake. That appraisal is required at stage 2A 'Define Options'.

22. At the core of the options appraisal is an assessment of the cost and benefits of the proposal. As part of the assessment, the change sponsor is required to monetise as many costs and benefits as possible to allow direct comparison between options. To achieve this the DfT's WebTAG[2] assessment tool is to be used.

23. CAP 1616 states that changes to local air quality impacts (which would likely include changes in both ground and air traffic movements) are to be included in the options appraisal process. These changes to local air quality must be explained in consultation material.

24. Changes to local air quality impacts must be identified when any such change affects emissions below 1000ft. Air Quality levels referred to for an aviation project such as that envisaged by HAL are SO_2, NO_2, and NO_x. The threshold for these levels is contained within section A of annex 11 to the Local Air Quality Directive: 2008/50/EC. That

[1] CAP 1616a is CAA publication 'Airspace Design: Environmental requirements technical annex'

[2] https://www.gov.uk/guidance/transport-analysis-guidance-webtag

Directive requires review of the situation every five years, or whenever significant changes in the activities may affect levels of these pollutants. The proposal contained within HAL's DCO application will result in significant changes in activities.

25. Assessment of increase in Particle Matter (PM) from aircraft should not solely focus on fuel emissions as there is also the potential for PM from other aircraft aspects, such as the wear of brake linings and tyres. Other environmental impacts will need to include those that occur as incidental impacts on and from other airspace users. For example, there may be impacts that arise from changes to General Aviation activity or changes in activity at other airports.

Chapter 6 - Biodiversity

26. In relation to biodiversity, CAP1616 requirements are unspecific. In essence, the CAA does not have any specified or preferred methodology for assessing biodiversity impacts, but the CAA will be seeking to verify that any biodiversity impacts that arise from the new airspace design have been considered.

27. Based upon the proposed scope, it is likely that the biodiversity assessment undertaken by Heathrow will also satisfy our CAP1616 requirements, provided that the assessment also makes explicit consideration of any impacts specific to the operation of the airspace design. In this regard, the scoping document does indicate that "*Production of aural and visual stimuli and vibration produced by departing/arriving aircraft*" will be an element of the biodiversity assessment (Table 6.10, page 6.41). The document also includes reference to the legislation and policy that is also cited in the DfT's Air Navigation Guidance 2017.

28. CAP1616 makes clear that biodiversity relates to areas of landscape with specific statutory purposes (AONBs and National Parks and seeks to secure their continued protection). WebTAG contains a biodiversity impacts worksheet and a landscape worksheet, completion of which focuses on descriptions of the feature in terms of tranquillity and landcover, and its classification in terms of their rarity, importance, substitutability and impact.

29. We note the list of bodies HAL is engaging in relation to biodiversity. HAL should consider whether it also needs to engage with the CAA as a potential competent authority in relation to, for example, nesting birds, under the Conservation of Habitats and Species Regulations 2017.

Chapter 7 - Carbon and other greenhouse gases

30. Paragraph 7.10.4, should include a list of mitigations to be used in the assessment, as has been done for other topics.

31. The CAA's airspace change process requires the assessment of CO_2 emission (in the context of climate change impacts); it does not require the assessment of any other greenhouse gases. The scoping document appears to limit the scope of the assessment of CO_2 emissions: for example, Table 7.4 (page 7.12). In setting out baseline conditions, the document only refers to emissions from aircraft in the landing and take-off (LTO) cycle being within scope. For the purposes of CAP1616, the CAA would require the scope of the CO_2 emissions assessment to reflect the "point to point" change in airspace design, i.e. the point at which the procedure design changes to the point at which it "re-joins" the existing procedure. This may extend beyond the LTO cycle (e.g. the cruise phase). Table 7.5 (page 7.13) does refer to flight phases beyond the LTO cycle (i.e. cruise). HAL should clarify the scope of this part of the assessment.

32. The temporal scope proposed by HAL (to 2050) appears adequate for CAP1616 purposes. CAP 1616 would necessitate a period that is at least 10 years from the implementation of the new airspace design. Scenarios will also reflect 2R and 3R which

is also consistent with the likely CAP1616 requirements. This temporal scope in relation to airspace change should be consistent across other environmental topics.

33. There are aspects of the methodology for CAP1616 that are not set out in HAL's scoping document. These are:

- The ratio for conversion of aviation fuel burn to CO_2 should be 3.18.
- The use of the DfT's WebTAG to produce a monetised value of the CO_2 emission impact for aircraft operations.
- A statement that the impact will also include an annual total tonnage for the CO_2 emission impact from aircraft operations.

34. Additionally, paragraph 7.9.22 notes that only emissions from departing flights will be assessed. This is inconsistent with the CAP1616 requirements which require a sponsor to assess the impact on arriving flights if the new airspace design affects the arriving traffic. It would seem likely that any airspace design that is proposed in order to utilise a new third runway would affect arriving flights.

Chapter 8 - Climate Change

35. The assessment, especially for flood risk should consider use of a longer time frame than 50 years. One hundred years is typical.

36. This Chapter is limited to the impacts upon Heathrow from climate change effects. On that basis the scoping methodology has no reference to CAP1616 requirements other than to ensure that any relevant assumptions used for environmental impact modelling (e.g. noise, CO_2 emissions, local air quality) properly reflect any estimated impacts from climate change over the assessment period. These should be revealed by the document's proposed 'In-combination Climate Change Impacts' assessment.

Chapter 9 - Community

37. Paragraph 9.3.5 – 5.a notes that schools will be considered as part of the assessment. We suggest that schools could be broadened out to include other education institutions and organisations, such as universities.

38. Paragraphs 9.4.7 and 9.6.1 both state that a data source for community insight will be National Statistics (Census data). The current data drawn upon is from 2011 – the report could note that the most up to date Census data will be used to inform monitoring, where possible.

Chapter 12 - Health

39. If HAL uses WebTAG as an element of their methodology for assessing noise and local air quality, then health impacts will be captured to the extent that they are required by CAP1616.

40. Whilst the scoping document does recognise that the health impacts from aviation's noise and local emissions need to be included in the Health Impact Assessment (HIA), it does not explicitly state that WebTAG will be used as part of that assessment other than a single reference at paragraph 12.9.30.

41. The methodology should include the use of WebTAG for both noise impacts and local air quality impacts.

Chapter 15 - Major Accidents and Disasters

42. Air travel, as with all other forms of transport, presents safety risks to consumers on board aircraft and the public (third parties).

Safety on board the aircraft (in flight or at the aerodrome)

43. From a safety perspective, it is noted that there is currently little or no material pertaining to how aircraft are moved to, from and around the airport. This material will be required to consider the significance of the risks consequent on those matters.

44. Regarding Appendix 15.2, we note that not all CAA Civil Aviation Publications (CAP) references are relevant following the UK's transition to EASA oversight rules e.g. CAP168. HAL should include correct references to current EASA and ICAO Standards and Recommended Practices (SARPS).

45. In terms of accident risks, the proposals will impose changes on operations or functions that are not all in Heathrow's control but are relevant to safety. The following should therefore be considered:

- Para 15.4.3 and Para 15.8.2 (point 8): It is unclear if NATS' London Terminal Control (LTC) functions pertaining to moving aircraft to and from Heathrow are included in scope. They should be included and are not considered 'external' to Heathrow's operation.
- Para 15.7.9: The need for airspace re-design should be acknowledged. Specifically, on completion of the initial climb, aircraft are likely to follow newly designed routes (possibly over populations currently not over-flown) in order to ensure safe integrated route separation for all airspace users. In addition, the need for re-designed missed approach procedures (and routings) may be of significance.
- Table 15.5: As above in 15.7.9 this should also consider manoeuvring and missed approaches, as new procedures will be required.
- Table 15.7 footnotes 13 and 14: Aircraft track interactions with other airports may change as a result of the new runway development, and therefore potential risks should be assessed.

46. Regarding Table 15.6, the 'Transport Accident' entries do not appear to include mid-air accident risk. Such a risk could arise from new routings to and from the revised runway configuration, alternation patterns and (in the construction phase) interference with communications, navigational aids or surveillance equipment necessary for the safe conduct of flight.

47. Regarding paragraph 15.9.17, the assessment year does not include the 'Early ATMs' scenario where the risks are different: for example, there will be more flights and potentially different procedures involved. HAL should therefore include an assessment of the Early ATMs case, as they have proposed under other EIA topics.

Public Safety

48. Public or third party risks are often described as individual or societal risk. In the context of the DCO process, the responsibility for judging the tolerability of public safety lies with the relevant decision maker who is able to weigh the benefits of a proposal against the safety risks. This would include the Secretary of State designating the ANPS and PINS and the Secretary of State in considering the DCO application.

49. The CAA has no specific policy or regulatory role regarding the tolerability of third party safety risks. The CAA can provide support to aid the assessment or decision maker e.g. accident statistics or mandatory occurrence reporting.

50. The CAA would make the following comments:

- The study area for major accidents involving aircraft appears to be ambiguous. In Table 15.5 the phases of flight are included, however, Paragraph 15.4.1 and Figure 15.1 show the study area as areas approx. 1km from the airport boundary for land receptors, including human populations beyond the airport. We would expect the study area to be greater than 1km from the airport boundary, taking into account risks associated with the phases of flight.

- Paragraph 15.7.10 suggests that the study area is conservative, as it is larger than the Public Safety Zone (PSZ). This is potentially misleading. The PSZ is an area where individual risk mitigation is applied in the form of development control, as set out in DfT's PSZ policy[3], aimed at reducing people congregating in the higher risk areas at the end of the runways. Risks still exist outside these areas including societal risks, and the expansion of Heathrow will change these risks either by increasing the number of flights or by affecting different populations.

- Table 15.6 includes the 'likely significant effects requiring assessment'. The M25 motorway system will have to be diverted and placed in a tunnel to accommodate the new runway overhead. The assessment should therefore include the risks associated with an aircraft and/or its fuel load, involved in a runway excursion close to the location of the tunnel, as this could result in a major accident scenario involving vehicles on the motorway.

- Table 15.6 also includes 'birdstrike' risks. It will also be important to ensure that any landscaping or water features proposed as mitigation of the development do not increase the risk of bird strike to aircraft using the aerodrome.

Chapter 16 - Noise and vibration

51. CAA is responsible for the environmental assessment of airspace change proposals, to be aligned with government policy aims to:

    a. limit and, where possible, reduce the number of people in the UK significantly affected by the adverse impacts from aircraft noise;

    b. ensure that the aviation sector makes a significant and cost-effective contribution towards reducing global emissions; and

    c. minimise local air quality emissions and in particular ensure that the UK complies with its international obligations on air quality

52. The CAA has a statutory duty[4] to publish environmental information on the environmental effects of civil aviation in the UK.

53. We welcome the risk-based approach to the assessment of noise and support the proposed LOAEL and SOAEL noise levels for air noise.

54. With a risk-based approach to identifying significant adverse impacts there is greater need to control and, where necessary, limit these impacts. We believe the proposed noise envelope needs to be aligned with the adverse impacts that will be set out in the environmental statement.

55. We note the emphasis on identifying those at risk of significant adverse effects due to noise exposure in the context of the EIA Regulations, but feel that the proposed methodology needs to more clearly set out how it will demonstrate that the DCO project

[3] https://www.gov.uk/government/publications/control-of-development-in-airport-public-safety-zones

[4] S. 84 Civil Aviation Act 2012

will ‘mitigate and minimise adverse impacts on health and quality of life’, i.e. between LOAEL and SOAEL, where not identified as significant adverse effects.

56. The proposed mitigations make no mention of a night noise insulation scheme. Whilst a 6.5-hour night ban is proposed, depending on how the runways are operated some locations could see increases within the overall 8-hour night noise exposure period.

57. Whilst these may be addressed by the proposed daytime noise insulation schemes, there is a need for additional insulation criteria based on night noise exposure in order to ensure that night noise impacts are appropriately mitigated.

58. Spatially, the extent for noise consideration extends at least to an altitude of 7000ft. In this regard, HAL will need to make sure that they use CAP1498 as the metric for assessing "overflight" by aircraft up to 7,000ft.

59. Airspace change submissions must follow the CAAs revised process which is set out in CAP1616 (references to earlier draft guidance in paras 16.11.8 and 16.11.10 to CAP1520 should be removed).

From:	Katy Jones
To:	Expansion of Heathrow Airport (Third Runway)
Cc:	[redacted]
Subject:	TR020003 - Expansion of Heathrow Airport (Third Runway) - EIA Scoping Notification and Consultation
Date:	18 June 2018 14:28:35
Attachments:	image001.jpg image002.jpg

Dear Sir,

At the Council meeting on Monday 11th June 2018, Datchet Parish Council **RESOLVED** to inform the planning inspectorate that the following information should be considered in the Environmental Statement (ES)

- Air pollution
- Noise pollution
- Increase of road traffic
- Increase of rail traffic
- Increased housing and impact on local housing re where are all the new employees going to live
- Implications for the M/4 Smarter motorway scheme.

The council would also like a full Environmental Impact Assessment (EIA) carried out to ensure that the we are given early and effective opportunities to participate in the decision making procedures.

Kind Regards,

Katy

Katy Jones
Clerk to Datchet Parish Council

Tel: 01753 773499
email: katy.jones@datchetparishcouncil.gov.uk

This e-mail and any files transmitted with it are strictly confidential and intended solely for the individuals(s) or destination to which it is addressed.
Any unauthorised use, retention, distribution, copying or disclosure is strictly prohibited.
Please view our *PRIVACY POLICY HERE* which sets out how Datchet Parish Council uses any information that you give us, including the use of cookies.

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This email has been scanned by the Symantec Email Security.cloud service.
For more information please visit http://www.symanteccloud.com

From:	Steve Barton
To:	Expansion of Heathrow Airport (Third Runway)
Subject:	RE: TR020003 - Proposed Expansion of Heathrow Airport (Third Runway)
Date:	19 June 2018 13:59:49
Attachments:	image001.gif

Dear colleague,

Thank you for consulting Ealing Council. We have input into a collective response that will be submitted by the Heathrow Strategic Planning Group (HSPG). We believe this is comprehensive and is representative of our concerns.

If you have any further queries, please do let me know.

Kind Regards,

Steve Barton

Steve Barton
Strategic Planning Manager,
Regeneration and Planning Services,
Regeneration and Housing Directorate,
Ealing Council

Tel : 0203-882-3552 (Direct Dial Skpe for Business)
Email: bartons@ealing.gov.uk

(NB Please be aware that email correspondence is preferred as I'm not always sat at my desk and will usually ensure a faster rersponse!)

From: Expansion of Heathrow Airport (Third Runway) [mailto:HeathrowAirport@pins.gsi.gov.uk]
Sent: 18 May 2018 09:37
To: Steve Barton <BartonS@ealing.gov.uk>
Subject: RE: TR020003 - Proposed Expansion of Heathrow Airport (Third Runway)

Mr Barton,

Many thanks for the below confirmation.

We await a hard copy of the Scoping Report from Heathrow Airport Limited, which we are expecting today. Once we have carried out our initial checks we will publish the Scoping Report on our website and send notification letters (including links to the Scoping Report) to the relevant statutory consultation bodies, as defined in The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, for comment. All such consultees will have a 28 day period within which to provide comments.

Kind regards,
The Planning Inspectorate

From: Steve Barton [mailto:BartonS@ealing.gov.uk]
Sent: 18 May 2018 09:14
To: Expansion of Heathrow Airport (Third Runway)
Subject: Re: TR020003 - Proposed Expansion of Heathrow Airport (Third Runway)

Yes it is. For information I'm the councils Strategic Planning manager and have been lead officer for the council on Heathrow Strategic Planning Group.

Are you able to send me the EIA scoping report which I understand HAL have tabled. I understand that we have 4 weeks to give you any comments or feedback?

Kind regards,

Steve Barton

Sent from my iPhone

On 17 May 2018, at 16:21, Expansion of Heathrow Airport (Third Runway) <HeathrowAirport@pins.gsi.gov.uk> wrote:

> Dear Sirs,
>
> Heathrow Airport Limited has notified the Planning Inspectorate (the Inspectorate) that it will be seeking a Scoping Opinion from the Inspectorate, on behalf of the Secretary of State, as to the information to be provided in an Environmental Statement relating to the proposed Expansion of Heathrow Airport (Third Runway).
>
> The Inspectorate has identified you as a consultation body which must be consulted before adopting its Scoping Opinion, and understands that the Applicant has been in direct contact with you in relation to this.
>
> Please can you therefore confirm that this is the correct email address to be used by the Inspectorate for all correspondence in relation to the upcoming consultation prior to the adoption of a Scoping Opinion.
>
> Kind regards,
>
> The Planning Inspectorate, Temple Quay House, Temple Quay, Bristol BS1 6PN
> Helpline: 0303 444 5000
> Web: www.gov.uk/government/organisations/planning-inspectorate (The Planning Inspectorate)
> Twitter: @PINSgov
>
> This communication does not constitute legal advice.
> Please view our Information Charter before sending information to the Planning Inspectorate.

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creating a better place

Environment Agency

Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN

Our ref: NE/2018/128660/01-L01
Your ref: TR020003

Date: 19 June 2018

Dear Sir/Madam

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (The EIA Regulations) – Regulations 10 and 11

Application by Heathrow Airport Limited (the Applicant) for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the Proposed Development)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

Heathrow Airport Hounslow, Middlesex, TW6 1QT

Thank you for consulting us regarding our opinion as to the information to be provided in the Environmental Statement (ES) relating the proposed expansion of Heathrow airport.

We have reviewed the Environmental Impact Assessment (EIA) Scoping report comprising Volume 1 – Main Report; Volume 2 – Figures; and Volume 3 - Appendices with regards to our remit.

The Environment Agency vision is to create great places for living that bring communities together and improve physical and mental wellbeing. We have a key role in delivering and enabling infrastructure which helps to protect people and the environment. We are a delivery body, and regulator on a range of flood and coastal erosion risk, environmental, and energy infrastructure; the competent body for the Water Framework Directive (WFD); and an advisor on climate change resilience and spatial planning.

We are a statutory consultee under the Planning Act 2008 upon submission by the Applicant of the application for a Development Consent Order (DCO) for the Expansion of Heathrow Airport (Third Runaway). We are also currently engaging with the Applicant on a non-statutory basis and we wish to continue to do so up to the submission of the DCO application.

Cont/d..

Our early engagement with the Applicant will ensure the range of environmental issues and their interactions with the development are taken into account so that better and at pace outcomes and opportunities are achieved with greater certainty during the DCO process.

We have provided the main points of our response below and provided detailed comments as Appendix 1.

Environment Agency Position

We broadly agree with the Applicant's proposed scope of the Environmental Impact Assessment (EIA). We specifically agree that the following environmental topics should be included and carefully assessed in the EIA and/or the Preliminary Environmental Information Report (PEIR): Biodiversity, Climate change, Land quality and Water. We strongly support the Applicant's commitment to achieve environmental net gain. This is a principle included in The Government's Environment Plan; A Green Future: Our 25 Year Plan to Improve the Environment.

The scale of the project in this location combined with both the quality and sensitivity of the environment in this location means that the project may present significant risks to the environment. It will therefore be imperative that baseline conditions are adequately established and agreed with all relevant parties. At this point in time the Applicant is yet to share all baseline condition survey with us or agree baseline study methodologies. This will be key to ensuring that the risks to the environment are fully understood, avoided, mitigated or compensated for.

We are also currently not clear which environmental permits the Applicant will be seeking from us for activities regulated under the Environmental Permitting Regulations. This will be important in informing us of which specific activities should be in scope of the EIA and/or PEIR and the level of detail we would expect to be included in these documents and inform any protected provisions we would seek to be included in the DCO, should the Secretary of State grant consent for the scheme. We encourage the Applicant to begin more detailed conversations with us on these matters at the earliest opportunity.

After we have formally agreed the scope to establish baseline agreement we will need to begin discussions and agree the scope for the Applicant's post-consent monitoring. This will clearly be required to ensure any agreed design principles have been followed, mitigation measures have been implemented, habitat creation has been successful and established as planned. We would have liked the Applicant to include more information and for us to have a better understanding of these proposals within these consultation documents.

We agree that the Biodiversity and Water topics will be assessed for all design components of the DCO Project and for both the construction and operation phase. We do not think that it is appropriate that for the Airport supporting facilities component of the DCO Project, climate change has been considered as an environmental topic to be scoped in only for the Energy generation plant. Most Airport supporting facilities outlined within Table 3.7 in Chapter 3 are infrastructure and assets that could be affected by climate change impacts. We consider that all Airport supporting facilities should be scoped in as a potential receptor to the impacts of future climate change. This is justified as the consequence and impacts of climate change can affect the Airport support facilities resilience to the impacts of climate change and therefore potentially impact on operation and potentially safety of staff and visitors, which may be the case

Cont/d..

when considering increased flood risk as a result of climate change.

Our comments above and included in Appendix 1 are based on our available records and the information as submitted to us. We thank you for consulting us on this scoping opinion and welcome you to review our detailed comments. If you have any queries please feel free to contact Phillip Petrou at phillip.petrou@environment-agency.gov.uk

Yours faithfully

[redacted]

Phillip Petrou
Environment Programme Manager
Hertfordshire & North London Area

Att:

Appendix 1 – Detailed comments

End

Appendix 1

Chapter	Paragraph/table	Environment Agency Comments
Chapter 4 Approach to EIA scoping	Table 4.6 Summary scope of the assessment – Environmental topic 'Water'	We note the 7. Increased sediment loading to surface water will be assessed only during the construction phase. We recommend this is assessed also during the operation phase as sediment from the increased impermeable area washing off into the rivers and drains will still occur after the construction phase, albeit at lower volumes. There is also no mention of connectivity change between surface water and groundwater. These changes are mentioned separately, however, there could be a change in the connectivity between the surface water and groundwater at various locations. We note the possibility of contamination of the groundwater and the impact on public water supply network are mentioned respectively within 13. Changes to groundwater quality and 15. Impacts on the capacity of the local public water supply network. However, there is no mention of the possibility of contaminating public (groundwater) water supply.
Chapter 6 Biodiversity	Table 6.1 Policy and legislation relevant to biodiversity assessment	We recommend the EU Water Framework Directive is included as a relevant piece of legislation.
	Paragraph 6.6.15 Open Water	Clarifications should be provided as to when river / stream becomes a ditch with regard to Main River and ordinary watercourse classification.
	Table 6.10 Likely effect requirement assessment	Within the activity 'Re-alignment, diversion of rivers and streams' the impacts to riparian habitat and lateral connectivity should be included within the effects requiring an assessment.
	Paragraph 6.9.7	Clarifications should be provided as to why a deviation from the *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal* (2016) produced by the Chartered Institute of Ecology and Environmental Management (CIEEM) is proposed for ecological features that are of local or negligible importance. The implications/risks of this should be assessed and provided.

Chapter 18 Water Environment	Paragraph 18.1.3 footnote 2	Within the 'definition' of groundwater there is no mention of pathways of groundwater, only bodies of groundwater. There will be some known pathways between Surface Water and GW and through the groundwater system.
	Table 18.4 Water environment data sources	Please note you should request from the neighbouring Local Planning Authority (LPAs) data relating to the identification of the functional floodplain (flood zone 3b) and its boundaries within the LPAs Strategic Flood Risk Assessments (SFRAs).
	Paragraph 18.5.4	Clarification should be provided as to: • why the baseline field surveys have been completed to an extent and/or whether the field work element has been underestimated; • how it has been ascertained that the desk study data available is adequate; Please note many, if not all of the catchments within the project boundary are not the most gauged or monitored. There are a lot of unknowns in terms of flows and volumes of water across this complex River Basin.
	Paragraph 18.6.39	This paragraph states: *The likely maximum volume of water discharged would be limited by control structures that bound individual canal reaches, such that it is unlikely to prevent a major risk to flooding in the vicinity of the Project.* We believe it should reading: ... *such that it is unlikely to present a major risk to flooding in the vicinity of the Project.*
	Paragraph 18.6.45	It is noted here that "water supply to the current site is provided by Affinity Water". Please note that there are two abstraction licences held by Heathrow Airport Limited (TH/039/0028/007 and 28/39/31/0185/R01) which enable non-potable water to be used on site for specific purposes, and within the permitted volumes. There are additional conditions associated with the use of this water which should be adhered to. This information is detailed on the relevant licence document, a copy of which can be requested by the Licence Holder if required.
	Table 18.8 Likely significant effects requiring assessment	The Receptor WE10: Upper River Colne should be included within Activity "Change in Land use" and "River Diversion" and linked effect "Changes to channel morphology (operation only) The requirement to review the impacts of the proposed expansion on Water Supply and Foul Drainage is detailed within this table under specifically within the activities "water

		use during construction and operation", "discharge to sewers during construction" and "operation of drainage system". It is noted that the potential effect could be "increased water demand from the site in the construction and operation phases effecting the sustainability of supply in the local water resource zone". Whilst it is positive to note this is being 'scoped into' the EIA, it is expected that any increase in potable water use for the operational phase of the expansion will not delay or prevent Heathrow Airport Limited from achieving the targets and metrics set out in Heathrow 2.0. Affinity Water's supply zone is classified as an area of 'Serious' water stress, highlighting the need to use resources efficiently and reduce water consumption in this area. It is expected that new buildings would be configured to ensure sustainable use of water including water recycling schemes to reutilise non-potable water for appropriate activities, rainwater harvesting from impermeable surfaces (if water is deemed to enter a 'source of supply' then this would become a licensable activity) and installation of water efficient appliances. As a major commercial activity in this region, we would expect Heathrow to operate responsibly, setting an example for other airports and companies to follow. It would be consistent to utilise Heathrow 2.0 to understand and maintain Heathrow's current commitments to water resources. This should be incorporated into the Assessment A7: Resource Management Plan detailed in Table 18.11 - Assessments supporting the assessment of effects on water environment receptors in the construction and operational phases
	Table 18.10 Site baseline data collection and surveys	• 'River Accretion profiles – More details should be provided on: ▪ Which points are part of the accretion profile? ▪ What was measured and how? ▪ How was the timing chosen? ▪ Are 3 surveys for each site enough? • 'Continuous flow and level gauging – More details as to what equipment, where, why, for how long and how should be provided. Additionally, if new 'continuous

		flow gauging' is to be installed, what sort of time frame is being proposed? It can take years for a good rated section to be set up and gauged in order for reliable flows to be calculated. • Geomorphological walkover – These where undertaken in 2017 and 2018. Any others planned?
	Paragraph 18.10.9	We recommend that the Code of Construction Practice (CoCP) is also used for maintenance standards as this will aid in ensuring compliance for WFD and other legislation.
	Table 18.15 Definitions of water environment magnitude of change	It is noted that the "water environment assessment will be divided into a number of assessment years covering the current baseline, future baseline (without the DCO Project), enabling works, construction phase(s) and operational phases of the development". It is positive to see specific reference to the "future baseline (without the DCO Project)", this is expanded further within Paragraph 18.9.8 and, in particular, the consideration of the "inclusion of works being undertaken to improve the condition of the watercourses in line with WFD objectives". However, the intention does not appear to be a consistent application of this approach. Table 18.15 details the criteria and associated examples for each of the magnitudes of change (High, Medium, Low & Negligible). Both High and Medium reference WFD within their examples, indicating that a High and Medium magnitude of change would be a "downgrading of WFD status (deterioration in current thresholds as defined by current WFD status, including supporting elements)". If the water environment assessment is considering a future baseline (without the DCO Project), then the criteria for assessing the magnitude of change should be consistent and have regard to the future baseline. In addition, the emphasis of WFD is to prevent deterioration and secure Good Ecological Status/Potential for these water bodies. Therefore, it is expected that the 'deterioration' of a water body's status would be considered a significant change, and assessed appropriately as High. Additionally, it is detailed within the Medium criteria examples, that the "Water quality status may impact upon potential future thresholds in relation to objective WFD status – potential for water body reaching its future WFD objectives". Please note that it is not

		only the water quality status which may impact on a water body's ability to reach future WFD objectives, as the classifications are built from a number of elements which should be given equal regard. The intention is to achieve Good Ecological Status/Potential for all WFD water bodies. Therefore, the consideration of a possible failure of a water body to achieve its future WFD objective as a 'Medium' definition of change is inconsistent with this intention. We consider that this is a High magnitude of change, and should be updated accordingly within the criteria.
	Paragraph 18.10.8	It is disappointing to see that the "mitigation approach will seek to avoid deterioration of the current ecological conditions around the airport" rather than working to the future baseline referenced in Paragraph 18.9.6 and what these water bodies would achieve without implementation of the DCO Project.
Appendix 6.1 Biodiversity Method Statements	Section 11.3 Field surveys – Paragraph 11.3.8	Please note that more than three electro-fishing runs may be necessary to obtain the necessary depletion to result in a worthwhile analysis.
	Section 11.3 Field surveys – Paragraphs 11.3.11 to 11.3.13	More detailed reference for the use of new techniques like eDNA should be provided.
Appendix 6.2 Biodiversity desk study report	Table 6.2.8 Habitats of Principal Importance	The River Crane (Priority Habitat) and the River Colne (Priority for Restoration) should be included within table 6.2.8. Please note that Natural England guidelines on riverine priority habitat classifies Priority for Restoration in the same way as Priority Habitat.
Appendix 18.1 Water Framework Directive Compliance Assessment methodology	Paragraph 5.2.3	It is noted in this paragraph that the water body status and status objectives information for the relevant WFD water bodies in the Assessment Area have been derived from the Thames RBMP. Please note that the published data are from the 2015 RBMP. There is an interim classification due for release in 2019, and we recommend this data is used when available.
	Paragraphs 5.2.13 and 15.2.14	It is stated that 'temporary flow gauges will be installed on 11 water courses. Detailed information on where, when, how? For what levels and and/or flows would need to be provided.

	Paragraph 5.2.15	It is stated here that two rounds of flow accretion surveys will be undertaken along all water bodies. It is unclear whether these surveys are the same as the ones indicated within Table 18.10 in Chapter 18 Volume 1. Flow accretion surveys are useful in WFD to understand the nature, volume, of flows and where they go etc. Clarification should be provided on how these surveys are carried out.
	Table 18.1.2 Data sources to inform the WFD assessment, and purpose	An important data source is the latest information which can be found on Catchment Data Explorer (CDE). This should be included and referenced throughout when completing the WFD Compliance Assessment. Please note, CDE is frequently updated.
	Paragraph 5.2.8 Hydromorphology Surveys	There is reference to "targeted detailed surveys of a number of watercourses that are judged by the Environment Agency to be in good condition will also be undertaken specifically to inform mitigation solutions and provide proxy conditions for future baseline" (The intention of this statement and understanding of the context for 'good condition' is unclear. This does need to be clarified as the EIA progresses.
	Paragraph 5.2.9 Aquatic Ecology Walkover Surveys and Section 5.2.10 Ecological Monitoring	The scope for these surveys should include identification and mapping of in-channel and riparian invasive plants. Whilst it's acknowledged that relevant species will be identified during macrophyte, macroinverterbrate and fish surveys, these won't cover the full water body length. Therefore, this should also be incorporated into the walkover surveys to help inform the risks of channel conversions and site operations within multiple catchments, and appropriate mitigation.
	Paragraph 5.1.19	This paragraph details that "the data collected from both sets of monitoring will be used to provide information on the status of the WFD water bodies". This may relate to the groundwater monitoring detailed immediately above. Regardless of which monitoring it does relate to, it's important to emphasise that the status of WFD water body will not change as a consequence of monitoring for the purposes of Heathrow expansion. The Status will be reported as an outcome of triennial classification, with the next interim update released in 2019 and in 2022. The Environment Agency is constantly working with our partners and stakeholders to prevent deterioration and seek improvements to the water bodies. Therefore, the statuses may change and the most up to date information should be reviewed and referred to as it becomes available.

	Table 18.1.4	There are inconsistencies in the defined Assessment Areas which are provided in both Chapter 18: Water Environment and in this Appendix 18.1. Chapter 18 details a "Wider Surface Water Study Area" in Table 18.3 which "incorporates the wider catchment extent of the Colne and Crane operational catchments beyond the local study area…from their source to the Thames". This is reflected in the Receptor Groups detailed in Table 18.7 where WE10: Upper River Colne details "The full catchment of the River Colne and its tributaries". However, the water bodies listed in Table 18.1.4 in Appendix 18.1 does not contain the full list of tributaries for the River Colne and the water bodies which form the Colne Operational Catchment. Furthermore, there are water bodies which detail additional and relevant extents of the Grand Union Canal which haven't been included. It is unclear as to the reasons for these inclusions/exclusion. However, it is advised that the table is revised to take account of these omissions. Information on the appropriate water bodies can be found on the Catchment Data Explorer (CDE).
	Paragraph 7.2.2	Reference is made to the provision of "some working definitions…to understand the significance of spatial impact and therefore inform a conclusion on the risk of activity causing deterioration". We expect to be consulted on and have very early sight of these definitions as they emerge and are formulated.
	Paragraph 7.2.3	Please define a short period of time. The recover without the need for any mitigation should also be time bound. For example, recovery without mitigation over 20 years would not be acceptable.
	Paragraph 7.4.7	Calculating length of impact as a percentage of 1:50,000 OS river network within the WFD water body catchment may not be an appropriate method to understand importance of impact at a waterbody scale as length of river does not equate to ecological importance as different lengths will have different quality and connectivity. The intention of the WFD Compliance Assessment is to determine the likely impact that this proposal will have with regard to WFD. At a water body scale, this relates to ensuring no deterioration of the affected water bodies or their ability to achieve their future target WFD objective. This will be based and assessed on monitoring which occurs on the WFD 'blue line'. Therefore, whilst connectivity and the wider catchment

		water environment, including tributaries, are extremely important, it does not feel appropriate to represent risk and/or improvements as a percentage of the wider river network. The 'blue line' defines the extent against which WFD assessment and performance are monitored and should be used to measure risk and permanent/temporal impacts. If the proposed approach is taken forward, we would need reassurances that this would not compromise/conflict with our obligations to protect and enhance these water bodies under WFD. Additionally, this needs to be reflected in the definitions of 'likely impact' where this approach has introduced inconsistencies between the methodology and terms. This is because the scale of impact on the "status of/for the quality element", which would have been classified according to the WFD 'blue line', is determined according to the percentage of impact on a river network which includes non-WFD river. It is assumed that "quality element" refers to all elements which are assessed under WFD and are used to build classifications, rather than just the water quality elements.
	Paragraph 7.4.9	Percentage of waterbody length is an old method from historic WFD guidance. A 100 metres stretch may be important spawning habitat for the waterbody. If the preferred method is a percentage method, it should be as a percentage of similar quality and habitat type in the waterbody but this level of data is not available.
	Paragraph 7.4.14	Sensitivity of reach will require baseline information of the whole waterbody being effected to understand reaches sensitivity in relation to waterbody extent. If it is proposed to use 1:50,000 river network, then baseline information on this full network will be required. Otherwise, it will be down to professional judgment and consultation with us through design and mitigation phases.
Appendix 18.3 Surface water quality modelling Method Statement	Table 18.3.2 Data sources and description	It is unclear whether the 'Accretion FLOW data – flow in the stream attributable to seepage GW discharge – field monitoring, is the same accretion work as mentioned by other parts of the scoping report.

From:	ESP Utilities Group Ltd
To:	Expansion of Heathrow Airport (Third Runway)
Subject:	Your Reference: TR020003. Our Reference: PE136206. Plant Affected Notice from ES Pipelines
Date:	22 May 2018 11:30:40

Heathrow Airport
The Planning Inspectorate

22 May 2018

Our Ref: PE136206
Your Ref: TR020003

Expansion of Heathrow Airport (Third Runway).

Dear Sir/Madam,

Further to your enquiry received on 22/05/2018, I can confirm that ES Pipelines Ltd and ESP Electricity Ltd may be affected by the proposed works in the area of Expansion of Heathrow Airport (Third Runway). ES Pipelines Ltd and ESP Electricity Ltd has gas and electricity networks serving the area in question (Reference **1910/PPS14182, 9001996, 9010719, 9011467, ESN010136, ESN010646, ESN012771, ESN014490, ESN017240, ESN017939, ESN019292, ESN019472, 245/PPS6412, ESPE0428, ESPE0567, ESPE0954, ESPE1023**) at grid reference E507459, N175694 and security of supply is vitally important.

Due there being so many networks, project drawing as laids for these sites will be sent separately but for your information a location drawing which shows the approximate locations of the gas and electricity networks within your utility search boundary, is enclosed. Over time it is fairly unlikely that these existing networks will expand and that any proposed new development within the perimeter line will be subject to planning permission regulations.

As your plans for the proposed work develop you are required to keep ES Pipelines Ltd and ESP Electricity Ltd regularly updated about the extent and nature of your proposed works in order for us to fully establish whether any additional precautionary or diversionary works are necessary to protect our networks.

Arrangements can be set in place so that one of our representatives can meet on site (date to be agreed) and we will be happy to discuss the impact of your proposals on the networks once we have received the details.

A list of precautionary measures is attached for your information. This must be passed on to the appointed contractors carrying out the work and any other associated parties.

ESP are continually constructing new gas and electricity networks and this notification is valid for 90 days from the date of this letter. If your proposed works start after this period of time, please re-submit your enquiry.

If you wish to discuss the matter further please contact myself or the team on 01372 587500, alternatively you can email us at PlantResponses@espug.com.

Yours faithfully,

Alan Slee
Operations Manager

Bluebird House
Mole Business Park
Leatherhead
KT22 7BA
☎ 01372 587500 01372 377996

http://www.espug.com

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PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK IN THE VICINITY OF ELECTRICITY CABLES

ADVICE TO SITE PERSONNEL

MANAGEMENT NOTE

Please ensure that a copy of this note is read by your site management and to your site operatives.

Early consultation with ESP Electricity Ltd prior to excavation is recommended to obtain the location of plant and precautions to be taken when working nearby.

This has been produced after consultation with and at the request of the Health and Safety Executive, the construction industry and the electricity companies.

1.0 Introduction

This procedure should be read in conjunction with the ESP Electricity Distribution Safety Rules and other relevant procedures. The object of this procedure is:

a) To lay down the rules for the location of cable before work is started.

b) To specify the safe working procedure to be adopted by persons who have to work on or in the vicinity of cables.

2.0 Reference

ESP Electricity G81 – Design and Planning
ESP Electricity G81 – Installation and Records
National Joint Utilities Group (NJUG) Guidance Notes
Avoiding danger from underground services HSG47 HSE Advice Booklet.

3.0 Work

3.1 All cables and apparatus to which the cables are connected shall be treated as being live, until they have been proved dead and all points of isolation have been establish and controlled.

3.2 All work carried out under this procedure shall also be carried out in strict accordance with the ESP Electricity Distribution Safety Rules and other relevant procedures.

3.3 For the purpose of this procedure:

a) Work on a cable includes the intentional cutting or removal of its Sheath or Armour, cutting of its core(s) or conductor(s) and the removal of a spiking gun.

b) Work in the vicinity of a cable includes digging or any activity carried out at any work location where cables are or may be present, whether or not for the specific purpose of preparation for work on a cable.

4.0 Cable Locating Devices

4.1 An approved cable locating device is to be used on every occasion before any surface is removed or any digging is started. It must also be used during the course of any digging work.

4.2 Cable location devices provide information on the position of cables. They must not be used as the only means of cable location.

4.3 Cable locating devices must be regularly checked for correct operation.

All persons using cable locating devices must be adequately trained in their use and must be Competent Persons.

5.0 Location of Cables

5.1 The depth of underground cables varies greatly. It is essential that a site specific risk assessment is undertaken for the proposed work you are planning this must include obtaining an up-to-date map of the electricity cables in the area and to make use of it. The electricity cable records must be checked before any work is started. Changes in surface level or reference points, and work carried out by other people may affect the reliability of these records. Anybody excavating must be told of these possibilities.

5.2 Before the start of any excavation work, a cable locating device shall be used to establish the run of live cables. Reasonable steps should be taken to establish the runs of cables both along and across the length of the intended area of digging. The cable avoidance tool shall be used together with mains records and where provided, service records.

5.3 All cable runs either confirmed by use of the cable locating device or indicated on the mains records must be marked out on the surface using a waterproof marker. Marked cable runs must be extended 300mm beyond either end or side of the intended digging area, and must stay visible while the digging is going on. The trial hole dig method can be used to identify the run of cables using hand dig tools only.

6.0 Precautions to be Taken while Working in Vicinity of Cables

6.1 Work in the vicinity of cables must be carried out as if the cables are live and all excavation work must be personally supervised by a Competent Person. All persons shall wear a minimum of safety footwear, Safety Glasses, hard hat, Task Specific Gloves flame retardant overalls.

6.2 Approved hand tools should always be used in preference to power tools in the vicinity of cables, unless site conditions make this impracticable. Spades should always be used in preference to forks. Extreme care must always be taken when using a fork or pick. Forks must be of approved type with shortened chisel ended tines. Spades must have sharp corners of the blade rounded. The selection of a fork or pick will be assessed on a Task Specific Risk Assessment.

6.3 A proprietary air digging tool, which removes oil with a high-velocity jet of air, can be used to expose buried services without damage to the service. However, it will not penetrate asphalt, concrete or frozen ground. Also precautions need to be taken that will prevent injury to the operator and members of the public from ejected soil and other materials.

6.4 When site conditions require the use of hand held power tools they must be fitted with a short bit. The following method of work must be used:

a) Using all the information provided, together with an approved cable locating device, the line of all know cables must be marked out at least 300mm past the hole that will be dug using waterproof marker.

b) Encroachment lines must be drawn 300mm parallel to and away from the outer and innermost cable marker lines. And as in (a) above these must be drawn to extend at least 300mm beyond the edge of the hole that will be dug.

c) Hand held power tools must not be used below ground level in between the encroachment lines. Hand tools must be used for progressive and careful undermining from outside the encroachment lines towards the cable(s). Hand power tools must only be used to break up any hard surface, keeping pace with, but not going past the undermining. Extreme care must, in particular, be exercised when using power tools above cables already exposed by undermining. The use of power tools must stop if at any time the cutting rate quickens, indicating softer ground. At all times, attention must be paid to the cable run marker lines outside the edges of the holes.

d) The safe digging procedure in (c) above must be followed until all cable(s) required for work or for identification have been located.

e) If all recorded or detected cables inside the digging area have been located then hand held power tools may be used below ground level to break up concrete or similar structures, but even then only when site conditions render the use of hand tools impractical.

6.5 During excavation, full use must be made of cable locating devices which must be used to assist in establishing the exact location of live cables.

6.6 Where exposed cables are likely to be damaged in any way they shall be adequately protected and/or supported. Where in the opinion of the person in charge on site it is appropriate, warning notices must be attached to cables e.g. ‘live cable exposed above ground level’ or ‘live coiled cables’.

6.7 Irrespective of the color of the electricity cable it shall be considered as being in a ‘live’ status unless it has been confirmed and proven that the cable has been physically isolated or turned off.

If damage is caused or suspected the following action should be taken at once:

- Remove all personnel from the immediate vicinity
- Contact ESP Electricity 01372 227560 or out of hours Emergency contact Number 0800 731 6945
- Prevent any approach by the public.
- Assist electricity personnel, Police or Fire Service as requested.

REMEMBER - IF IN DOUBT, SEEK ADVICE FROM ESP Electricity Ltd.

ESP Electricity Ltd can be contacted at:

Office Address: Hazeldean, Station Road, Leatherhead, Surrey, KT22 7AA

Office Tel: 01372 227560**; Fax:** 01372 377996**; email:** plantresponses@espipelines .com

E S PIPELINES LIMITED

PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK IN THE VICINITY OF UNDERGROUND GAS PIPES

ADVICE TO SITE PERSONNEL

MANAGEMENT NOTE

Please ensure that a copy of this note is read by your site management and to your site operatives.

Early consultation with ES Pipelines Ltd prior to excavation is recommended to obtain the location of plant and precautions to be taken when working nearby.

This note has been produced after consultation with and at the request of the Health and Safety Executive, the construction industry and the local authorities as an interim measure pending the issue of an HSE Guidance Note.

Introduction

Damage to ES Pipelines Ltd's plant can result in uncontrolled gas escapes which may be dangerous. In addition these occurrences can cause expense, disruption of work and inconvenience to the public.

Various materials are used for gas mains and services. Cast Iron, Ductile Iron, Steel and Plastic pipes are the most widely found. Modern Plastic pipes are either bright yellow or orange in colour.

Cast Iron and Ductile Iron water pipes are very similar in appearance to Cast Iron and Ductile Iron gas pipes and if any Cast Iron or Ductile Iron pipe is uncovered, it should be treated as a gas pipe. ES Pipelines Ltd do not own any metallic gas pipes but their gas network infrastructures may be connected to Cast Iron, Ductile Iron or Steel pipes owned by Transco.

The following general precautions apply to Intermediate Pressure (2-7barg MOP), Medium Pressure (75mbarg-2barg MOP), Low Pressure (up to 75mbarg MOP) and other gas mains and services likely to be encountered in genera! site works and are referred to within this document as '**pipes**'.

Locating Gas Pipes

It should be assumed when working in urban and residential areas that gas mains and services are likely to be present. On request, E S Pipelines Ltd will give approximate locations of pipes derived from their records. The records do not normally show the position of service pipes but their probable line can be deducted from the gas meter position. E S Pipelines Ltd's staff will be pleased to assist in the location of gas plant and provide advice on any precautions that may be required. The records and advice are given in good faith but cannot be guaranteed until hand excavation has taken place. Proprietary pipe and cable locators are available although generally these will not locate plastic pipes.

Safe working Practices

To achieve safe working conditions adjacent to gas plant the following must be observed:

Observe any specific request made by E S Pipelines Ltd's staff.

Gas pipes must be located by hand digging before mechanical excavation. Once a gas pipe has been located, mechanical excavation must proceed **with care**. A mechanical excavator must not in any case be used within 0.5 metre of a gas pipe and greater safety distances may be advised by E S Pipelines Ltd depending on the mains maximum operating pressure (MOP).

Where heavy plant may have to cross the line of a gas pipe during construction work, the number of crossing points should be kept to a minimum. Crossing points should be clearly indicated and crossings at other places along the line of the pipe should be prevented.

Where the pipe is not adequately protected by an existing road, crossing points should be suitably reinforced with sleepers, steel plates or a specially constructed reinforced concrete raft as necessary. E S Pipelines Ltd staff will advise on the type of reinforcement necessary.

No explosives should be used within 30 metres of any gas pipe without prior consultation with E S Pipelines Ltd.

E S Pipelines Ltd must be consulted prior to carrying out excavation work within 10 metres of any above ground gas installation.

Where it is proposed to carry out piling or boring within 15 metres of any gas pipe, E S Pipelines Ltd should be consulted prior to the commencement of the works.

Access to gas plant must be maintained at all times during on site works.

Proximity of Other Plant

A minimum clearance of 300 millimetres (mm) should be allowed between any plant being installed and an existing gas main to facilitate repair, whether the adjacent plant be parallel to or crossing the gas pipe. No apparatus should be laid over and along the line of a gas pipe irrespective of clearance.

No manhole or chambers shall be built over or around a gas pipe and no work should be carried out which results in a reduction of cover or protection over a pipe, without consultation with E S Pipelines Ltd.

Support and Backfill

Where excavation of trenches adjacent to any pipe affects its support, the pipe must be supported to the satisfaction of E S Pipelines Ltd and must not be used as an anchor or support in any way. In some cases, it may be necessary to divert the gas pipe before work commences.

Where a trench is excavated crossing or parallel to the line of the gas pipe, the backfill should be adequately compacted, particularly beneath the pipe, to prevent any settlement which could subsequently cause damage to the pipe.

In special cases it may be necessary to provide permanent support to the gas pipe, before backfilling and reinstatement is carried out. Backfill material adjacent to gas plant must be selected fine material or sand, containing no stones, bricks or lumps of concrete, etc., placed to a minimum depth of 150mm around the pipes and well compacted by hand. No power compaction should take place until 300 mm of selected fine fill has been suitably compacted.

If the road construction is in close proximity to the top of the gas pipe, a "cushion" of selected fine material such as sand must be used to prevent the traffic shock being transmitted to the gas pipe. The road construction depth must not be reduced without permission from the local Highway Authority.

No concrete or other hard material must be placed or left under or adjacent to any Cast Iron pipe as this may cause fracture of the pipe at a later date.

Concrete backfill should not be used closer than 300 mm to the pipe.

Damage to Coating

Where a gas pipe is coated with special wrapping and this is damaged, even to a minor extent E S Pipelines Ltd must be notified so that repairs can be made to prevent future corrosion and subsequent leakage.

Welding or "Hot Works"

When welding or other "hot works" involving naked flames are to be carried out in close proximity to gas plant and the presence of gas is suspected, E S Pipelines Ltd must be contacted before work commences to check the atmosphere. Even when a gas free atmosphere exists care must be taken when carrying out hot works in close proximity to gas plant in order to ensure that no damage occurs.

Particular care must be taken to avoid damage by heat or naked flame to plastic gas pipes or to the protective coating on other gas pipes.

Leakage from Gas Mains or Services

If damage or leakage is caused or an escape of gas is smelt or suspected the following action should be taken at once:

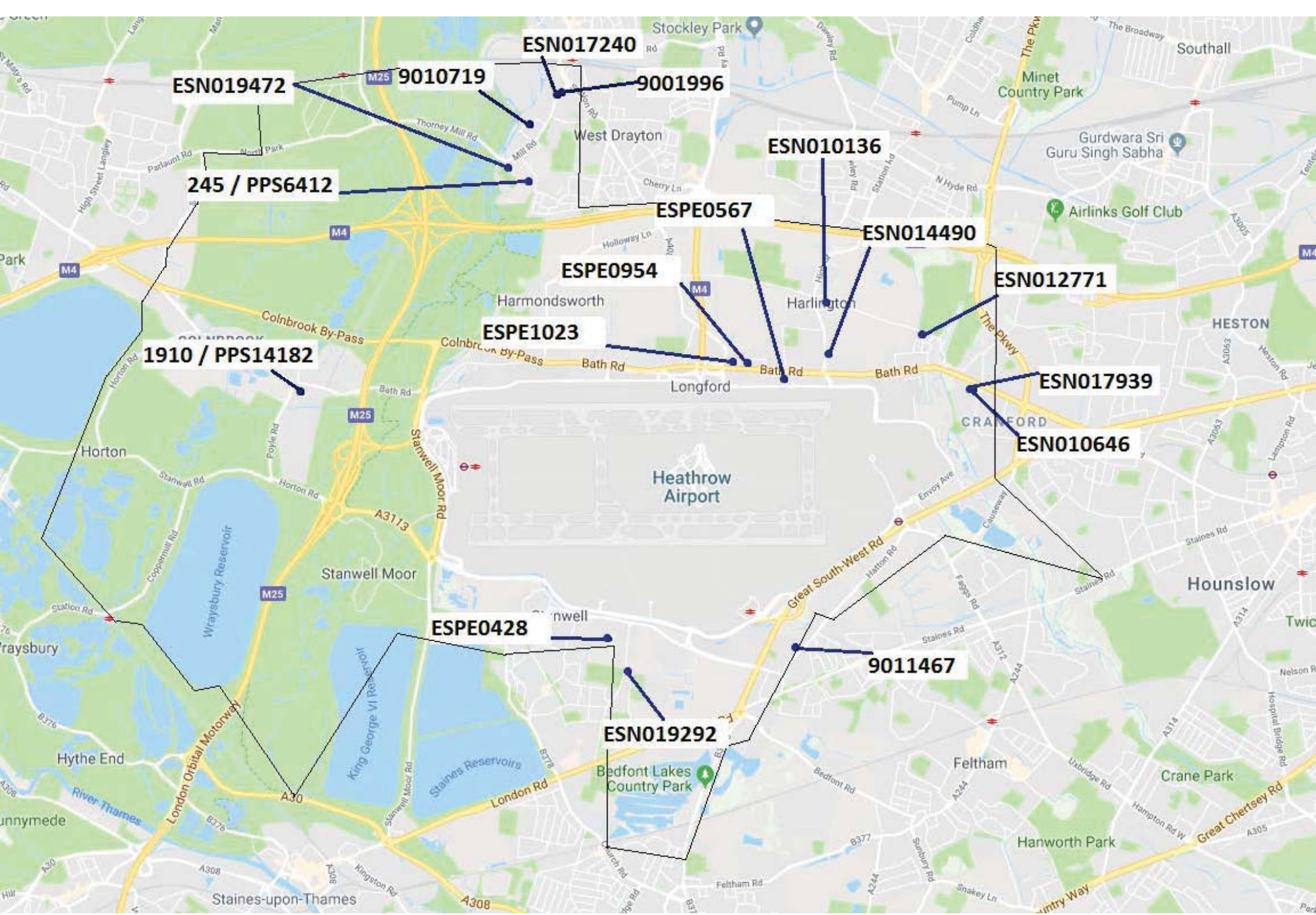
- Remove all personnel from the immediate vicinity of the escape;
- Contact Transco's National Gas Escape Call Centre, on: **0800 111 999**;
- Prevent any approach by the public, prohibit smoking, extinguish all naked flames or other source of ignition for at least 15 metres from the leakage;
- Assist gas personnel, Police or Fire Service as requested.

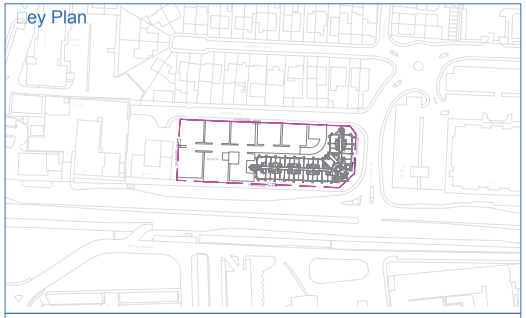
REMEMBER - IF IN DOUBT, SEEK ADVICE FROM E S PIPELINES LTD.

ES Pipelines Ltd can be contacted at:

Office Address: Hazeldean, Station Road, Leatherhead, Surrey, KT22 7AA

Office Tel: 01372 227560**; Fax:** 01372 377996**; email:** plantresponses@espipelines.com


ESN017240
9010719
ESN019472
9001996
245 / PPS6412
ESN010136
ESPE0567
ESN014490
ESPE0954
ESN012771
ESPE1023
1910 / PPS14182
ESN017939
ESN010646
ESPE0428
9011467
ESN019292
Stockley Park
West Drayton
Harmondsworth
Longford
Heathrow Airport
Stanwell Moor
Horton
Wraysbury Reservoir
King George VI Reservoir
Staines Reservoirs
Bedfont Lakes Country Park
Minet Country Park
Gurdwara Sri Guru Singh Sabha
Airlinks Golf Club
HESTON
Hounslow
Feltham
Crane Park
Hanworth Park
Hythe End
Staines-upon-Thames
M4
M25
A3113
A30
A308
Bath Rd
Colnbrook By-Pass
London Rd
Great South-West Rd
Great Chertsey Rd
London Orbital Motorway
Stanwell Moor Rd
The Pkwy

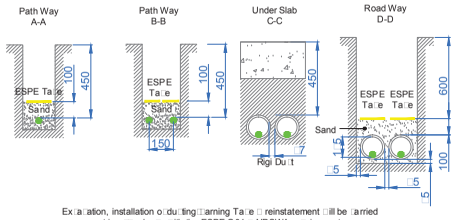


Site Address: Axis House, □4□ Bath Road, Heathro□, UB□ 5A□

Cable Installation Chart			
Cable Type	Max Pulling Tension	Minimum Bending Radius	Minimum Duct Size
300mm² Al Waveform 4c	7000N	1000mm	1□5mm
300mm² Al Waveform 4c LSOH	7000N	1000mm	1□5mm
185mm² Al Waveform 4c	7000N	800mm	1□5mm
185mm² Al Waveform 4c LSOH	7000N	800mm	1□5mm
95mm² Al Waveform 4c LSOH	□000N	650mm	1□5mm
35mm² Al Split Concentric 1c LSOH	Manual	1□5mm	50mm
35mm² Al Waveform 4c LSOH	Manual	□10mm	50mm

Cable Data

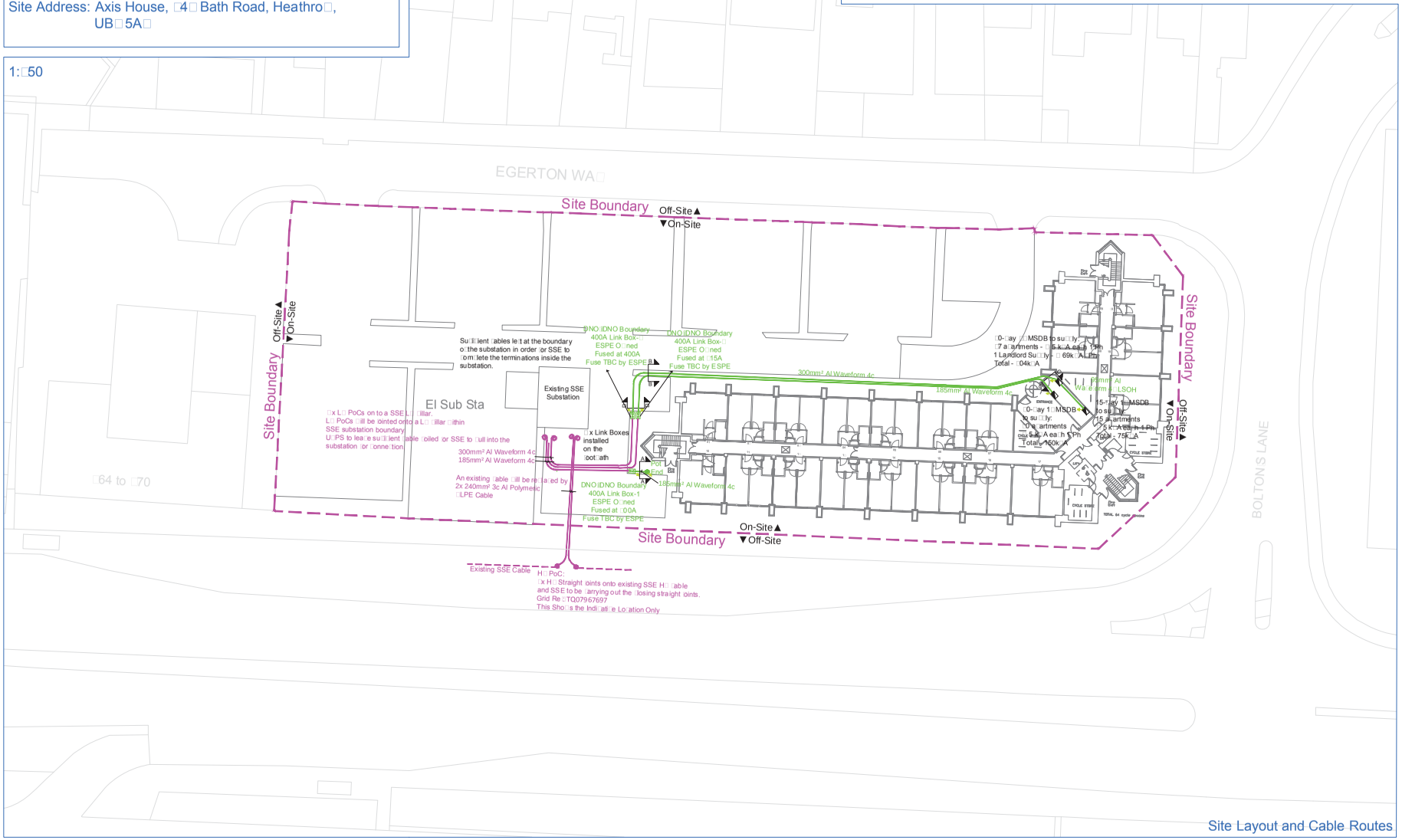
1:16



Ex□a□ation, installation o□ du□ting □arning Ta□e □ reinstatement □ill be □arried out in a□□ordan□e □ith the ESPE G81 □ NRSWA re□uirements.

Tren□h Cross Se□tions

1:□50



Site Layout and Cable Routes

Legend	
	Ne□ L□ Cable
	H□ Point o□ Conne□tion
	DNO E□ui□ment
	Site Boundary
	Earthing
	Link Box
	Existing H□ Cable
	MSDB

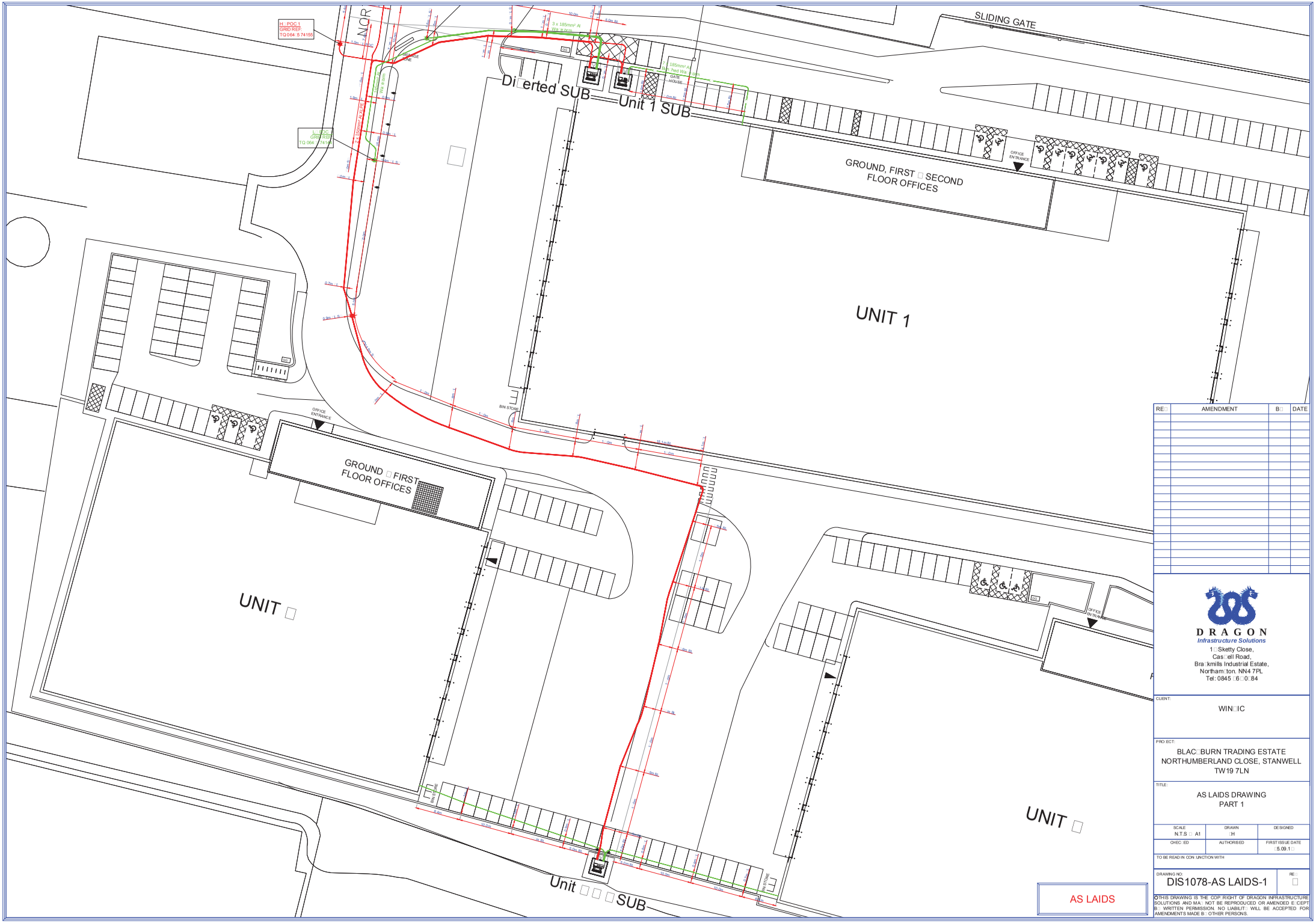
For Pro□e□t S□o□e and Material S□e□i□ations, □lease re□er to U□P□B□□ Pro□e□t In□ormation Do□ument - IDNO

RE□	AMENDMENT	DATE	B□
4	Design U□date	01 07 □15	PZ
□	Design A□□ro□ed	11 06 □15	PZ
□	Design U□date	0□ 06 □15	PZ
1	Design A□□ro□ed	07 04 □15	PZ

UKPOWER SOLUTIONS
Ri□er □ie□ House
Bonds Mill Estate
Stonehouse
Glou□estershire
GL10 □RF

Client	RGB Grou□
Pro□e□t	Axis House
Title	Site Layout and Cable Routes - IDNO
Planning Engineer	Pelin Zahidler
Con□	0845 □57 7105
Pro□e□t Manager	Tony O Hara
Tel No	07896 541 854
Dra□n By	PZ
Che□ked By	PS
Date	18 0□ □015
S□ale	As Sho□n
Sheet No.	1:1
Original Si□e	A1
Dra□ing No.	UKP□□8□□ - DWG800
Re□	4
Do□ument Status	For Design A□□ro□al

Not for Construction



RE□	AMENDMENT	B□	DATE

DRAGON
Infrastructure Solutions
1□ Sketty Close,
Cas□ell Road,
Bra□kmills Industrial Estate,
Northam□ton. NN4 7PL
Tel: 0845 □6□0□84

CLIENT:
WIN□IC

PRO JECT:
BLAC□BURN TRADING ESTATE
NORTHUMBERLAND CLOSE, STANWELL
TW19 7LN

TITLE:
AS LAIDS DRAWING
PART 1

SCALE	DRAWN	DESIGNED
N.T.S □ A1	□H	
CHEC□ED	AUTHORISED	FIRST ISSUE DATE
		□5.09.1□

TO BE READ IN CON□UNCTION WITH

DRAWING NO: DIS1078-AS LAIDS-1 RE□

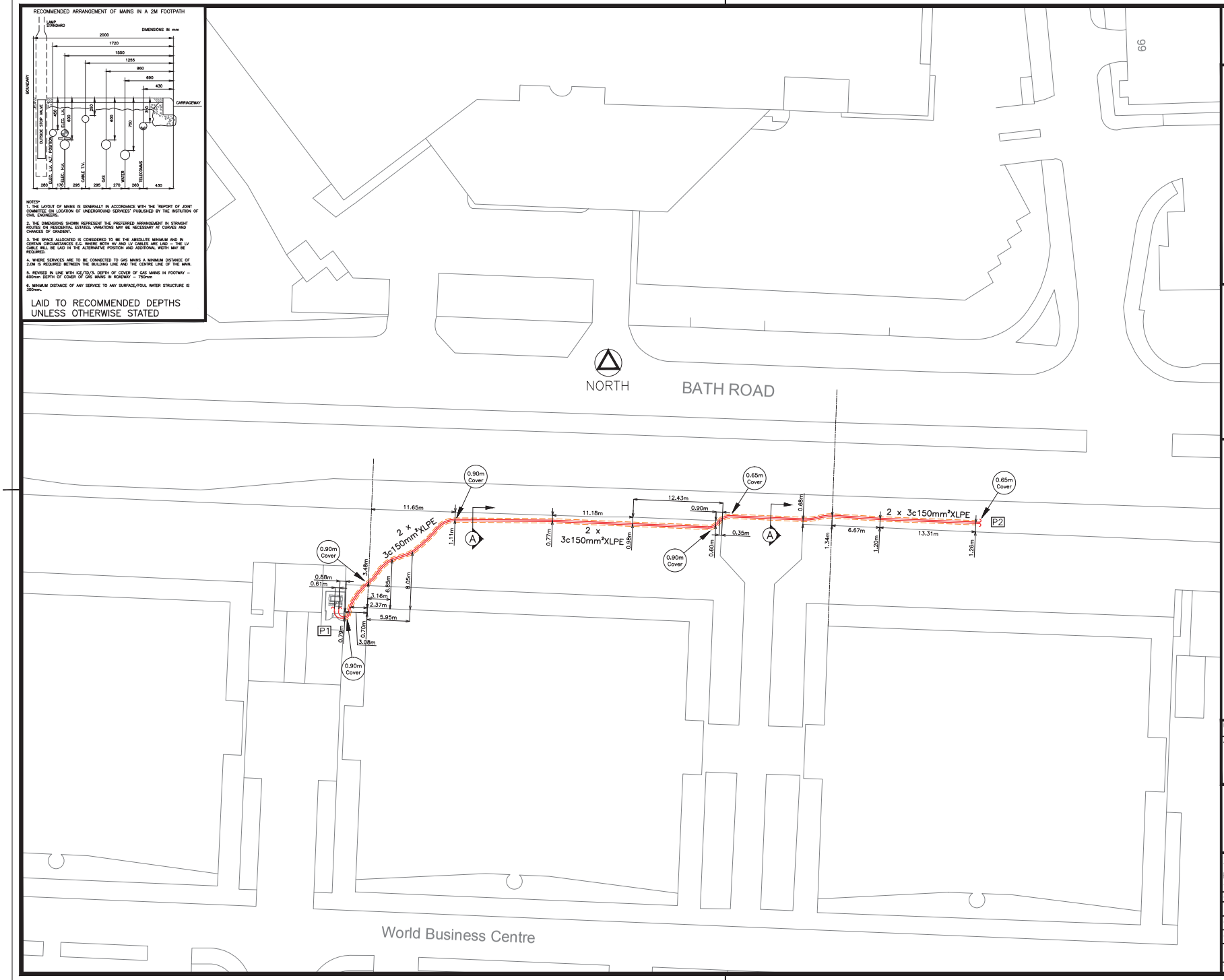
©THIS DRAWING IS THE COP□RIGHT OF DRAGON INFRASTRUCTURE SOLUTIONS AND MA□ NOT BE REPRODUCED OR AMENDED E□CEPT B□ WRITTEN PERMISSION. NO LIABILIT□ WILL BE ACCEPTED FOR AMENDMENTS MADE B□ OTHER PERSONS.

RECOMMENDED ARRANGEMENT OF MAINS IN A 2M FOOTPATH

NOTES*

1. THE LAYOUT OF MAINS IS GENERALLY IN ACCORDANCE WITH THE 'REPORT OF JOINT COMMITTEE ON LOCATION OF UNDERGROUND SERVICES' PUBLISHED BY THE INSTITUTION OF CIVIL ENGINEERS.
2. THE DIMENSIONS SHOWN REPRESENT THE PREFERRED ARRANGEMENT IN STRAIGHT ROUTES ON RESIDENTIAL ESTATES. VARIATIONS MAY BE NECESSARY AT CURVES AND CHANGES OF GRADIENT.
3. THE SPACE ALLOCATED IS CONSIDERED TO BE THE ABSOLUTE MINIMUM AND IN CERTAIN CIRCUMSTANCES E.G. WHERE BOTH HV AND LV CABLES ARE LAID – THE LV CABLE WILL BE LAID IN THE ALTERNATIVE POSITION AND ADDITIONAL WIDTH MAY BE REQUIRED.
4. WHERE SERVICES ARE TO BE CONNECTED TO GAS MAINS A MINIMUM DISTANCE OF 2.0M IS REQUIRED BETWEEN THE BUILDING LINE AND THE CENTRE LINE OF THE MAIN.
5. REVISED IN LINE WITH IGE/TD/3. DEPTH OF COVER OF GAS MAINS IN FOOTWAY – 450mm DEPTH OF COVER OF GAS MAINS IN ROADWAY – 750mm
6. MINIMUM DISTANCE OF ANY SERVICE TO ANY SURFACE/FOUL WATER STRUCTURE IS 300mm.

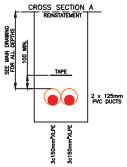
LAID TO RECOMMENDED DEPTHS UNLESS OTHERWISE STATED



0 2.5 5.0 m
A1 PLOT SCALEBAR 1:250m
0 5.0 10.0m
A3 PLOT SCALEBAR 1:500m

AS BUILT KEY:

- HV CABLE:
- LV CABLE:
- EXISTING CABLE:
- CABLE IN DUCT:
- MAINS STRAIGHT JOINT:
- MAINS BREECH JOINT:
- BOTTLE END WITH EARTH:
- SERVICE CABLE
- SERVICE BREECH JOINT/ STREET LIGHTING COLUMN (PLOT / SL)
- TRENCH CROSS SECTION MARKER: A, 0.90m Cover
- DEPTH MARKER:
- POSITION NODE: P1
- PHASE ALLOCATION: L1 L2 L3



AS LAID INFORMATION
Supplied by Matrix ABC Limited
Officer 1-2 Logistics House, St Johns Works, Neville Road, Bradford West Yorkshire BD4 8TL
Matrix ABC Limited – As Builts and Cad
Tel: 01274 733447

STATUS:HV AS BUILT	REV:A
SCHEME: WORLD BUSINESS CENTRE BATH ROAD, HEATHROW	
PROJECT MANAGER:JULIAN HARRIS	

PRINCIPLE QUANTITIES - INFO TO 11.07.14

FROM	TO	SIZE	LENGTH IN m
P1	P2	3c150mm²XLPE	98.5
P1	P2	3c150mm²XLPE	97.8

SURVEYOR:BEN HOWE | CONTACT No:07786738298

Rev.	Description/Details	Rev. Date	Rev. by
A	FIRST ISSUE. SEE PRINCIPLE QUANTITIES.	17.07.14	JAH

Contractor.
matrix networks
Matrix Networks Limited
6500 Daresbury Park
Daresbury, Warrington,
Cheshire
WA4 4GE
Tel: 0844 74 000 74
Fax: 0844 74 000 75

Scheme / Site Name.
WORLD BUSINESS CENTRE
BATH ROAD, HEATHROW

Site Developer.–

Grid Reference.TQ083769

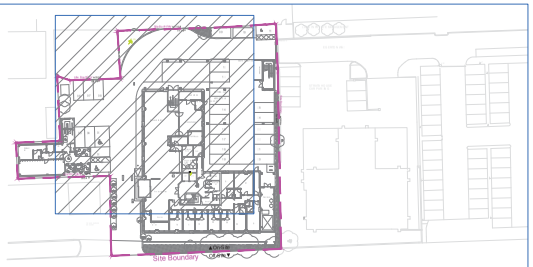
Drawing Status.HV AS BUILT

Contractor Ref. No.MN208713 | IDNO/DNO Ref. No.–

Contractor Dwg.No.MN208713–JAH–001

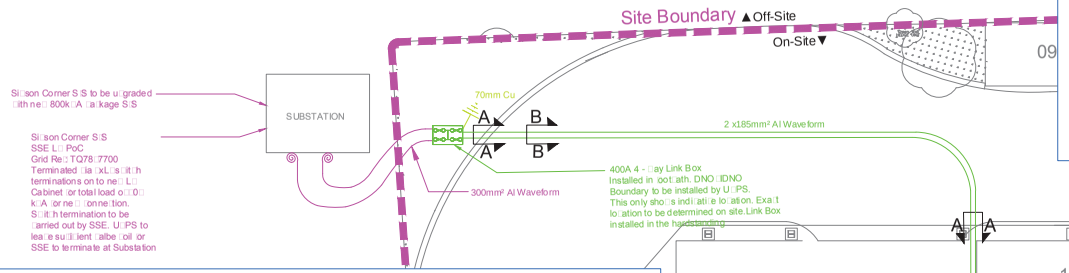
Designed by	Drawn by	Checked by	Approved by	Sheet 1
–	JAH	BAH	–	of 1
Scale 1:250	Orig.Size A1	Date drawn 17.07.2014		Revision A

□ey Plan

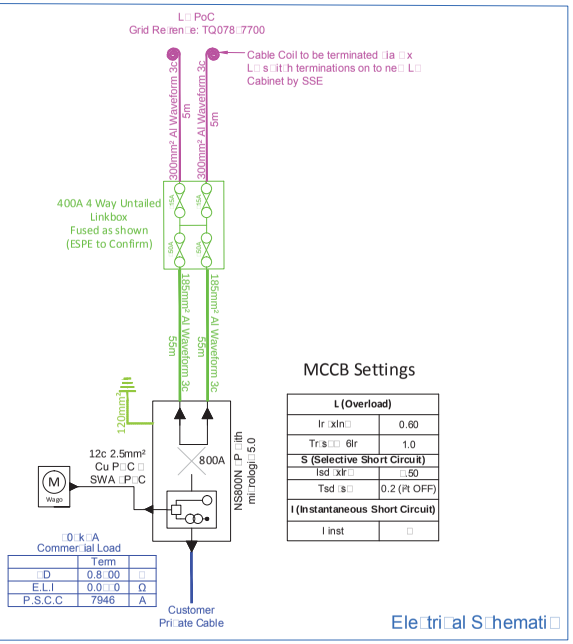


Site Address: □76 Bath Road, Heathro□, UB□ 5□□

1:100



Legend	
	L□ Cable
	L□ Point o□ Conne□tion
	Site Boundary
	Link Box
	DNO E□ui□ment

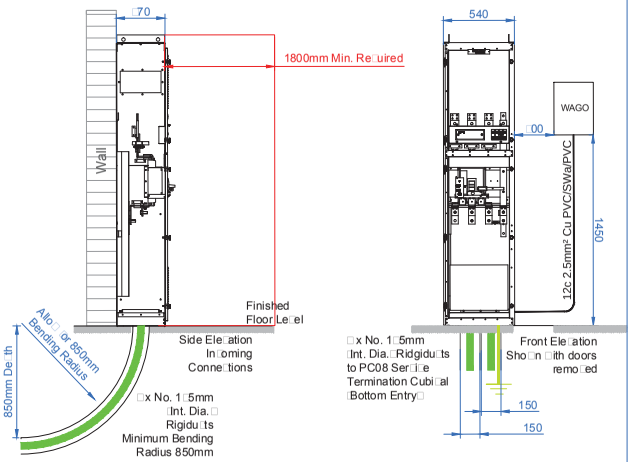


MCCB Settings

L (Overload)	
Ir □xIn□	0.60
Tr□s□□ 6Ir	1.0
S (Selective Short Circuit)	
Isd □xIr□	□.50
Tsd □s□	0.2 (Pt OFF)
I (Instantaneous Short Circuit)	
I inst	□

Ele□tri□al S□hemati□

1:□0

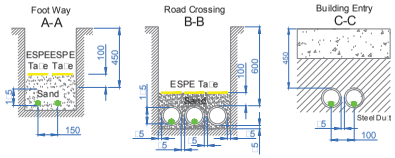


Ser□i□e Termination Cubi□le

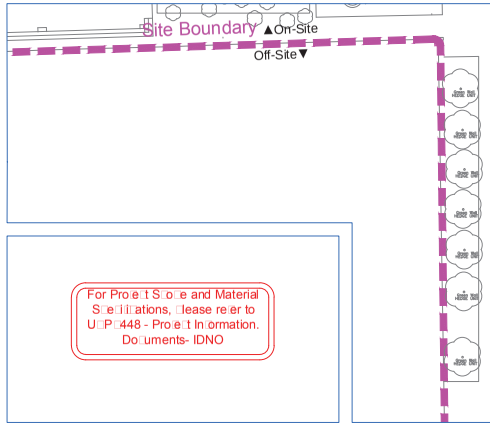
Cable Installation Data			
Cable Type	Max Pulling Tension	Minimum Bending Radius	Minimum Duct Size
185mm² 3c Wavecon	7000N	700mm	1□5mm

Cable Data

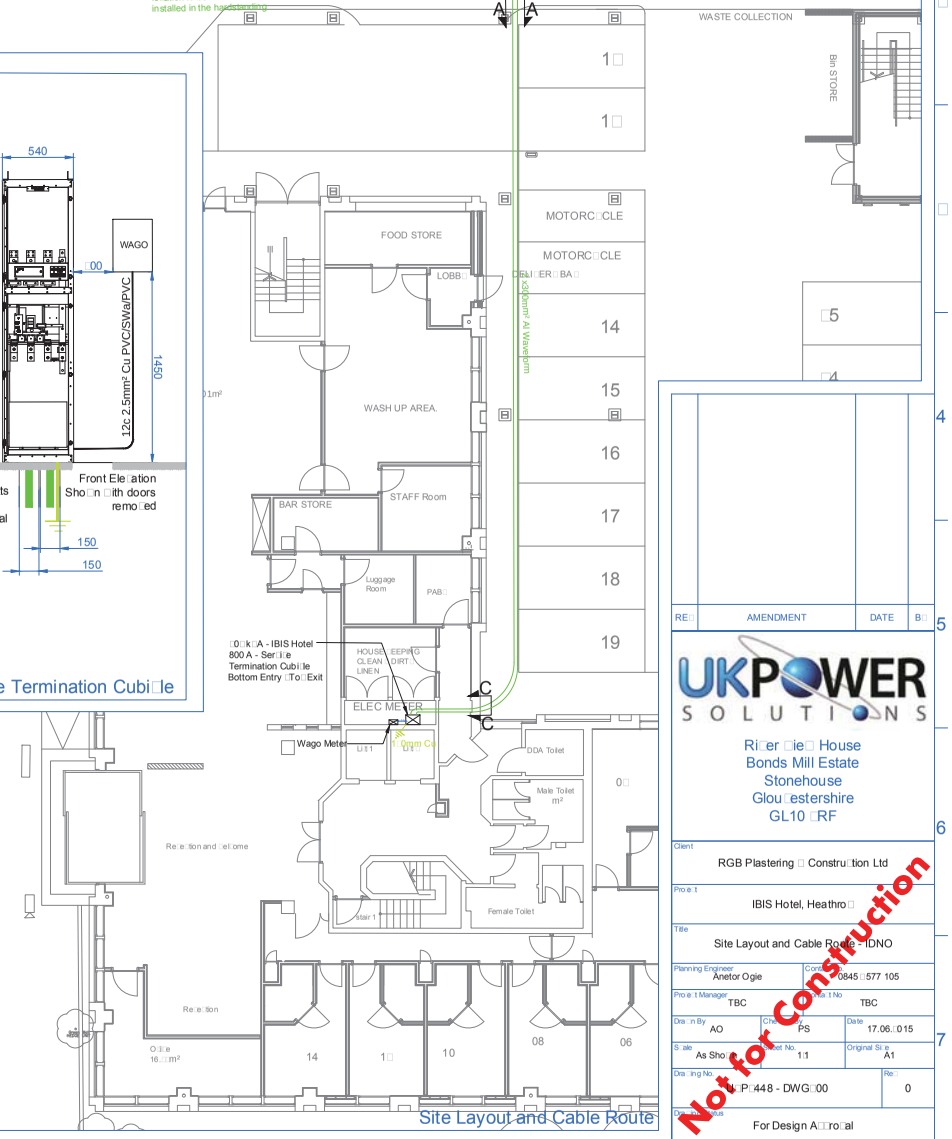
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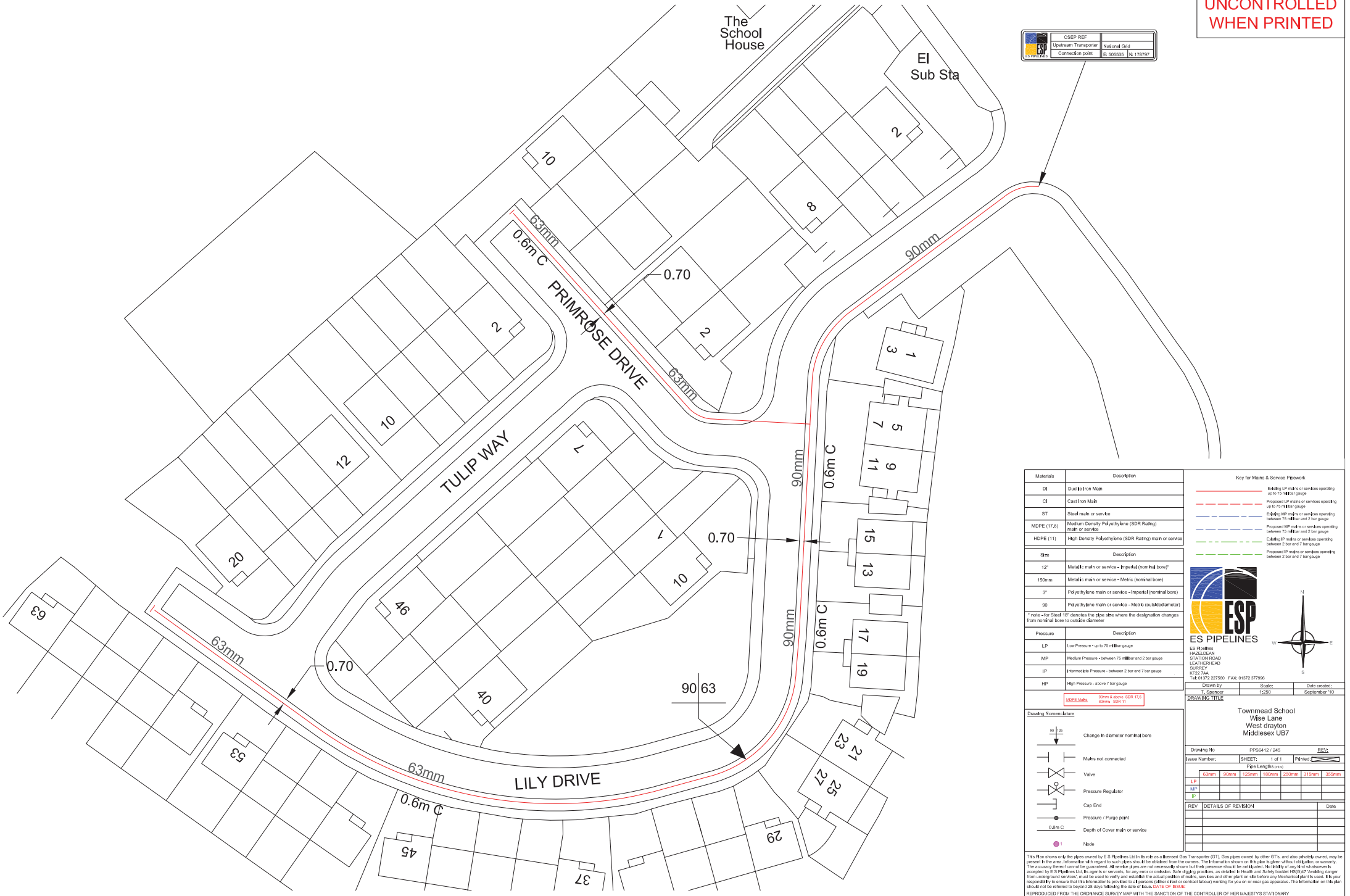
Tren□h Cross Se□tions



For Pro□e□t S□o□e and Material S□e□i□ations, □lease re□er to U□P□448 - Pro□e□t In□ormation. Do□uments- IDNO



UNCONTROLLED WHEN PRINTED



Materials	Description
DI	Ductile Iron Main
CI	Cast Iron Main
ST	Steel main or service
MDPE (17.6)	Medium Density Polyethylene (SDR Rating) main or service
HDPE (11)	High Density Polyethylene (SDR Rating) main or service

Size	Description
12"	Metallic main or service - Imperial (nominal bore)*
150mm	Metallic main or service - Metric (nominal bore)
3"	Polyethylene main or service - Imperial (nominal bore)
90	Polyethylene main or service - Metric (outsidediameter)

* note - for Steel 18" denotes the pipe size where the designation changes from nominal bore to outside diameter

Pressure	Description
LP	Low Pressure - up to 75 mBar gauge
MP	Medium Pressure - between 75 mBar and 2 bar gauge
IP	Intermediate Pressure - between 2 bar and 7 bar gauge
HP	High Pressure - above 7 bar gauge

MDPE Mains: 90mm & above SDR 17.6; 63mm SDR 11

Drawing Nomenclature

- 90 | 125 — Change in diameter nominal bore
- Mains not connected
- Valve
- Pressure Regulator
- Cap End
- Pressure / Purge point
- 0.8m C — Depth of Cover main or service
- 1 — Node

Key for Mains & Service Pipework

- Existing LP mains or services operating up to 75 mBar gauge
- Proposed LP mains or services operating up to 75 mBar gauge
- Existing MP mains or services operating between 75 mBar and 2 bar gauge
- Proposed MP mains or services operating between 75 mBar and 2 bar gauge
- Existing IP mains or services operating between 2 bar and 7 bar gauge
- Proposed IP mains or services operating between 2 bar and 7 bar gauge

ES PIPELINES
ES Pipelines
HAZELDEAN
STATION ROAD
LEATHERHEAD
SURREY
KT22 7AA
Tel: 01372 227560 FAX: 01372 377996

Drawn by	Scale:	Date created:
T. Spencer	1:250	September '10

DRAWING TITLE

Townmead School
Wise Lane
West drayton
Middlesex UB7

Drawing No	PPS6412 / 245	REV:
Issue Number:	SHEET: 1 of 1	Printed:

Pipe Lengths (mtrs)

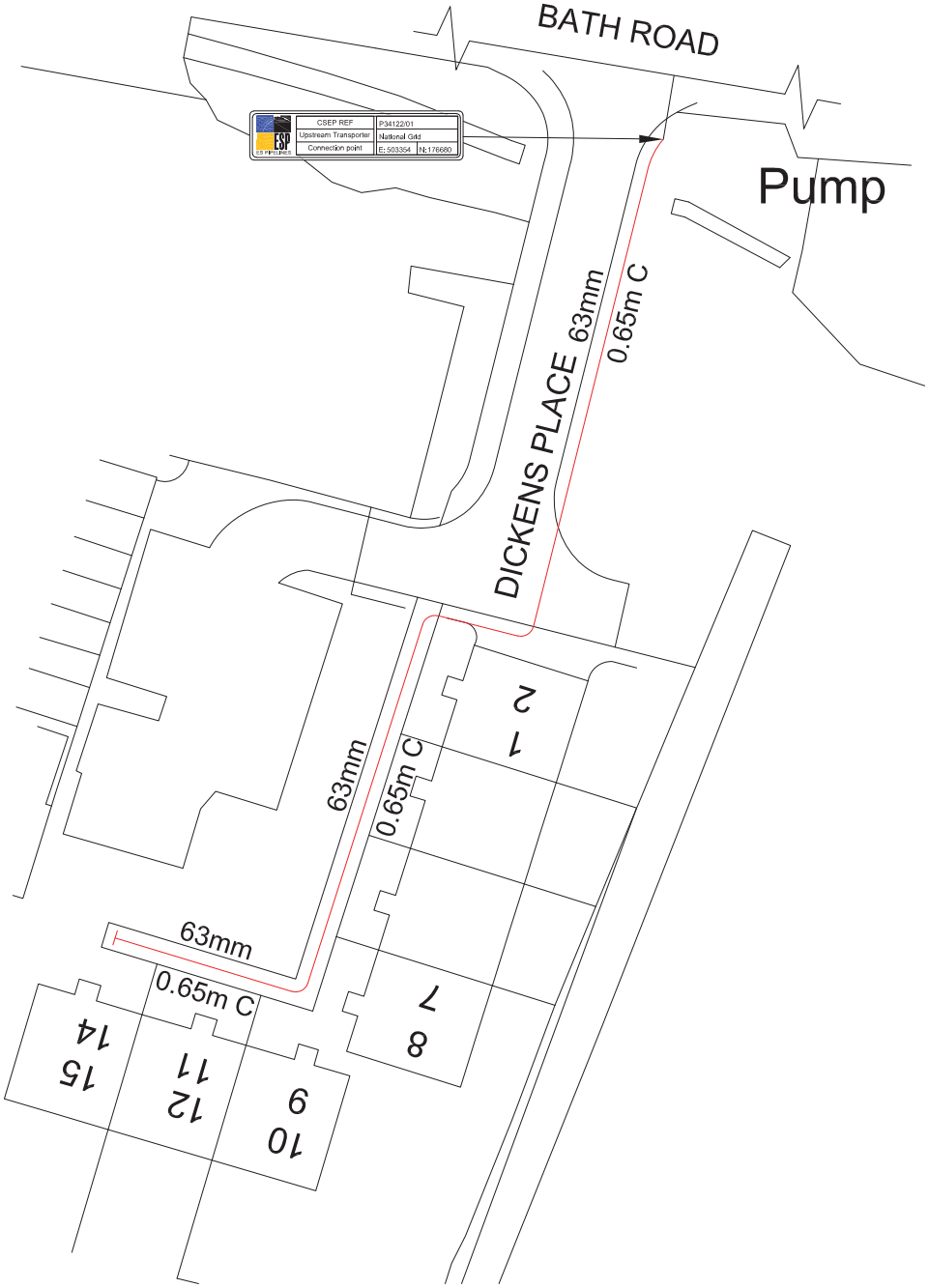
	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP							
MP							
IP							

REV	DETAILS OF REVISION	Date

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Materials	Description
DI	Ductile Iron Main
CI	Cast Iron Main
ST	Steel main or service
MDPE (17.6)	Medium Density Polyethylene (SDR Rating) main or service
HDPE (11)	High Density Polyethylene (SDR Rating) main or service

Size	Description
12"	Metallic main or service - Imperial (nominal bore)*
150mm	Metallic main or service - Metric (nominal bore)
3"	Polyethylene main or service - Imperial (nominal bore)
90	Polyethylene main or service - Metric (outsidediameter)

* note - for Steel 18" denotes the pipe size where the designation changes from nominal bore to outside diameter

Pressure	Description
LP	Low Pressure - up to 75 mbar gauge
MP	Medium Pressure - between 75 mbar and 2 bar gauge
IP	Intermediate Pressure - between 2 bar and 7 bar gauge
HP	High Pressure - above 7 bar gauge

MDPE Mains: 90mm & above SDR 17.6; 63mm: SDR 11

Drawing Nomenclature

- 90 | 125 — Change in diameter nominal bore
- Mains not connected
- Valve
- Pressure Regulator
- Cap End
- Pressure / Purge point
- 0.8m C — Depth of Cover main or service
- 1 — Node

Key for Mains & Service Pipework

- Existing LP mains or services operating up to 75 mbar gauge
- Proposed LP mains or services operating up to 75 mbar gauge
- Existing MP mains or services operating between 75 mbar and 2 bar gauge
- Proposed MP mains or services operating between 75 mbar and 2 bar gauge
- Existing IP mains or services operating between 2 bar and 7 bar gauge
- Proposed IP mains or services operating between 2 bar and 7 bar gauge

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STATION ROAD
LEATHERHEAD
SURREY
KT22 7AA
Tel: 01372 227560 FAX: 01372 377996

N E S W

Drawn by	Scale:	Date created:
M. Hyslop	1:200	July '11

DRAWING TITLE

Bath Road
Slough
Berkshire
SL3

Drawing No	PPS14182 / 1910	REV:
Issue Number:	SHEET: 1 of 1	Printed:

Pipe Lengths (mtrs)

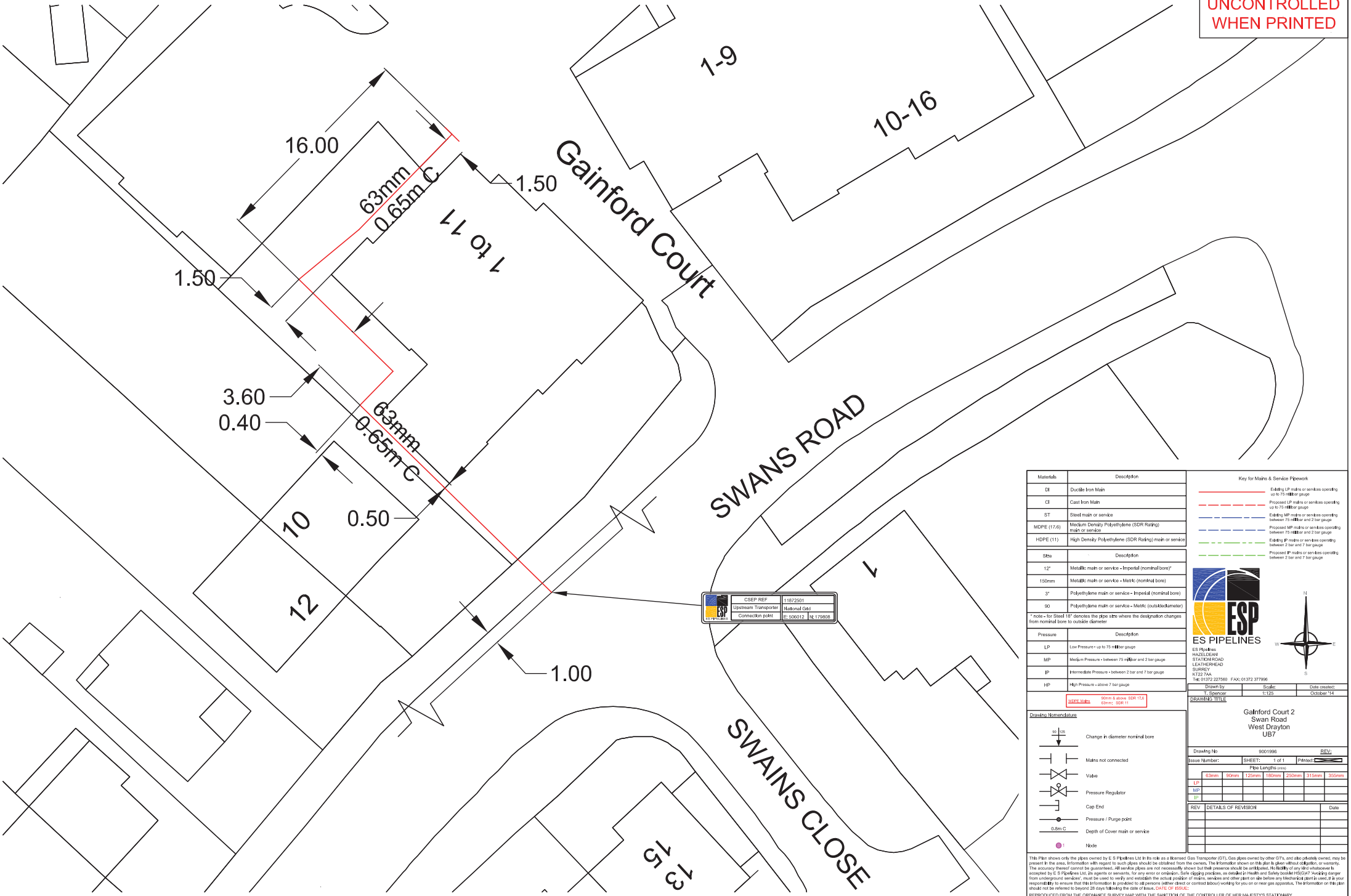
	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP							
MP							
IP							

REV	DETAILS OF REVISION	Date

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Drawing Nomenclature

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- Proposed IP mains or services operating between 2 bar and 7 bar gauge

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LEATHERHEAD
SURREY
KT22 7AA
Tel: 01372 227560 FAX: 01372 377996

Drawn by	Scale:	Date created:
T. Spencer	1:125	October '14

DRAWING TITLE

Galinford Court 2
Swan Road
West Drayton
UB7

Drawing No 9001996 REV:

Issue Number: SHEET: 1 of 1 Printed:

Pipe Lengths (mm)

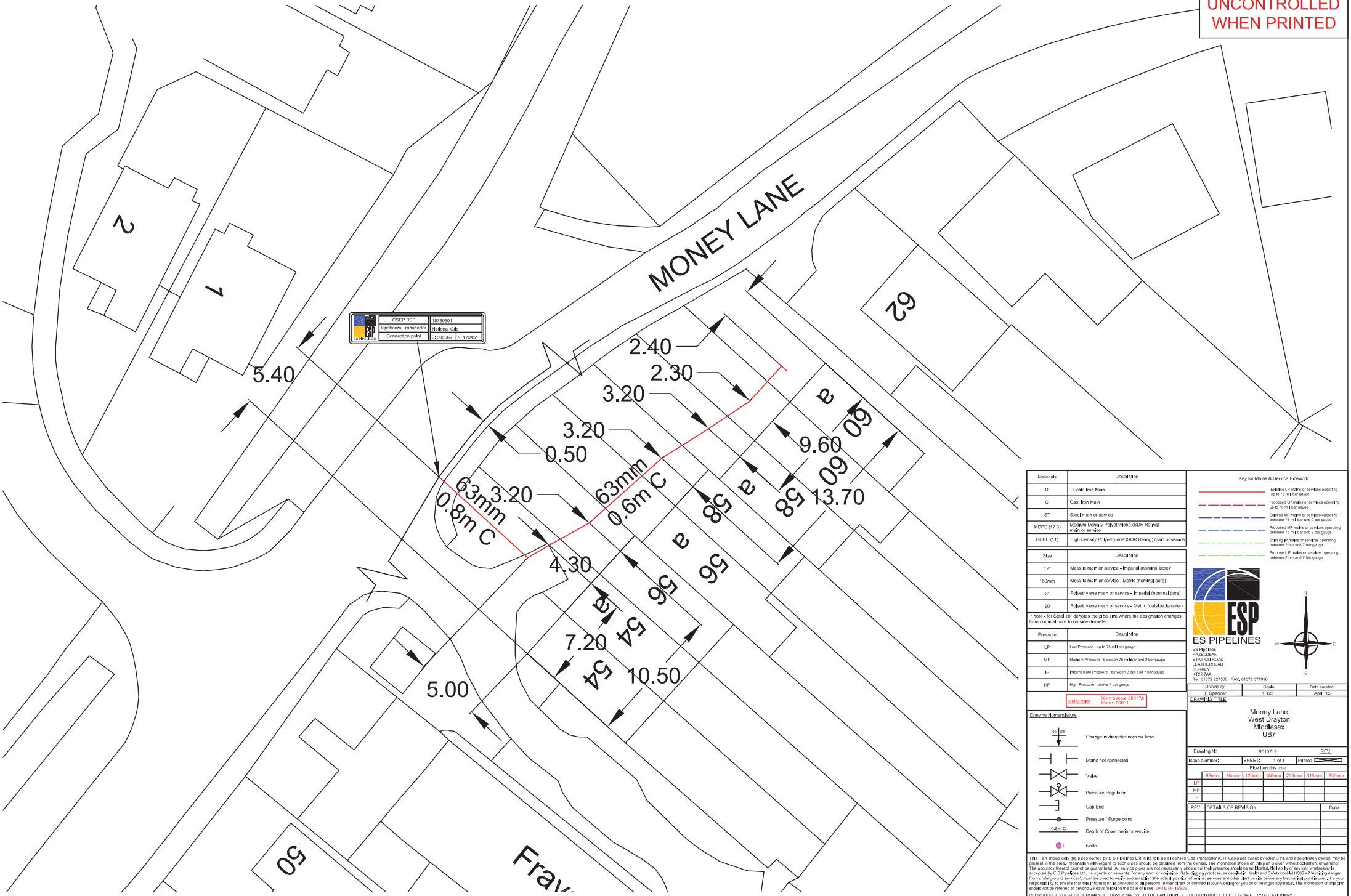
	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP							
MP							
IP							

REV	DETAILS OF REVISION	Date

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Drawing Nomenclature

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Drawn by	Scale:	Date created:
T. Spencer	1:125	April '15

DRAWING TITLE

Money Lane
West Drayton
Middlesex
UB7

Drawing No	9010719	REV:
Issue Number:	SHEET: 1 of 1	Printed:

Pipe Lengths (mm)

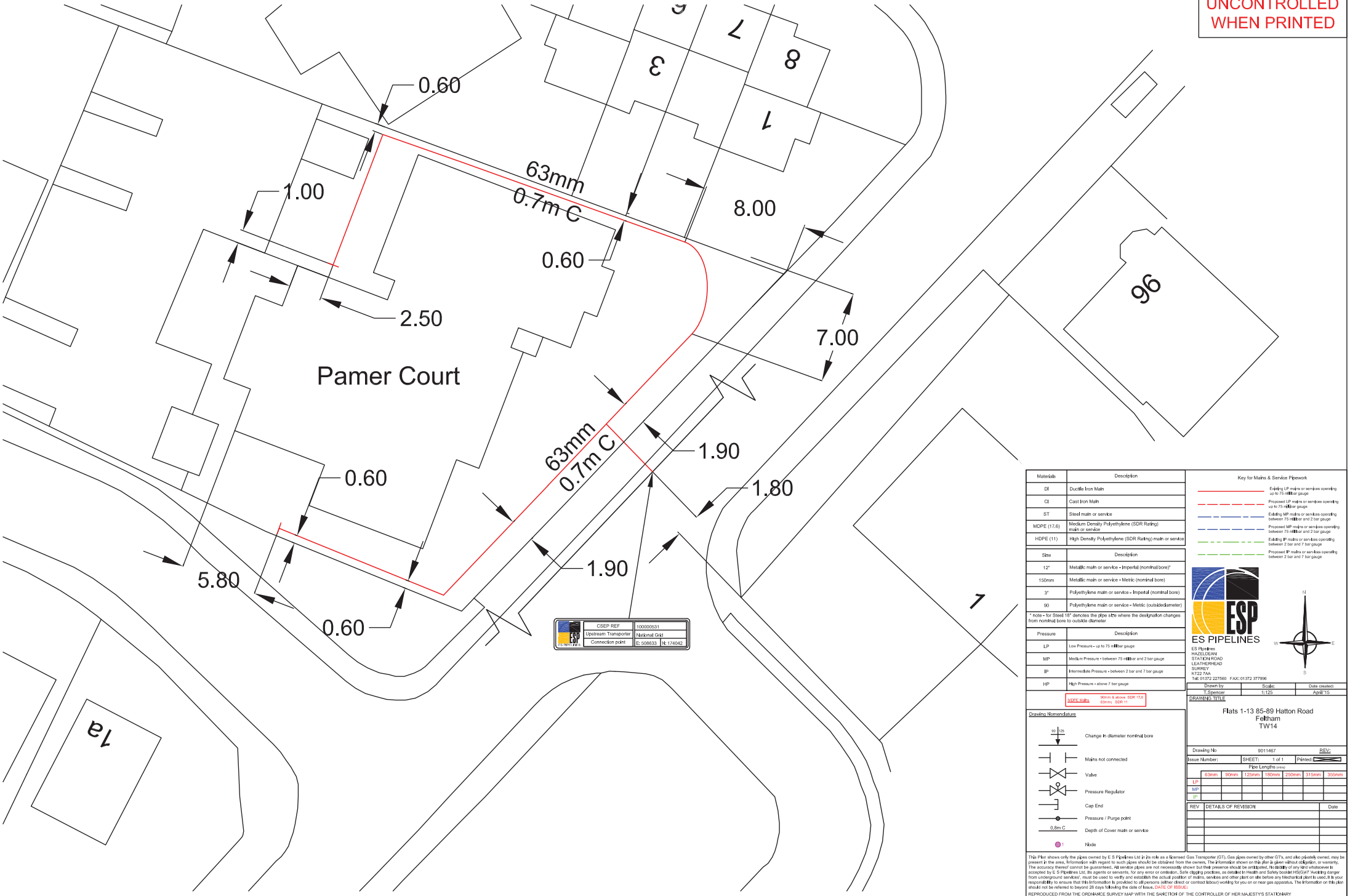
	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP							
MP							
IP							

REV	DETAILS OF REVISION	Date

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MDPE Mains: 90mm & above SDR 17.6; 63mm SDR 11

Drawing Nomenclature

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Tel: 01372 227560 FAX: 01372 377996

Drawn by	Scale:	Date created:
T.Spencer	1:125	April '15

DRAWING TITLE

Flats 1-13 85-89 Hatton Road
Feltham
TW14

Drawing No 9011467 REV:

Issue Number: SHEET: 1 of 1 Printed:

Pipe Lengths (mm)

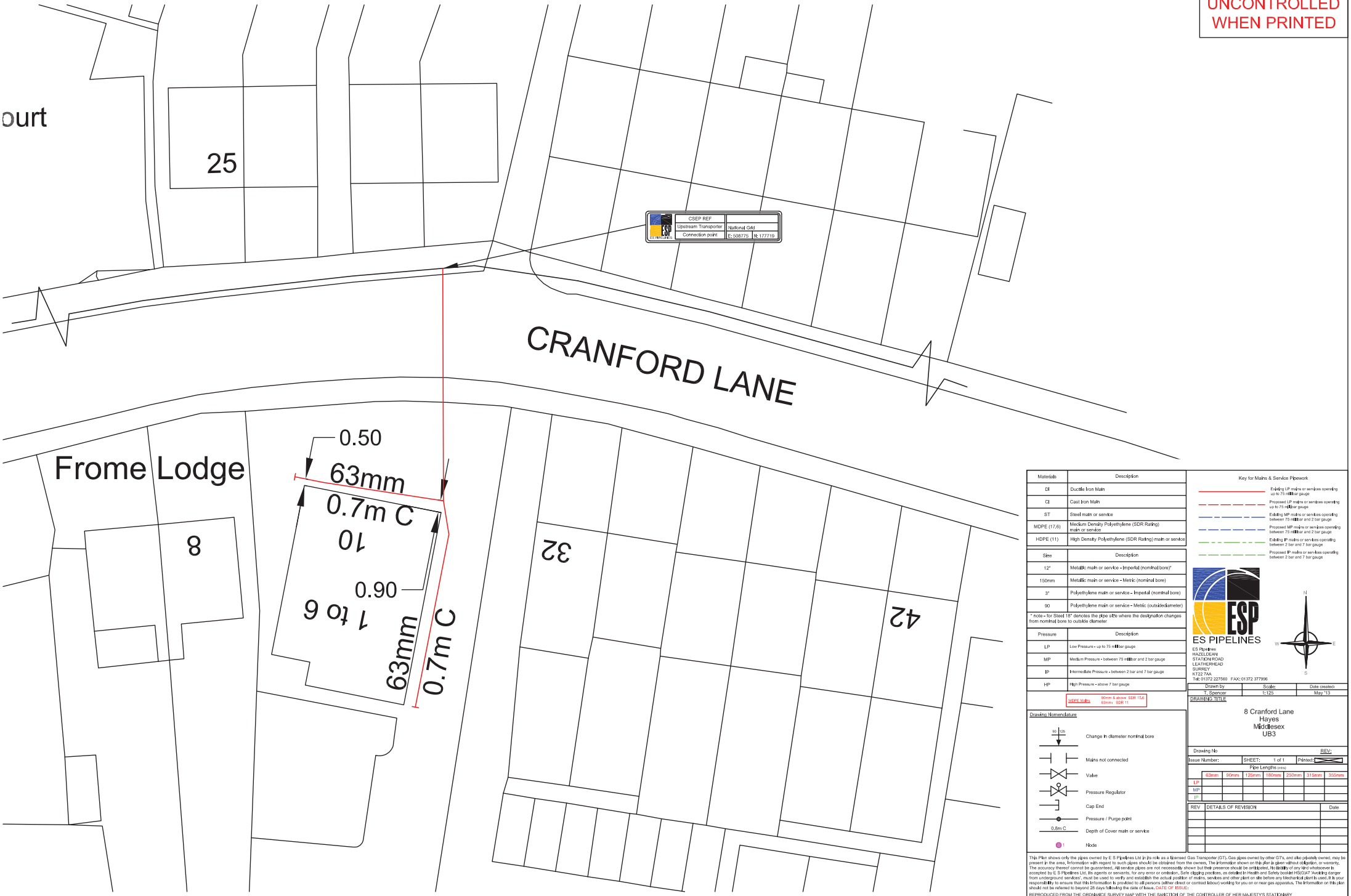
	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP							
MP							
IP							

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MDPE Mains: 90mm & above SDR 17.6; 63mm SDR 11

Drawing Nomenclature

- Change in diameter nominal bore
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KT22 7AA
Tel: 01372 227560 FAX: 01372 377996

Drawn by	Scale:	Date created:
T. Spencer	1:125	May '13

DRAWING TITLE

8 Cranford Lane
Hayes
Middlesex
UB3

Drawing No | REV:

Issue Number: | SHEET: 1 of 1 | Printed:

Pipe Lengths (mm)

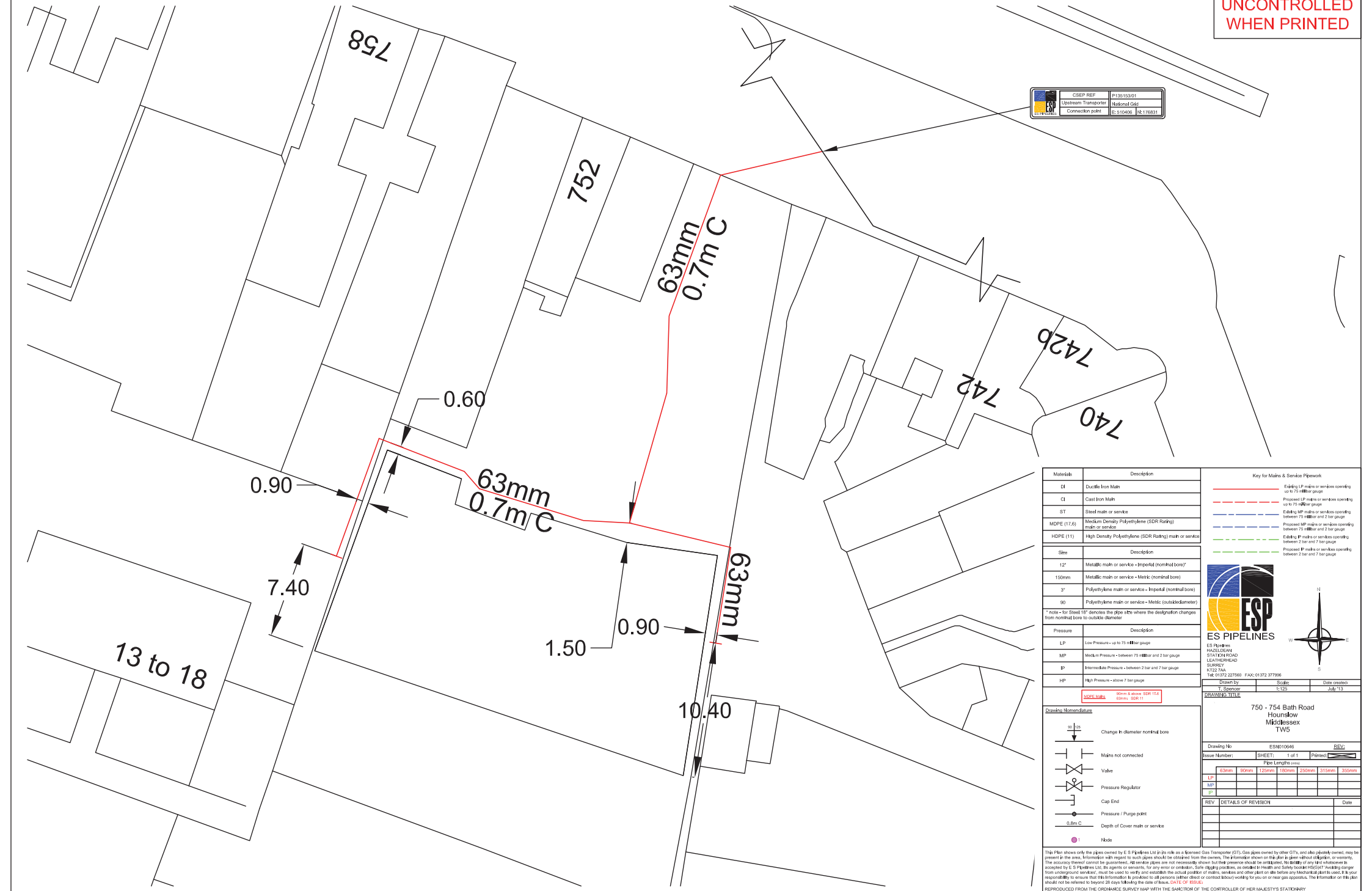
	63mm	90mm	125mm	180mm	250mm	315mm	355mm
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CSEP REF	P135153/01	
Upstream Transporter	National Grid	
Connection point	E: 510406	N:176831

Materials	Description
DI	Ductile Iron Main
CI	Cast Iron Main
ST	Steel main or service
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SURREY
KT22 7AA
Tel: 01372 227560 FAX: 01372 377996

Drawn by	Scale:	Date created:
T. Spencer	1:125	July '13

DRAWING TITLE

750 - 754 Bath Road
Hounslow
Middlessex
TW5

Drawing No	ESN010646	REV:
Issue Number:	SHEET: 1 of 1	Printed:

Pipe Lengths (mm)

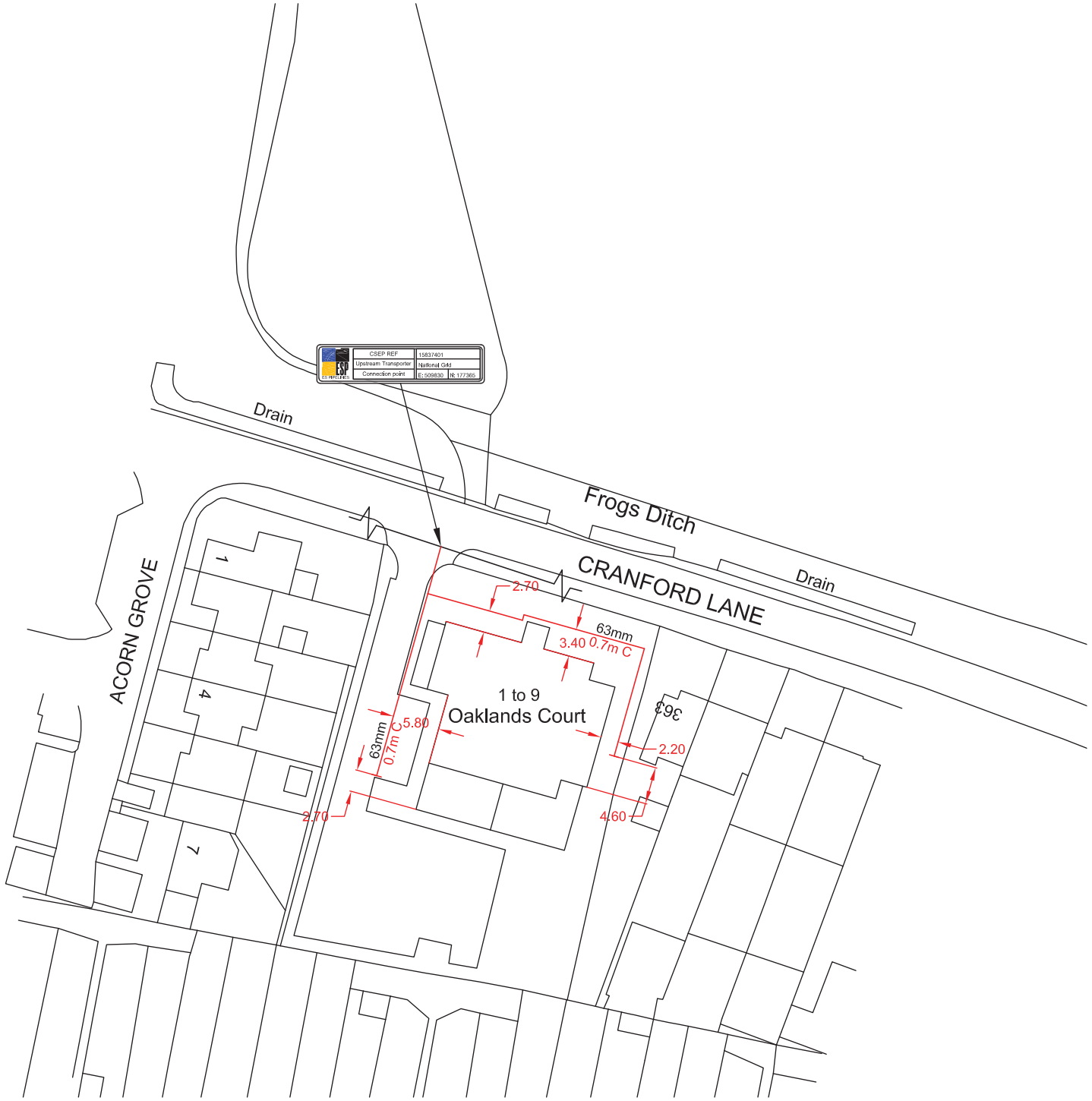
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SURREY
KT22 7AA
Tel: 01372 227560 FAX: 01372 377996

Drawn by	Scale:	Date created:
T. Spencer	1:250	November '15

DRAWING TITLE

Flats 1 - 9 Red House
360 Cranford Lane
Middlesex
UB3

Drawing No	ESN012771	REV:
Issue Number:	SHEET: 1 of 1	Printed:

Pipe Lengths (mm)

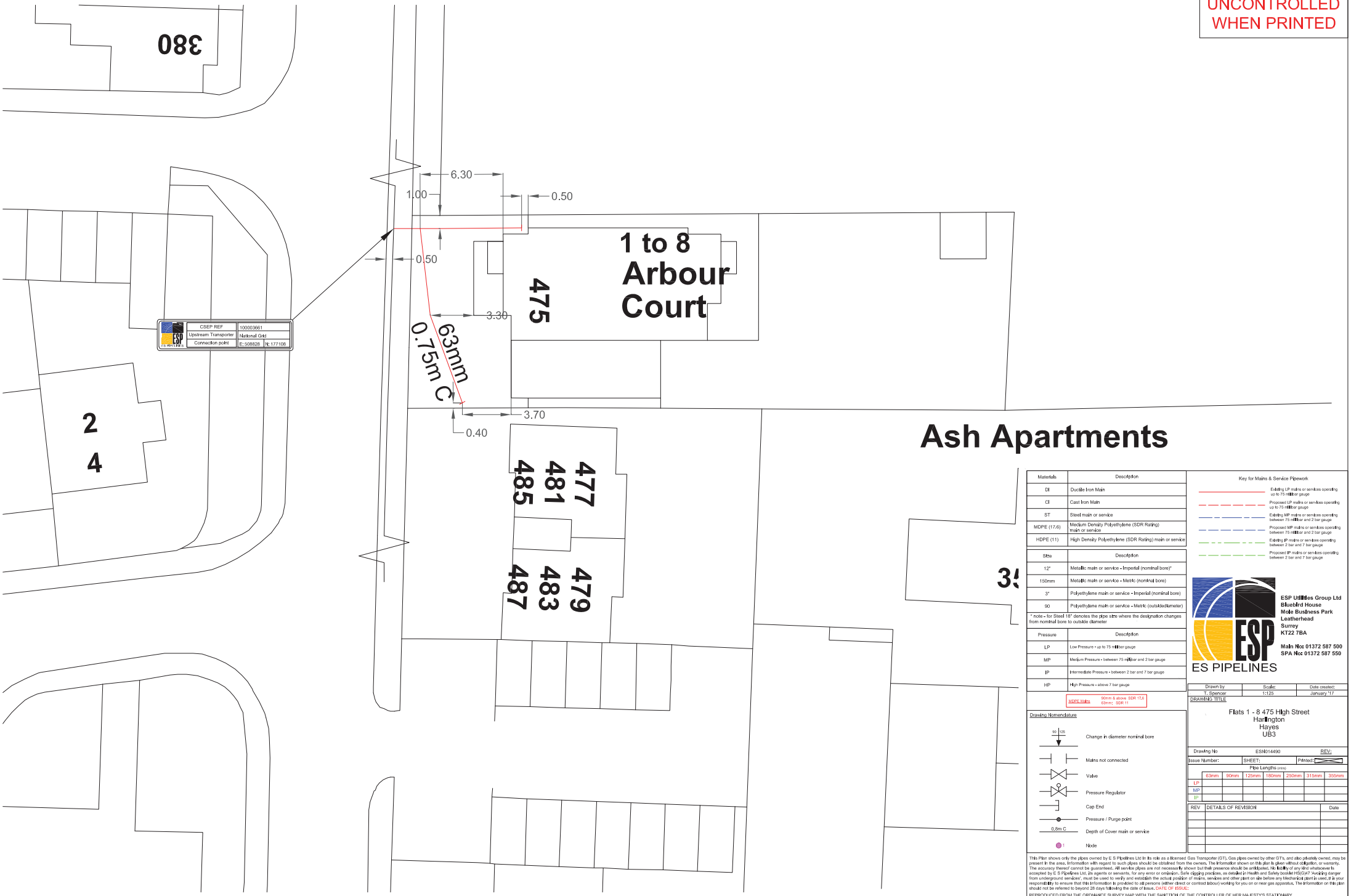
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HDPE (11)	High Density Polyethylene (SDR Rating) main or service

Size	Description
12"	Metallic main or service - Imperial (nominal bore)*
150mm	Metallic main or service - Metric (nominal bore)
3"	Polyethylene main or service - Imperial (nominal bore)
90	Polyethylene main or service - Metric (outsidediameter)

* note - for Steel 18" denotes the pipe size where the designation changes from nominal bore to outside diameter

Pressure	Description
LP	Low Pressure - up to 75 mlibar gauge
MP	Medium Pressure - between 75 mlibar and 2 bar gauge
IP	Intermediate Pressure - between 2 bar and 7 bar gauge
HP	High Pressure - above 7 bar gauge

MDPE Mains: 90mm & above SDR 17.6; 63mm: SDR 11

Drawing Nomenclature

- 90 | 125 — Change in diameter nominal bore
- Mains not connected
- Valve
- Pressure Regulator
- Cap End
- Pressure / Purge point
- 0.8m C — Depth of Cover main or service
- Node

Key for Mains & Service Pipework

- Existing LP mains or services operating up to 75 mlibar gauge
- Proposed LP mains or services operating up to 75 mlibar gauge
- Existing MP mains or services operating between 75 mlibar and 2 bar gauge
- Proposed MP mains or services operating between 75 mlibar and 2 bar gauge
- Existing IP mains or services operating between 2 bar and 7 bar gauge
- Proposed IP mains or services operating between 2 bar and 7 bar gauge

ESP Utilities Group Ltd
Bluebird House
Mole Business Park
Leatherhead
Surrey
KT22 7BA

Main No: 01372 587 500
SPA No: 01372 587 550

ES PIPELINES

Drawn by	Scale:	Date created:
T. Spencer	1:125	January '17

DRAWING TITLE

Flats 1 - 8 475 High Street
Harlington
Hayes
UB3

Drawing No	ESN014490	REV:
Issue Number:	SHEET:	Printed:

Pipe Lengths (mm)

	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP							
MP							
IP							

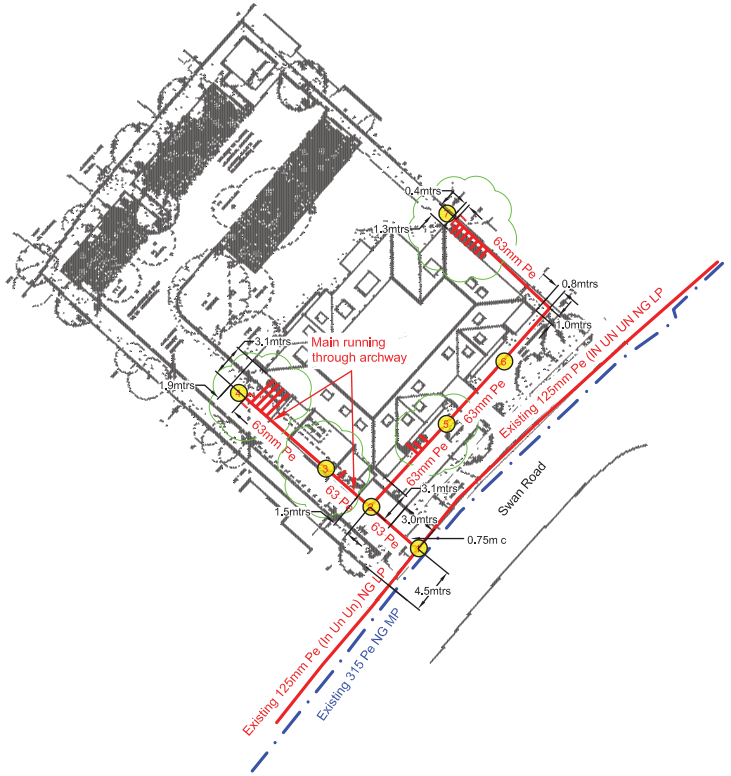
REV	DETAILS OF REVISION	Date

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CSEP REF	
Upstream Transporter	National Grid Gas
Connection point	E: 505994 N: 179790





All services laid at standard depth of cover (roads, verge & footpath) 0.45m, (private land) 0.375m. Unless otherwise stated.

All mains laid at standard depth of cover (fields) 1.1m, (roads & verge) 0.75m, (footpath) 0.6m Unless otherwise stated.

Materials	Description
DI	Ductile Iron Main
CI	Cast Iron Main
ST	Steel main or service
MDPE (17.6)	Medium Density Polyethylene (SDR Rating) main or service
HDPE (11)	High Density Polyethylene (SDR Rating) main or service

Size	Description
12"	Metallic main or service - Imperial (nominal bore)*
150mm	Metallic main or service - Metric (nominal bore)
3"	Polyethylene main or service - Imperial (nominal bore)
90	Polyethylene main or service - Metric (outsidediameter)

* note - for Steel 18" denotes the pipe size where the designation changes from nominal bore to outside diameter

Pressure	Description
LP	Low Pressure - up to 75 millibar gauge
MP	Medium Pressure - between 75 millibar and 2 bar gauge
IP	Intermediate Pressure - between 2 bar and 7 bar gauge
HP	High Pressure - above 7 bar gauge

MDPE Mains: 90mm & above SDR 17.6; 63mm SDR 11

Key for Mains & Service Pipework

- Existing LP mains or services operating up to 75 millibar gauge
- Proposed LP mains or services operating up to 75 millibar gauge
- Existing MP mains or services operating between 75 millibar and 2 bar gauge
- Proposed MP mains or services operating between 75 millibar and 2 bar gauge
- Existing IP mains or services operating between 2 bar and 7 bar gauge
- Proposed IP mains or services operating between 2 bar and 7 bar gauge

Drawing Nomenclature

- Change in diameter nominal bore (90 | 125)
- Mains not connected
- Valve
- Pressure Regulator
- Cap End
- Pressure / Purge point
- 0.8m C — Depth of Cover main or service
- 1 — Node

ES PIPELINES
ES Pipelines
HAZELDEAN
STATION ROAD
LEATHERHEAD
SURREY
KT22 7AA
Tel: 01372 227560 FAX: 01372 377996

Drawn by	Scale:	Date created:
WAC	1:250@A1	05/07/16

DRAWING TITLE

New Domestic Site @ 10-14 Swan Road
West Drayton
Middlesex
UB7 7JY

Drawing No	ESN017240	REV:	1
Issue Number:	SHEET: 1 of 1	Printed:	

Pipe Lengths (mtrs)

	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP	99						
MP							
IP							

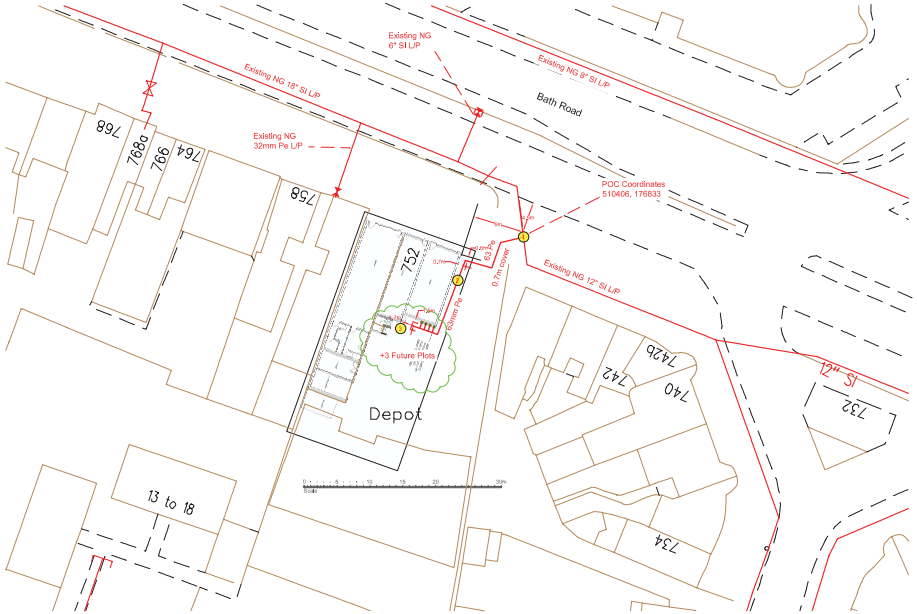
REV	DETAILS OF REVISION	Date
1	As Laid	05/07/16

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CSEP REF	500010089
Upstream Transporter	NG
Connection point	E: 510406 N: 176837

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Materials	Description
DI	Ductile Iron Main
CI	Cast Iron Main
ST	Steel main or service
MDPE (17.6)	Medium Density Polyethylene (SDR Rating) main or service
HDPE (11)	High Density Polyethylene (SDR Rating) main or service

Size	Description
12"	Metallic main or service - Imperial (nominal bore)*
150mm	Metallic main or service - Metric (nominal bore)
3"	Polyethylene main or service - Imperial (nominal bore)
90	Polyethylene main or service - Metric (outside diameter)

* note - for Steel 18" Services the pipe size where the designation changes from nominal bore to outside diameter

Pressure	Description
LP	Low Pressure - up to 75 mBar gauge
MP	Medium Pressure - between 75 mBar and 2 bar gauge
IP	Intermediate Pressure - between 2 bar and 7 bar gauge
HP	High Pressure - above 7 bar gauge

MDPE Mains 90mm S-class SDR 17.6 63mm SDR 11

Drawing Nomenclature

- Change in diameter nominal bore
- Mains not connected
- Valve
- Pressure Regulator
- Cap End
- Pressure / Purge point
- 0.8m C — Depth of Cover: main or service
- Node

Key for Mains & Service Pipework

- Existing LP mains or services operating up to 75 mBar gauge
- Proposed LP mains or services operating up to 75 mBar gauge
- Existing MP mains or services operating between 75 mBar and 2 bar gauge
- Proposed MP mains or services operating between 75 mBar and 2 bar gauge
- Existing IP mains or services operating between 2 bar and 7 bar gauge
- Proposed IP mains or services operating between 2 bar and 7 bar gauge

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LEATHERHEAD
SURREY
KT22 7AA
Tel: 01372 227560 FAX: 01372 377896

Drawn by	Scale	Date created
NR	1:500	

DRAWING TITLE

Flats 16-19
750-754 Bath Road
Hounslow, Middlesex
TW6 9TY

Drawing No	ESP017039	REV:
Issue Number:	SHEET:	Printed:

Pipe Lengths (m)

	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP							
MP							
IP							

REV	DETAILS OF REVISION	Date

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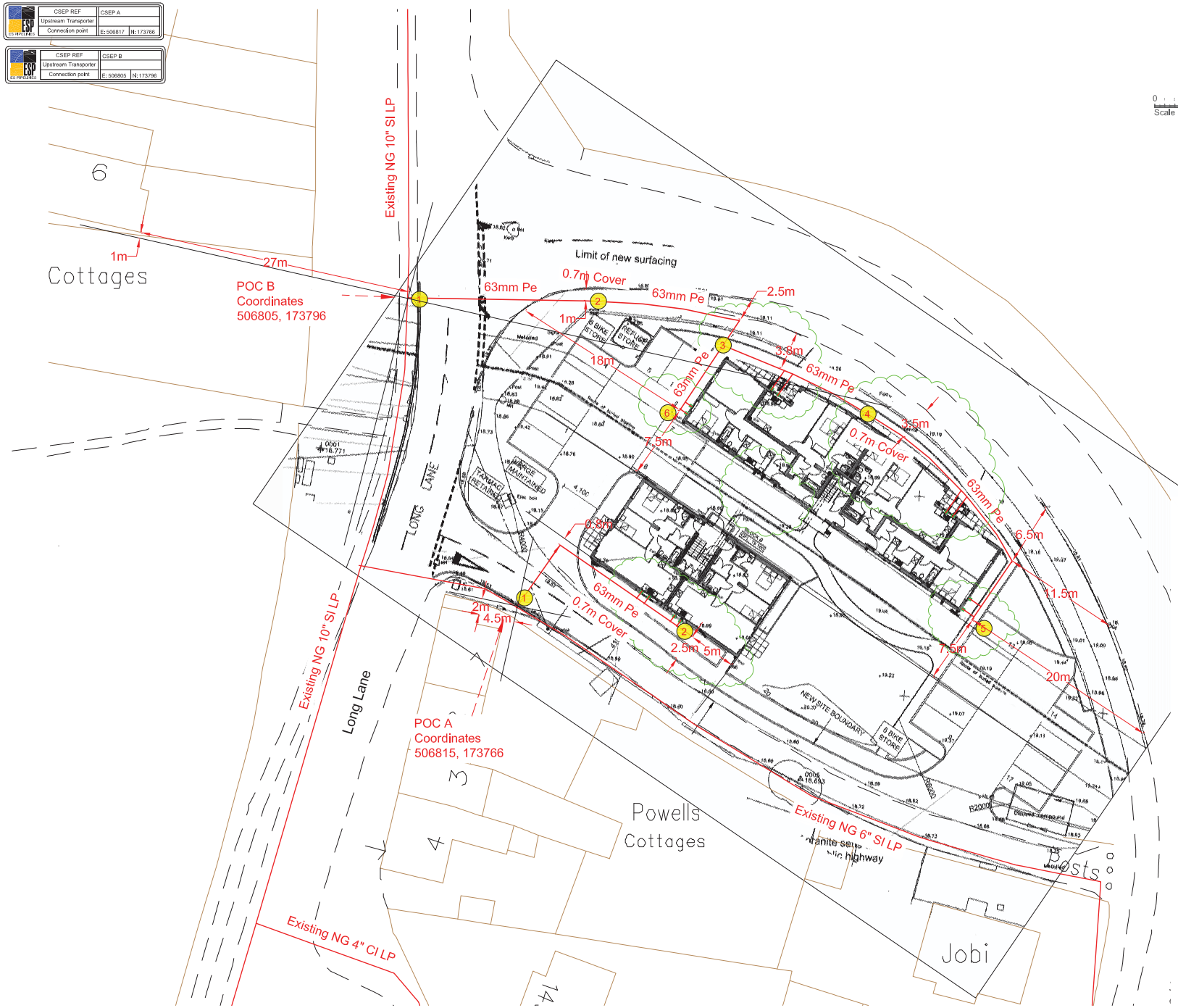
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Additional Layers

Once overlays are selected, all items will be displayed and clashing pipes will be shown with the layers falling over.

- Proposed Polyethylene (PE) Main or Service (LP Gas)
- Existing Cast Iron Main (LP Gas)
- Proposed MP Steel Main or Service (MP Gas)
- Existing Cast Iron Main (MP Gas)
- Proposed MP Steel Main or Service (MP Gas)
- Existing Cast Iron Main (IP Gas)
- Existing Gas Main
- Electricity Cable
- Electrical Cable

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Materials	Description
DI	Ductile Iron Main
CI	Cast Iron Main
ST	Steel main or service
MDPE (17.6)	Medium Density Polyethylene (SDR Rating) main or service
HDPE (11)	High Density Polyethylene (SDR Rating) main or service

Size	Description
12"	Metallic main or service - Imperial (nominal bore)*
150mm	Metallic main or service - Metric (nominal bore)
3"	Polyethylene main or service - Imperial (nominal bore)
90	Polyethylene main or service - Metric (outsidediameter)

* note - for Steel 18" denotes the pipe size where the designation changes from nominal bore to outside diameter

Pressure	Description
LP	Low Pressure - up to 75 mbar gauge
MP	Medium Pressure - between 75 mbar and 2 bar gauge
IP	Intermediate Pressure - between 2 bar and 7 bar gauge
HP	High Pressure - above 7 bar gauge

MDPE Mains: 90mm & above SDR 17.6; 63mm: SDR 11

Drawing Nomenclature

- Change in diameter nominal bore
- Mains not connected
- Valve
- Pressure Regulator
- Cap End
- Pressure / Purge point
- 0.8m C — Depth of Cover main or service
- Node

Key for Mains & Service Pipework

- Existing LP mains or services operating up to 75 mbar gauge
- Proposed LP mains or services operating up to 75 mbar gauge
- Existing MP mains or services operating between 75 mbar and 2 bar gauge
- Proposed MP mains or services operating between 75 mbar and 2 bar gauge
- Existing IP mains or services operating between 2 bar and 7 bar gauge
- Proposed IP mains or services operating between 2 bar and 7 bar gauge

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ES Pipelines
HAZELDEAN
STATION ROAD
LEATHERHEAD
SURREY
KT22 7AA
Tel: 01372 227560 FAX: 01372 377996

Drawn by	Scale:	Date created:
MR	1:250	21/11/16

DRAWING TITLE

Long Lane
Staines Upon Thames
Middlesex
TW19 7AL

Drawing No	ESN019292	REV:
Issue Number:	SHEET:	Printed:

Pipe Lengths (mm)

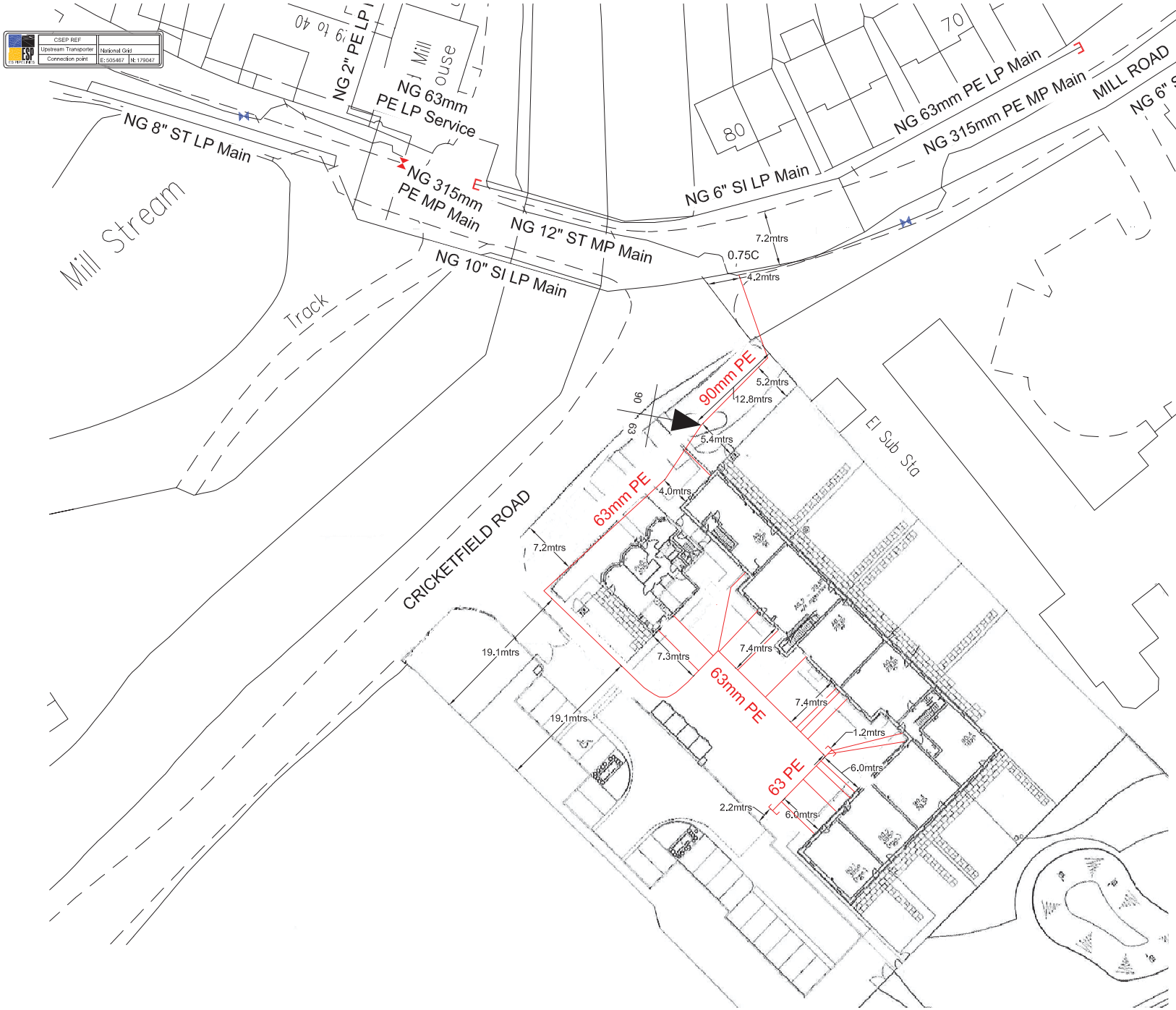
	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP							
MP							
IP							

REV	DETAILS OF REVISION	Date

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All mains laid at standard depth of cover 0.75m.

Materials	Description
DI	Ductile Iron Main
CI	Cast Iron Main
ST	Steel main or service
MDPE (17.6)	Medium Density Polyethylene (SDR Rating) main or service
HDPE (11)	High Density Polyethylene (SDR Rating) main or service

Size	Description
12"	Metallic main or service - Imperial (nominal bore)*
150mm	Metallic main or service - Metric (nominal bore)
3"	Polyethylene main or service - Imperial (nominal bore)
90	Polyethylene main or service - Metric (outsidediameter)

* note - for Steel 18" denotes the pipe size where the designation changes from nominal bore to outside diameter

Pressure	Description
LP	Low Pressure - up to 75 mBar gauge
MP	Medium Pressure - between 75 mBar and 2 bar gauge
IP	Intermediate Pressure - between 2 bar and 7 bar gauge
HP	High Pressure - above 7 bar gauge

MDPE Mains: 90mm & above SDR 17.6; 63mm: SDR 11

Key for Mains & Service Pipework

- Existing LP mains or services operating up to 75 mBar gauge
- Proposed LP mains or services operating up to 75 mBar gauge
- Existing MP mains or services operating between 75 mBar and 2 bar gauge
- Proposed MP mains or services operating between 75 mBar and 2 bar gauge
- Existing IP mains or services operating between 2 bar and 7 bar gauge
- Proposed IP mains or services operating between 2 bar and 7 bar gauge

Drawing Nomenclature

- 90 | 125 — Change in diameter nominal bore
- Mains not connected
- Valve
- Pressure Regulator
- Cap End
- Pressure / Purge point
- 0.8m C — Depth of Cover main or service
- Node

ESP Utilities
Bluebird House
Mole Bulsness Park
Leatherhead
SURREY
KT22 7BA
Tel: 01372 587500
ES PIPELINES

Drawn by	Scale:	Date created:
JMB	1:250	25/10/2017

DRAWING TITLE

Former Anglers Retreat PH
Cricketfield Road
West Drayton
Middlesex, UB7 7HG

Drawing No	ESN019472	REV:
Issue Number:	SHEET:	Printed:

Pipe Lengths (mtrs)

	63mm	90mm	125mm	180mm	250mm	315mm	355mm
LP	84	22					
MP							
IP							

REV	DETAILS OF REVISION	Date
1	Asbuilt	25/10/2017
2	Route of 63mm main and 2 service routes changed.	31-10-2017
3	Length of 63mm main laid altered.	21-11-2017

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Forestry Commission England

The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN

South East & London Area Office
Bucks Horn Oak
Farnham
GU10 4LS

Tel: 0300 0674420
southeast.fce@forestry.gsi.gov.uk

Area Director
Alison Field

19 June 2018

Your Ref: **TR020003 - Expansion of Heathrow Airport (Third Runway)**

Dear Sir/Madam,

Thank you for your consultation on the above scheme dated 22 May 2018, which was received by Forestry Commission via email on 22 May 2018.

The Forestry Commission's summary points are:

- Ancient Woodlands[1] and Veteran Trees are acknowledged as irreplaceable habitats and a part of our Historic Natural Heritage. It is not possible to fully compensate for the loss of any irreplaceable habitat such as Ancient Woodlands, therefore, the Forestry Commission recommends:
    - doing everything possible to avoid the loss or damage to ancient woodland and veteran trees;
    - where this is not possible, a significant package of ecologically significant compensation, which collectively delivers ecological enhancement to our ancient woodlands and veteran tree infrastructure, is secured in perpetuity.
- Encourage a thorough assessment of any loss of trees and woodlands within the project boundary.
- Compensation and the use of buffer zones to enhance the resilience of neighbouring ancient woodlands. These zones could include further tree planting or a mosaic of semi-natural habitats.
- Encourage you to design the associated infrastructure (green space, woodlands, public footpaths and cycleways) to build on the evolving network of green infrastructure to link the existing conurbations to adjacent countryside. When combined with an assessment of the impacts on health & wellbeing, this will aid the promotion for local residents to access the countryside. There is a range of options for green infrastructure delivery and the Forestry Commission would draw your attention to what has already been achieved in just 10 years at Jeskyns[2].
- Locally sourced timber is used in construction of appropriate structures including sound baffles.
- For the chosen option, the Forestry Commission would welcome the opportunity to provide advice at the appropriate time to ensure the most appropriate

[1] Ancient Woodlands includes Ancient Semi-Natural Woodland (ASNW) and Plantations (including conifers) on Ancient Woodland Sites (PAWS). See the Natural Environment section of the National Planning Practice Guidance (NPPG) under Biodiversity and ecosystems for more information.

[2] https://www.forestry.gov.uk/jeskyns

measures are adopted to minimise and / or compensate for the impacts on Ancient Woodlands.

The Forestry Commission is the Government Department that works with others to protect, improve and expand our nation's forests and woodland, increasing their value to society and the environment. As recognised in the *Making Sure Our Land Plays a Central Role in Capturing Carbon and Enhancing Natural Capital* section of the Government's Clean Growth Strategy (Updated April 2018)[3]:

> "During the 2020s we need to accelerate the rate of tree planting, working towards our 12 per cent tree cover aspiration by 2060. To do this will require investment by the private and charitable sectors, not just government. A number of our policy proposals will create the conditions for that investment to come forward. We will need new skills in forest design, a reliable supply of resilient planting stock, new opportunities for domestic timber, and a new generation of skilled people helping to enhance our towns, cities and countryside. Recently published natural capital accounts by the Office for National Statistics show that Britain's woodlands provide services of £2.3 billion per year to the economy in terms of recreation, carbon sequestration, timber and air pollutant removal."

The Forestry Commission is the Government experts on forestry & woodland and a statutory consultee (as defined by Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms And Procedures) Regulations 2009)[4] for major infrastructure (Nationally Significant Infrastructure Projects (NSIPS)) that are likely to affect the protection or expansion of forests and woodlands (Planning Act 2008)[5].

The Forestry Commission's response is based on information provided in the Heathrow Expansion Environmental Impact Assessment Scoping Report (the Report). This response highlights matters which should be resolved as part of the pre-application process. We believe that these issues should be addressed by the applicant as part of the examination and consenting process before a development consent order is granted.

6 Biodiversity

6.2 Policy and legislation

Table 6.1 Policy and legislation relevant to biodiversity assessment

This section of the Report has highlighted key policy and legislative documents to be used in the Environmental Impact Assessment (EIA) scoping report.

The Forestry Commission appreciates that, through assessing the relevant sections of the Revised Draft Airports National Policy Statement (ANPS), National Policy Statement for National Networks (NPSNN) report, the Planning Inspectorate has drawn attention to the importance of biological, and ecological conservation through avoiding environmental impacts in line with the principles set out in the government's planning guidance. Noting that since publishing this consultation document, the revised draft ANPS has now been withdrawn and replaced with the proposed ANPS published June 2018, all ANPS references below will be in relation to the June 2018 publication.

[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf
[4] http://www.legislation.gov.uk/uksi/2009/2264/contents/made
[5] http://www.legislation.gov.uk/uksi/2009/2264/schedule/1/made

In addition to the paragraphs already outlined in the report, the Forestry Commission would also highlight the *Irreplaceable habitats including ancient woodland and veteran trees* section of both the ANPS and the NPSNN:

ANPS Paragraph 5.103; and

NPSNN Paragraph 5.32:

> "Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss. Aged or veteran trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this."

Ancient woodlands and veteran trees are included in the list of protected species as highlighted on the Natural England website[6]. Ancient woodlands and veteran trees are irreplaceable and considered important for their wildlife, soils, recreation, cultural value, history and contribution to the landscape. Therefore, Ancient Woodlands and veteran trees must be included in all future habitat and species surveys in relation to this DCO. The Woodland Condition Assessment (WCA) guidance and forms[7] available on the Forestry Commission's website have been developed by the England Woodland Biodiversity Group. This WCA is suitable for your ecological consultants to use as it is broad in scope and suitable for use with all woodland types. If a BS5837:2012 Cascade chart[8] is used to carry out a tree quality assessment, ancient woodland sites would automatically be classified as A3 due to their natural heritage and ecological value.

In addition to the regulatory and policy framework outlined, the Forestry Commission considers the relevant documents and guidance notes outlined below as being pertinent to this DCO in relation to ancient woodland and veteran trees and should also be included in the report considerations.

The UK Forestry Standard (4th edition published August 2017).

Ancient woodland and veteran trees: protecting them from development (last updated January 2018)

National Planning Practice Guidance – Natural Environment Guidance (Published January 2016)

Government Forestry and Woodlands Policy Statement (Published January 2013)

Managing ancient and native woodland in England (last updated August 2016)

Keepers of Time – A Statement of Policy for England's Ancient and Native Woodland (published June 2005)

A Habitats Translocation Policy for Britain – (published July 2003)

Natural England Commissioned Report (NERC 132) Edition 3 (published November 2013)

[6] https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications
[7] https://www.forestry.gov.uk/england-hs2
[8] http://www.flac.uk.com/wp-content/uploads/2012/09/Table-1_flac.pdf

European Commission Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (published 2013)

BS 42020:2013 Biodiversity. Code of practice for planning and development (published August 2013)

Ancient and other veteran trees: further guidance on management (published February 2013)

Impacts of nearby development on ancient woodland – addendum (published December 2012)

BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (published April 2012)

Natural Environment White Paper "The Natural Choice" (published June 2011)

Impacts of nearby development on the ecology of ancient woodland (published October 2008)

Veteran Trees: A guide to good management – (published February 2000)

The Forestry Commission also considers the relevant paragraphs and guidance notes outlined in the appendices below with respect to biodiversity in planning decisions as being pertinent to any DCO and should be included in a report prepared for considerations.

The Forestry Commission would welcome the opportunity to provide advice at the appropriate time to ensure the most appropriate measures are adopted to minimise and / or compensate for the impacts on Ancient Woodlands and Habitats of Principle Importance.

6.6 Baseline condition

The Forestry Commission welcomes the inclusion of woodland habitats recognised as a habitat of principal importance under Section 41 of the NERC Act 2006 to be included in all survey work and study reports.

As highlighted in the Natural Environment section of the National Planning Practice Guidance (NPPG) under Biodiversity and ecosystems[9]:

> "Both Ancient Semi-Natural Woodland (ASNW) as well as Plantations on Ancient Woodland Sites (PAWS) are ancient woodland. Both types should be treated equally in terms of the protection afforded to ancient woodland in the National Planning Policy Framework."

All ASNW and PAWS areas should be included in the study area to:

- ensure these areas are treated equally in terms of protection afforded to ancient woodlands; and,
- to secure the future of one of the most diverse ecosystems in perpetuity.

As outlined in the NPPG, this will ensure these irreplaceable habitats continue to provide local ecological networks important for securing and enhancing ecosystem services including biodiversity, and for holding nature conservation value of the area.

In line with the NPPG, the Forestry Commission recommends that the baseline condition assessment clearly defines the location, status and number of hectares of

[9] https://www.gov.uk/guidance/natural-environment

ancient woodland sites, to include ASNW and PAWS sites, veteran trees, alongside woodland habitats recognised as a habitat of principal importance under Section 41 of the NERC Act 2006. By including this data in all survey work and study reports, and using the Forestry Commission's Woodland Condition Assessment methodology, a thorough assessment of these differing habitats will acknowledge the impacts on any potential losses of irreplaceable and important habitats and veteran trees. This work will support decisions required for meeting the objectives outlined in *Chapter 11 Conserving and enhancing the natural environment* of the National Planning Policy Framework (NPPF) as outlined in Table 6.1 is met.

Due to the nature of ancient woodlands and veteran trees being an irreplaceable habitat, the Forestry Commission recommends that every effort is afforded to avoid this scheme affecting ancient woodlands or veteran trees. The Planning Inspectorate and developer should start by looking for ways to avoid the development affecting ancient woodland or veteran trees e.g. where possible, redesigning the scheme in line with the recommendations outlined in BS 5837:2012[10].

It is not possible to fully compensate for the loss or damage to ancient woodlands, thus compromising the government's aim to achieve environmental net gain as set out in their strategy document: '*A Green Future: Our 25 Year Plan to Improve the Environment* (the 25 year plan)' (HM Government, 2018)[11].

6.9 Proposed approach to the assessment

Table 6.12 Importance of habitats/species populations a the DCO Project level

The Forestry Commission welcomes the recognition of Ancient Woodlands as having National Importance alongside nationally designated sites including Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR) as outlined in Table 6.12. However, not all ancient woodlands are within a designated site such as a SSSI or NNR. Therefore, these woodland habitats, recognised as having National Importance, must be clearly defined. To facilitate this, the Forestry Commission recommends that Table 6.6 is renamed to: *Table 6.6 Sites of Special Scientific Interest + Ancient Woodlands / irreplaceable habitats within 2km*.

6.10 Approach to mitigation and compensation

As an irreplaceable habitat, it is not possible to fully compensate against the loss of ancient woodland and veteran trees; therefore, compensation would be required. For that reason, the Forestry Commission recommends that every effort is afforded to avoid this scheme affecting ancient woodlands or veteran trees. The Planning Inspectorate and developer should start by looking for ways to avoid the development affecting ancient woodland or veteran trees e.g. by redesigning the scheme in line with the recommendations outlined in the guidance: *Ancient woodland and veteran trees: protecting them from development*[12] page on GOV.UK and in BS 5837:2012[13].

Due to the fact that it is not possible to fully compensate for the loss or damage to these irreplaceable habitats, this will compromise the UK government's ambition "not just to preserve, but to enhance our natural capital – the air, water, soil and

[10] https://shop.bsigroup.com/ProductDetail/?pid=000000000030213642
[11] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf
[12] https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences#assess-the-impacts
[13] https://shop.bsigroup.com/ProductDetail/?pid=000000000030213642

ecosystems that support all forms of life" as stated in their Industrial Strategy White Paper (2017)[14]. This White Paper has also acknowledged advice from the Natural Capital Committee:

> "The Natural Capital Committee has advised that carefully planned and targeted investments in natural capital – such as woodland planting, peatland restoration and wetland creation – can deliver significant economic growth, and generate returns of up to nine times the costs."
> (Page 148)

If the final Scheme Option results in the loss of Ancient Woodland, the Forestry Commission would refer the developers to the Joint Nature Conservation Committee (JNCC) Habitat Translocation Policy document[15]:

> "Available information shows that it is not possible to move species assemblages without substantial changes taking place in the structure of the habitat and its species composition, thus rendering the translocation unsuccessful."

Through a literature review of case studies to address environmental impacts of linear transport infrastructure on protected species and habitats, Edition 3 of the Natural England Commissioned Report (NERC 132)[16] reiterates the message that "translocation of ancient woodland soils and coppiced stools does not imply that these methods mitigate the loss of ancient woodland." and that "the measure should not be interpreted as a successful means of mitigating the fragmentation of ancient woodland; a resource which cannot be re-created through tree planting or habitat translocation due to its complex structure and wider-ranging biodiversity."

As highlighted in Appendix 6.4, paragraph 3.2.5 of the Report:

> "Defra guidance also makes clear that compensation for proposed losses to irreplaceable habitats (e.g. ancient woodland) or nationally designated sites (e.g. Sites of Special Scientific Interest) must be considered separately from the biodiversity offset. This principle will be followed by the Project."

Where a loss is deemed unavoidable, the Forestry Commission would welcome the opportunity to provide advice at the appropriate time to ensure the most appropriate measures are adopted to minimise and / or compensate for the impacts on Ancient Woodlands. With the government's new approach to "put the environment at the heart of planning and development to create better places for people to live and work. … We will seek to embed a 'net environmental gain' principle for development to deliver environmental improvements locally and nationally" as outlined in the new 25 Year Environment Plan[17], it is important that this, and any new scheme, could be an exemplar for achieving a net gain in biodiversity.

As highlighted in the *Irreplaceable habitats including ancient woodland and veteran trees* section (Paragraph 5.103) of the ANPS and in line with the NPPG under Biodiversity and ecosystems, once an irreplaceable habitat is lost, it cannot be recreated. Therefore, putting a value on the loss of ancient woodland soils is challenging. To ensure an informed decision can be made, the Forestry Commission recommends that all surveys clearly define the ancient woodland sites, to include

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[14] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf

[15] http://jncc.defra.gov.uk/pdf/habitats_policy.pdf

[16] http://publications.naturalengland.org.uk/publication/6184646404472832

[17] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

ASNW and PAWS sites and the location of Veteran Trees, are identified to ensure that a thorough assessment will acknowledge the impacts on any potential losses of irreplaceable habitats.

As part of the valuation process, the cost of compensation for loss of irreplaceable and principally important habitats must be included in the test of public benefit to demonstrate accurately that the substantial harm or loss of significant habitats is necessary in order to deliver substantial public benefits that outweigh that loss or harm.

In assessing these schemes, if the Planning Inspectorate decides to grant planning permission in line with the ANPS, NPSNN, NPPF and NPPG, it should seek appropriate compensation from the developer. As the government experts on forestry & woodland and a statutory consultee (as defined by Schedule 1 of The Infrastructure Planning (Applications: Prescribed Forms And Procedures) Regulations 2009) for major infrastructure (Nationally Significant Infrastructure Projects (NSIPS)), the Forestry Commission would welcome the opportunity to discuss with the developer options for addressing issues with regard to this scheme and to ensure appropriate ecological monitoring is established for a significant period of time – at least 30 years, preferably up to 50 years.

The Planning Inspectorate should use planning conditions or obligations to secure compensation measures and subsequent ecological monitoring. The joint Standing Advice[18], prepared by Forestry Commission and Natural England, provides advice and the assessment tools to be used when assessing the impacts of all options for the scheme.

Where the impacts cannot be fully avoided, a package of compensatory habitat provision and management of existing ancient woodlands will be required. It would appear appropriate for this to be delivered in conjunction with other projects. The Forestry Commission can provide advice on impacts to ancient woodland outside of SSSI sites. For ancient woodlands within SSSI sites, we would provide advice alongside colleagues from Natural England as the scheme progresses towards the submission stage.

Chapter 7: Carbon and other greenhouse gases

This chapter of the report focusses on carbon dioxide (CO_2) and Greenhouse Gas (GHG) emissions of the airport in alignment with the annual sustainability performance report and Airports Commission report. The CO_2 reporting is for Department of Transport and Committee on Climate Change purposes. The GHG assessment, which focuses on direct and indirect emissions, will be for the purposes of the DCO project.

As highlighted in the 25 Year Environment Plan[19]:

> "The value of natural capital is routinely understated. If we look at England's woods and forests, for example, as a national asset, using a natural capital approach, the value of the services they deliver is an estimated £2.3bn. Of this sizeable sum, according to a recent study, only a small proportion – 10% – is in timber values. The rest derives from other benefits provided to society, such as human recreation and carbon sequestration – the process by which trees lock-up and store carbon from the atmosphere."

[18] https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences
[19] https://www.gov.uk/government/publications/25-year-environment-plan

Therefore, the Forestry Commission would recommend that as part of the assessment, any loss of trees or woodlands as part of this DCO are included in the GHG calculations. This will help to inform the compensation package required to ensure overall no net gain in GHG emissions and secure the UKs commitment to the COP21 Paris Agreement of limiting temperature increases to below 2 degrees Celsius, and be in alignment with the UKs Climate Change Act target of an 80% reduction by 2050.

To meet the requirements, the Forestry Commission would like to reiterate the importance of all woodlands in making our rural and urban landscapes more resilient to the effects of climate change and contribution to wider climate change adaptation. Consideration for how sustainable woodland creation and management of England's Woodlands can be secured and the use of timber as a construction material is utilised within this scheme will secure the role that woodlands have in reducing greenhouse emissions and carbon sequestration.

The Forestry Commission suggests that the Environmental Statement for Heathrow Airport Expansion includes an assessment of the:

- proposed loss of carbon stored in existing woodlands, trees, soils, peat etc. that will be negatively impacted from the airport expansion
- carbon cost of construction (reduced by the use of timber where appropriate)
- carbon cost of running the airport in perpetuity (excluding aircraft)
    - carbon lean power/heat using locally sources fuelwood as per Terminal 2&5 Biomass CHP power station (calculations to include the carbon related environmental benefits of encouraging markets for locally sourced timber and the biodiversity benefits of bringing local woods into management)
    - carbon cost of commuting vs the promotion of green corridors

As part of this assessment, the Forestry Commission can provide advice on appropriate tree selection in the design and mitigation plans to ensure the contribution this scheme can deliver to achieve long-term resilience to climate change.

Chapter 9 Community

Chapter 12 Health

The Forestry Commission welcomes the inclusion of assessing recreational routes for walking and cycling, and the likely impacts as an outcome of this DCO in Chapter 9. Chapter 12 focusses on the World Health Organisation definition of health and wellbeing, then goes onto highlight the factors that influence health and wellbeing both at the local and wider society level.

The Forestry Commission is encouraged by your interest in working with partners to develop an integrated network of green infrastructure to include wildlife and access corridors enhancing local wildlife habitats, providing commuter routes as well as recreational access to local residents. Therefore, we would promote the inclusion of measures to build the evolving network of green infrastructure to link the existing conurbations to adjacent countryside. Assessment of the impact of such positive inclusions should be part of the scoping of wider carbon balance and community health & wellbeing. This will aid the promotion of and help encourage people to access the countryside by the local community for quiet enjoyment – important factors for health and wellbeing, both physical and mental health. There are a range of options for green infrastructure and the Forestry Commission would bring attention to what has been

achieved at Jeskyns[20]. Linking Jeskyns to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of landscape scale green infrastructure.

Conclusion:

From the information supplied in the EIA Scoping Report, we advise that in respect of loss of any woodland, particularly the loss of irreplaceable and principally important habitats and ecosystems must be included in the test of public benefit to demonstrate accurately that "In considering the impact of a proposed development on any heritage assets, the Secretary of State will take into account the particular nature of the significance of the heritage asset and the value that they hold for this and future generations. This understanding should be used to avoid or minimise conflict between their conservation and any aspect of the proposal" as outlined in bullet point 5.198 of the ANPS.

For the loss of any woodland, the Forestry Commission would ask:

1. To explore with you how this loss could be further reduced and how direct and indirect impacts on ancient woodlands can be minimised;
2. It is made clear how creation of new woodland will be targeted to compensate for the loss of all trees and woodlands;
3. That the applicant engages with the Forestry Commission at the earliest opportunity so that our expertise can be used to support the development of options and design of the chosen way forwards.

Outlined above are the key areas of information would be required in order to allow the applicant to proceed with delivery of this scheme with least detrimental impact to the surrounding environment, and the Examining Authority properly to undertake its task or where further work is required to determine the effects of the project and/or to flesh out compensation proposals to provide a sufficient degree of confidence as to their efficacy.

Forestry Commission's headline points are that on the basis of the information submitted, if approved, the project must be subject to all necessary and appropriate requirements which ensure that unacceptable environmental impacts either do not occur or are sufficiently compensated, as proposed in the proposed Code of Construction Practice.

If you have any further questions, then please do not hesitate to consult the Forestry Commission.

Yours sincerely,

Caroline Parker
Local Partnership Advisor
Forestry Commission - South East & London
Bucks Horn Oak
Farnham
Surrey
GU10 4LS

[20] https://www.forestry.gov.uk/jeskyns

Appendix 1: Airports National Policy Statement 2018

Section 105 of the Planning Act 2008 sets out what the Secretary of State must have regard to in making his or her decision where a relevant NPS is not designated. This includes any matter that the Secretary of State thinks is important and relevant to the Secretary of State's decision. This could include a draft NPS, if one exists.

The revised draft Airports National Policy Statement (ANPS) was withdrawn on 5th June 2018 and replaced with the proposed ANPS in June 2018.

The proposed Airports National Policy Statement sets out:

- the need for additional airport capacity in the south-east of England
- why government believes that need is best met by a north-west runway at Heathrow Airport
- the specific requirements that the applicant for a new north-west runway will need to meet to gain development consent

This Airports National Policy Statement updates the revised draft Airports National Policy Statement, published for the second consultation in October 2017.

The revised draft Airports National Policy Statement was subject to public consultation and Parliamentary scrutiny. All sections below are taken directly from the June 2018 proposed ANPS.

Chapter 1. Introduction

Background

1.5 In its Final Report in July 2015, the Airports Commission unanimously concluded that the proposal for a Northwest Runway at Heathrow Airport, combined with a significant package of measures to address its environmental and community impacts, presented the strongest case and offered the greatest strategic and economic benefits.

Purpose and scope of the Airports NPS

1.18 Under section 104 of the Planning Act 2008, the Secretary of State must decide any application in accordance with any relevant NPS unless he or she is satisfied that to do so would:

- *Lead to the UK being in breach of its international obligations;*
- *Be unlawful;*
- *Lead to the Secretary of State being in breach of any duty imposed by or under any legislation;*
- *Result in adverse impacts of the development outweighing its benefits; or*
- *Be contrary to legislation about how the decisions are to be taken.*

Appraisal of Sustainability

1.27 An Appraisal of Sustainability is required by the Planning Act 2008 in relation to any NPS. An Appraisal of Sustainability, which describes the analysis of reasonable alternatives to the preferred scheme, has been carried out to inform the Airports NPS. The Appraisal of Sustainability informs the development of the Airports NPS by assessing the potential economic, social and environmental impacts of options to increase airport capacity.

1.29 The overall conclusions of the Appraisal of Sustainability show that (provided any scheme remains within the parameters and boundaries in this policy), whilst there will be inevitable harm caused by a new Northwest Runway at Heathrow Airport in relation to some topics, the need for such a scheme, the obligation to mitigate such harm as far as possible, and the benefits that such a scheme will deliver, outweigh such harm. However, this is subject to the assessment of the effects of the preferred scheme, identification of suitable mitigation, and measures to secure and deliver the relevant mitigation.

1.30 The preferred scheme has been subject to further refinement by Heathrow Airport since the conclusion of the work of the Airports Commission. These refinements were not captured within the Airports Commission's appraisals and are not expected to significantly alter the key appraisal findings. The Government expects any applicant to carry out a further and more detailed study, and to secure appropriate mitigation measures, ahead of seeking development consent.

Relationship between the Airports NPS and the Aviation Policy Framework

1.39 On 21 July 2017, the Government issued a call for evidence on a new Aviation Strategy. Having analysed the responses, the Government has confirmed that it is supportive of airports beyond Heathrow making best use of their existing runways. However, we recognise that the development of airports can have positive and negative impacts, including on noise levels. We consider that any proposals should be judged on their individual merits by the relevant planning authority, taking careful account of all relevant considerations, particularly economic and environmental impacts.

Chapter 3. The Government's preferred scheme: Heathrow Northwest Runway

Local environmental, health and community impacts

3.49 Decisions on airport capacity must rightly balance local, environmental and social considerations against the national and local benefits stemming from expansion. As set out above, in terms of economic and strategic benefits, expansion via the Heathrow Northwest Runway scheme best meets the need for additional capacity in the South East of England. However, set against these positive impacts, airport expansion can also have negative impacts. For example, all three schemes will have significant impacts on the environment and local communities.

3.53 The Appraisal of Sustainability identifies that, in addition to changes due to local noise and air quality impacts, communities may be affected by airport expansion through loss of, and/or additional demand for housing, community facilities or services, including recreational facilities. In addition, there will be effects on parks, open spaces and the historic environment, which will affect the quality of life of local communities which benefit from access to these facilities and features. These effects will be of a higher magnitude for the two Heathrow expansion schemes and a lower magnitude for Gatwick Second Runway. Overall, each of the three schemes is expected to have negative impacts on local communities, with more severe impacts expected from the Heathrow schemes. Impacts of all three schemes will not be felt equally across social groups. Equality impacts are set out in chapter four.

3.54 The Heathrow Northwest Runway scheme will be accompanied by a package of measures to mitigate the impact of airport expansion on the environment and

affected communities. The Government agrees with the Airports Commission's conclusion that "to make expansion possible…a comprehensive package of accompanying measures [should be recommended to] make the airport's expansion more acceptable to its local community, and to Londoners generally". This is expected to include a highly valued scheduled night flight ban of six and a half hours between 11pm and 7am (with the exact start and finish times to be determined following consultation), and the offer of a predictable, though reduced, period of respite for local communities.

Conclusion

3.75 A number of mitigation measures will need to be applied to reduce the impacts of the Heathrow Northwest Runway scheme felt by the local community and the environment. Airport expansion is also expected to be accompanied by an extensive and appropriate compensation package for affected parties. With these safeguards in place, the Government considers that the Heathrow Northwest Runway scheme delivers the greatest strategic and economic benefits, and is therefore the most effective and appropriate way of meeting the needs case.

Chapter 4. Assessment principles

General principles of assessment

4.4 In considering any proposed development, and in particular when weighing its adverse impacts against its benefits, the Examining Authority and the Secretary of State will take into account:

- *Its potential benefits, including the facilitation of economic development (including job creation) and environmental improvement, and any long term or wider benefits; and*
- *Its potential adverse impacts (including any longer term and cumulative adverse impacts) as well as any measures to avoid, reduce or compensate for any adverse impacts.*

4.5 In this context, environmental, safety, social and economic benefits and adverse impacts should be considered at national, regional and local levels. These may be identified in the Airports NPS, or elsewhere. The Secretary of State will also have regard to the manner in which such benefits are secured, and the level of confidence in their delivery.

4.7 Where the applicant's proposals in relation to surface access meet the thresholds to qualify as nationally significant infrastructure projects under the Planning Act 2008, or is associated development under section 115 of the Planning Act 2008, the Secretary of State will consider those aspects by reference to both the National Networks NPS and the Airports NPS, as appropriate. To the extent that discrete aspects of the surface access proposals do not qualify as nationally significant and cannot be included in a development consent application as associated development (for example), the applicant will be expected to pursue or secure necessary consent(s) through the most appropriate alternative consenting regime. This might include, for example, the Town and Country Planning Act 1990, the Highways Act 1980, or the Transport and Works Act 1992, promoted by a third party if need be.

Environmental Impact Assessment

4.12 All proposals for projects that are subject to the European Union's Environmental Impact Assessment Directive, and are likely to have significant effects on the environment, must be accompanied by an environmental statement, describing the aspects of the environment likely to be significantly affected by the project. The Directive specifically requires an Environmental Impact Assessment to identify, describe and assess effects on human beings, fauna and flora, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them. Schedule 4 to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 sets out the information that should be included in the environmental statement. This includes a description of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative, short-, medium- and long-term, permanent and temporary, positive and negative effects of the project, and also the measures envisaged for avoiding or mitigating significant adverse effects.

4.13 When examining a proposal to which the Airports NPS applies, the Examining Authority should ensure that likely significant effects at all stages of the project have been adequately assessed. The effects of any changes in operations, including the number of air traffic movements, during the construction and operational phases must be properly assessed and appropriate mitigation secured for any significant effects. Any requests for environmental information not included in the original environmental statement should be proportionate and focus only on likely significant effects. In the Airports NPS, the terms 'effects', 'impacts' or 'benefits' should accordingly be understood to mean likely significant effects, impacts or benefits.

4.14 When considering significant cumulative effects, any environmental statement should provide information on how the effects of an applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been granted, as well as those already in existence if they are not part of the baseline).

4.15 The Examining Authority should consider how significant cumulative effects, and the interrelationship between effects, might as a whole affect the environment, even though they may be acceptable when considered on an individual basis or with mitigation measures in place.

Habitats Regulations Assessment

4.22 Where a development may negatively affect any priority natural habitat type or priority species, any imperative reasons of overriding public interest case would need to be established solely on one or more of the grounds relating to human health, public safety or beneficial consequences of primary importance to the environment. The competent authority may only rely on other (i.e. social or economic) imperative reasons of overriding public interest if it has first obtained an opinion from the European Commission.

Assessing alternatives

4.28 The applicant should comply with all legal obligations and policy set out in the Airports NPS on the assessment of alternatives. In particular:

- *The Environmental Impact Assessment Directive requires projects with significant environmental effects to include a description of the reasonable alternatives studied by the applicant which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the significant effects of the project on the environmental effects;*
- *There may also be other specific legal obligations requiring the consideration of alternatives, for example, under the Habitats and Water Framework Directives; and*
- *There may be policies in the Airports NPS requiring consideration of alternatives, for example the flood risk sequential test.*

Criteria for 'good design' for airports infrastructure

4.31 A good design should meet the principal objectives of the scheme by eliminating or substantially mitigating the adverse impacts of the development, for example by improving operational conditions. It should also mitigate any existing adverse impacts wherever possible, for example in relation to safety or the environment. A good design will also be one that sustains the improvements to operational efficiency for as many years as is practicable, taking into account capital cost, economics and environmental impacts.

4.33 The scheme should take into account, as far as possible, both functionality, including fitness for purpose and sustainability, and aesthetics, including the scheme's contribution to the quality of the area in which it would be located. The applicant will want to consider the role of technology in delivering new airports projects. Professional, independent advice on the design aspects of a proposal should be undertaken to ensure good design principles are embedded into infrastructure proposals.

4.34 There may be opportunities for the applicant to demonstrate good design in terms of siting and design measures relative to existing landscape and historical character and function, landscape permeability, landform, and vegetation.

Climate change adaptation

4.42 This section sets out how the Airports NPS puts Government policy on climate change adaptation into practice, and in particular how the applicant and the Secretary of State will take into account the effects of climate change when developing and considering airports infrastructure applications. Climate change mitigation is essential to minimise the most dangerous impacts of climate change, as previous global greenhouse gas emissions will already mean some degree of continued climate change for at least the next 30 years. Climate change is likely to mean that the UK will experience on average hotter, drier summers and warmer, wetter winters. There is potentially an increased risk of flooding, drought, heatwaves, intense rainfall events and other extreme events such as storms and wildfires, as well as rising sea levels.

4.43 Adaptation is therefore necessary to deal with the potential impacts of these changes that are already happening. New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the provision of green infrastructure.

4.45 New airports infrastructure will typically be a long-term investment which will need to remain operational over many decades, in the face of a changing climate. Consequently, the applicant must consider the impacts of climate change when planning design, build and operation. Any accompanying environmental statement should set out how the proposal will take account of the projected impacts of climate change.

Chapter 5. Assessment of impacts

Decision making

5.21 The applicant's proposals will give rise to impacts on the existing and surrounding transport infrastructure. The Secretary of State will consider whether the applicant has taken all reasonable steps to mitigate these impacts during both the development and construction phase and the operational phase. Where the proposed mitigation measures are insufficient to effectively offset or reduce the impact on the transport network, arising from expansion, of additional passengers, freight operators and airport workers, the Secretary of State will impose requirements on the applicant to accept requirements and / or obligations to fund infrastructure or implement other measures to mitigate the adverse impacts, including air quality.

Carbon emissions

5.69 The Planning Act 2008 requires that a national policy statement must give reasons for the policy set out in the statement and an explanation of how the policy set out in the statement takes account of Government policy relating to the mitigation of, and adaptation to, climate change. The Government has a number of international and domestic obligations to limit carbon emissions. Emissions from both the construction and operational phases of the project will be relevant to meeting these obligations.

5.76 Pursuant to the terms of the Environmental Impact Assessment Regulations, the applicant should undertake an assessment of the project as part of the environmental statement, to include an assessment of any likely significant climate factors. The applicant should provide evidence of the carbon impact of the project (including embodied carbon), both from construction and operation, such that it can be assessed against the Government's carbon obligations, including but not limited to carbon budgets. The applicant should quantify the greenhouse gas impacts before and after mitigation to show the impacts of the proposed mitigation. This will require emissions to be split into traded sector and non-traded sector emissions, and for a distinction to be made between international and domestic aviation emissions.

5.80 Mitigation measures at the construction stage should also be provided and draw on best practice from other major construction schemes, including during the procurement of contractors. Specific measures could include but are not limited to:

- *Development of a construction traffic management plan (which may include the possible use of rail and consolidation sites);*
- *Transport of materials to site by alternative modes to road (for example by rail or water);*
- *Increased efficiency in use of construction plant;*

- *Use of energy efficient site accommodation;*
- *Reduction of waste, and the transport of waste;*
- *Construction site connection to grid electricity to avoid use of mobile generation;*
- *Selection of construction material to utilise low carbon options; and*
- *Selection of construction material to minimise distance of transport.*

5.81 The implementation of mitigation measures may require working with partners to support their delivery.

5.83 Evidence of appropriate mitigation measures (incorporating engineering plans on configuration and layout, and use of materials) in both design and construction should be presented as part of any application for development consent. The Secretary of State will consider the effectiveness of such mitigation measures in order to ensure that, in relation to design and construction, the carbon footprint is not unnecessarily high. The Secretary of State's view of the adequacy of the mitigation measures relating to design, construction and operational phases will be a material factor in the decision making process.

Biodiversity and ecological conservation

5.84 Biodiversity is the variety of plant and animal life in the world or in a particular habitat, and encompasses all species of plants and animals and the complex ecosystems of which they are a part. Government policy for the natural environment, including on biodiversity, is set out in the *Natural Environment White Paper*. The biodiversity section in the *Natural Environment White Paper* sets out a vision of moving progressively from new biodiversity loss to net gain, by supporting healthy, well-functioning ecosystems and establishing more coherent ecological networks that are more resilient to current and future pressures. It is also a requirement of the Water Framework Directive to protect and enhance biodiversity associated with the water environment. Geological conservation relates to the sites that are designated for their geology and / or geomorphological importance.

5.85 The Government's biodiversity strategy is set out in *Biodiversity 2020: A Strategy for England's wildlife and ecosystem services*. Its aim is to halt overall biodiversity loss, support healthy, well-functioning ecosystems, and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people. The contribution that the planning system should make to enhancing the local and natural environment, including establishing coherent ecological networks, is set out in the National Planning Policy Framework, to which the applicant should also refer.

5.86 The National Planning Policy Framework states that pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life. This includes moving from a net loss of biodiversity to achieving net gains for nature.

5.87 The wide range of legislative provisions at the international and national level that can impact on planning decisions affecting biodiversity and ecological conservation is set out in the Planning Practice Guidance on biodiversity and ecosystems. This includes a description of the potential impacts on internationally, nationally and

locally protected sites which may arise through development, and should therefore be considered through further assessment.

5.89 The applicant should ensure that the environmental statement submitted with its application for development consent clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological importance, protected species, and habitats and other species identified as being of principal importance for the conservation of biodiversity.

5.90 The Environmental Impact Assessment should reflect the principles of *Biodiversity 2020* and identify how the effects on the natural environment will be influenced by climate change, and how ecological networks and their physical and biological process will be maintained.

5.91 The applicant should show how the project has taken advantage of and maximised opportunities to conserve biodiversity and geological conservation interests.

5.94 The applicant's proposal should address the mitigation hierarchy (which supports efforts to conserve and enhance biodiversity), which is set out in the National Planning Policy Framework.

5.95 Compensation ratios relating to the effects of the preferred scheme should be considered in more detail during the design. The application of 2:1 compensation ratio is considered to represent the minimum requirement. However, there are other mechanisms for establishing compensation ratios, such as Defra's biodiversity offsetting metric. Equally, it is important to note that habitat ratios form only one part of potential compensation which should be considered, and the location and quality of any compensation land is of key importance. In this regard, habitat creation, where required, should be focused on areas where the most ecological and ecosystems services benefits can be realised.

5.96 As a general principle, and subject to the specific policies set out below and the Infrastructure Planning (Decisions) Regulations 2010, development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated. Where significant harm cannot be avoided or mitigated, as a last resort appropriate compensation measures should be sought. The development consent order, or any associated planning obligations, will need to make provision for the long term management of such measures.

5.97 In taking decisions, the Secretary of State will ensure that appropriate weight is attached to designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment.

5.103 Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost, it cannot be recreated. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including

ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss. Aged or veteran trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this.

5.104 The proposed development comprised in the preferred scheme should provide many opportunities for building in beneficial biodiversity as part of good design. When considering proposals, the Secretary of State will consider whether the applicant has maximised such opportunities in and around developments, and particularly to establishing and enhancing green infrastructure. The Secretary of State may use requirements or planning obligations where appropriate in order to ensure that such beneficial features are delivered.

5.105 In addition to the habitats and species that are subject to statutory protection or international, regional or local designation, other habitats and species have been identified as being of principal importance for the conservation of biodiversity in England and Wales and therefore requiring conservation action. The Secretary of State will ensure that the applicant has taken measures to ensure that these other habitats and species are protected from the adverse effects of development. Where appropriate, requirements or planning obligations may be used in order to deliver this protection. The Secretary of State will refuse consent where harm to these other habitats, or species and their habitats, would result, unless the benefits of the development (including need) clearly outweigh that harm. In such cases, compensation will generally be expected to be included in the design proposals.

Land use including open space, green infrastructure and Green Belt

5.106 Access to high quality open spaces and the countryside and opportunities for sport and recreation can be a means of providing necessary mitigation and / or compensation requirements. Green infrastructure can enable developments to provide positive environmental and economic benefits.

5.109 Development of land will affect soil resources, including physical loss of and damage to soil resources, through land contamination and structural damage. Indirect impacts may also arise from changes in the local water regime, organic matter content, soil biodiversity and soil process.

5.118 The applicant can minimise the direct effects of a project on the existing use of the proposed site, or proposed uses near the site, by the application of good design principles, including the layout of the project and the protection of soils during construction.

5.119 Where green infrastructure is affected, the applicant should aim to ensure the functionality and connectivity of the green infrastructure network is maintained and any necessary works are undertaken, where possible, to mitigate any adverse impact and, where appropriate, to improve that network and other areas of open space, including appropriate access to National Trails and other public rights of way.

5.123 Public rights of way, National Trails and other rights of access to land are important recreational facilities for walkers, cyclists and equestrians. The applicant is expected to take appropriate mitigation measures to address adverse effects on National Trails, other public rights of way and open access land and, where appropriate, to consider what opportunities there may be to improve access. In considering revisions to an existing right of way, consideration needs to be given to the use, character, attractiveness and convenience of the right of way. The Secretary of State should consider whether the mitigation measures put forward by an applicant are acceptable and whether requirements or other provisions in respect of these measures might be attached to any grant of development consent.

5.125 Where networks of green infrastructure have been identified in development plans, they should normally be protected from development and, where, possible, strengthened by or integrated within it. The Secretary of State will also have regard to the effect of the development upon and resulting from existing land contamination, as well as the mitigation proposed.

Historic environment

5.188 The historic environment includes all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora.

5.189 Those elements of the historic environment that hold value to this and future generations because of their historic, archaeological, architectural or artistic interest are called ‘heritage assets’. Heritage assets may be buildings, monuments, sites, places, areas or landscapes, or any combination of these. The sum of the heritage interests that a heritage asset holds is referred to as its significance. Significance derives not only from a heritage asset’s physical presence, but also from its setting.

5.193 As part of the environmental statement, the applicant should provide a description of the significance of the heritage assets affected by the proposed development, and the contribution of their setting to that significance. The level of detail should be proportionate to the asset’s importance, and no more than is sufficient to understand the potential impact of the proposal on the significance of the asset. Consideration will also need to be given to the possible impacts, including cumulative, on the wider historic environment. At a minimum, the relevant Historic Environment Record should be consulted and the heritage assets assessed using appropriate expertise. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, the applicant should include an appropriate desk-based assessment and, where necessary, a field evaluation. The applicant should ensure that the extent of the impact of the proposed development on the significance of any heritage asset affected can be adequately understood from the application and supporting documents.

5.195 The applicant is encouraged, where opportunities exist, to prepare proposals which can make a positive contribution to the historic environment, and to consider how their scheme takes account of the significance of heritage assets affected. This can include, where possible:

- *Enhancing, through a range of measures such as sensitive design, the significance of heritage assets or setting affected;*
- *Considering measures that address those heritage assets that are at risk, or which may become at risk, as a result of the scheme; and*
- *Considering how visual or noise impacts can affect heritage assets, and whether there may be opportunities to enhance access to or interpretation, understanding and appreciation of the heritage assets affected by the scheme.*

Careful consideration in preparing the scheme will be required on whether the impacts on the historic environment will be direct or indirect, temporary or permanent

5.197 The Secretary of State must also comply with the regime relating to Listed Buildings, Conservation Areas and Scheduled Monuments set out in The Infrastructure Planning (Decisions) Regulations 2010.

5.198 In considering the impact of a proposed development on any heritage assets, the Secretary of State will take into account the particular nature of the significance of the heritage asset and the value that they hold for this and future generations. This understanding should be used to avoid or minimise conflict between their conservation and any aspect of the proposal.

5.199 The Secretary of State will take into account: the desirability of sustaining and, where appropriate, enhancing the significance of heritage assets; the contribution of their settings; and the positive contribution their conservation can make to supporting sustainable communities – including to their quality of life, their economic vitality, and to the public's enjoyment of these assets. The Secretary of State will also take into account the desirability of new development making a positive contribution to the character and local distinctiveness of the historic environment. The consideration of design should include scale, height, massing, alignment, materials, use and landscaping (for example screen planting).

5.201 Once lost, heritage assets cannot be replaced, and their loss has a cultural, environmental, economic and social impact. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. Given that heritage assets are irreplaceable, any harm or loss should require clear and convincing justification.

Appendix 2: National Policy Statement for National Networks 2014

The National Networks National Policy Statement (NN NPS), hereafter referred to as 'NPS', sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England. It provides planning guidance for promoters of nationally significant infrastructure projects on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.

Chapter 1. Introduction

Purpose and scope

1.2 The Secretary of State will use this NPS as the primary basis for making decisions on development consent applications for national networks nationally significant infrastructure projects in England. Other NPSs may also be relevant to decisions on national networks nationally significant infrastructure projects. Under section 104 of the Planning Act the Secretary of State must decide an application for a national networks nationally significant infrastructure project in accordance with this NPS unless he/she is satisfied that to do so would:

- *lead to the UK being in breach of its international obligations;*
- *be unlawful;*
- *lead to the Secretary of State being in breach of any duty imposed by or under any legislation;*
- *result in adverse impacts of the development outweighing its benefits;*
- *be contrary to legislation about how the decisions are to be taken*

1.3 Where a development does not meet the current requirements for a nationally significant infrastructure project set out in the Planning Act (as amended by the Threshold Order), but is considered to be nationally significant, there is a power in the Planning Act for the Secretary of State, on application, to direct that a development should be treated as a nationally significant infrastructure project. In these circumstances any application for development consent would need to be considered in accordance with this NPS. The relevant development plan is also likely to be an important and relevant matter especially in respect of establishing the need for the development.

Consistency of NPS with the National Planning Policy Framework

1.17 The overall strategic aims of the National Planning Policy Framework (NPPF) and the NPS are consistent, however, the two have differing but equally important roles to play.

1.18 The NPPF provides a framework upon which local authorities can construct local plans to bring forward developments, and the NPPF would be a material consideration in planning decisions for such developments under the Town and Country Planning Act 1990. An important function of the NPPF is to embed the principles of sustainable development within local plans prepared under it. The NPPF is also likely to be an important and relevant consideration in decisions on nationally significant infrastructure projects, but only to the extent relevant to that project.

1.19 However, the NPPF makes clear that it is not intended to contain specific policies for NSIPs where quite particular considerations can apply. The National Networks

NPS will assume that function and provide transport policy which will guide individual development brought under it.

1.20 In addition, the NPS provides guidance and imposes requirements on matters such as good scheme design, as well as the treatment of environmental impacts. So, both documents seek to achieve sustainable development and recognise that different approaches and measures will be necessary to achieve this.

Chapter 2. The need for development of the national networks and Government's policy

Summary of needs

2.9 Broader environment, safety and accessibility goals will also generate requirements for development. In particular, development will be needed to address safety problems, enhance the environment or enhance accessibility for non-motorised users. In their current state, development, the national networks will act as a constraint to sustainable economic growth, quality of life and wider environmental objectives.

The need for development of the national road Network

2.16 Traffic congestion constrains the economy and impacts negatively on quality of life by:

- *constraining existing economic activity as well as economic growth, by increasing costs to businesses, damaging their competitiveness and making it harder for them to access export markets. Businesses regularly consider access to good roads and other transport connections as key criteria in making decisions about where to locate.*
- *leading to a marked deterioration in the experience of road users. For some, particularly those with time-pressured journeys, congestion can cause frustration and stress, as well as inconvenience, reducing quality of life.*
- *constraining job opportunities as workers have more difficulty accessing labour markets.*
- *causing more environmental problems, with more emissions per vehicle and greater problems of blight and intrusion for people nearby. This is especially true where traffic is routed through small communities or sensitive environmental areas.*

Chapter 3. Wider Government policy on the national networks

Environment and social impacts

3.2 The Government recognises that for development of the national road and rail networks to be sustainable these should be designed to minimise social and environmental impacts and improve quality of life.

3.3 In delivering new schemes, the Government expects applicants to avoid and mitigate environmental and social impacts in line with the principles set out in the NPPF and the Government's planning guidance. Applicants should also provide evidence that they have considered reasonable opportunities to deliver environmental and social benefits as part of schemes. The Government's detailed policy on environmental mitigations for developments is set out in Chapter 5 of this document.

3.5 Outside the nationally significant infrastructure project regime, Government policy is to bring forward targeted works to address existing environmental problems on the Strategic Road Network and improve the performance of the network. This includes reconnecting habitats and ecosystems, enhancing the settings of historic and cultural heritage features, respecting and enhancing landscape character, improving water quality and reducing flood risk, avoiding significant adverse impacts from noise and vibration and addressing areas of poor air quality.

Chapter 4. Assessment principles

4.3 In considering any proposed development, and in particular, when weighing its adverse impacts against its benefits, the Examining Authority and the Secretary of State should take into account:

- *its potential benefits, including the facilitation of economic development, including job creation, housing and environmental improvement, and any long-term or wider benefits;*
- *its potential adverse impacts, including any longer-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.*

4.4 In this context, environmental, safety, social and economic benefits and adverse impacts, should be considered at national, regional and local levels. These may be identified in this NPS, or elsewhere.

4.5 Applications for road and rail projects (with the exception of those for SRFIs, for which the position is covered in paragraph 4.8 below) will normally be supported by a business case prepared in accordance with Treasury Green Book principles. This business case provides the basis for investment decisions on road and rail projects. The business case will normally be developed based on the Department's Transport Business Case guidance and WebTAG guidance. The economic case prepared for a transport business case will assess the economic, environmental and social impacts of a development. The information provided will be proportionate to the development. This information will be important for the Examining Authority and the Secretary of State's consideration of the adverse impacts and benefits of a proposed development. It is expected that NSIP schemes brought forward through the development consent order process by virtue of Section 35 of the Planning Act 2008, should also meet this requirement.

<u>Environmental Impact Assessment</u>

4.15 All proposals for projects that are subject to the European Union's Environmental Impact Assessment Directive and are likely to have significant effects on the environment, must be accompanied by an environmental statement (ES), describing the aspects of the environment likely to be significantly affected by the project. The Directive specifically requires an environmental impact assessment to identify, describe and assess effects on human beings, fauna and flora, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them. Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 sets out the information that should be included in the environmental statement including a description of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project,

and also the measures envisaged for avoiding or mitigating significant adverse effects. Further guidance can be found in the online planning portal. When examining a proposal, the Examining Authority should ensure that likely significant effects at all stages of the project have been adequately assessed. Any requests for environmental information not included in the original environmental statement should be proportionate and focus only on significant effects. In this NPS, the terms 'effects', 'impacts' or 'benefits' should accordingly be understood to mean likely significant effects, impacts or benefits.

Habitats Regulations Assessment

4.25 Where a development may negatively affect any priority habitat or species on a site for which they are a protected feature, any Imperative Reasons of Overiding Public Interest (IROPI) case would need to be established solely on one or more of the grounds relating to human health, public safety or beneficial consequences of primary importance to the environment.

Alternatives

4.26 Applicants should comply with all legal requirements and any policy requirements set out in this NPS on the assessment of alternatives. In particular:

- *The EIA Directive requires projects with significant environmental effects to include an outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects.*
- *There may also be other specific legal requirements for the consideration of alternatives, for example, under the Habitats and Water Framework Directives.*
- *There may also be policy requirements in this NPS, for example the flood risk sequential test and the assessment of alternatives for developments in National Parks, the Broads and Areas of Outstanding Natural Beauty (AONB).*

Criteria for "good design" for national network infrastructure

4.34 Whilst the applicant may only have limited choice in the physical appearance of some national networks infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting and design measures relative to existing landscape and historical character and function, landscape permeability, landform and vegetation.

Climate change adaptation

4.37 This section sets out how the NPS puts Government policy on climate change adaptation into practice, and in particular how applicants and the Secretary of State should take the effects of climate change into account when developing and consenting infrastructure. Climate change mitigation is essential to minimise the most dangerous impacts of climate change, as previous global greenhouse gas emissions have already committed us to some degree of continued climate change for at least the next 30 years. Climate change is likely to mean that the UK will experience hotter, drier summers and warmer, wetter winters. There is an increased risk of flooding, drought, heatwaves, intense rainfall events and other extreme events such as storms and wildfires, as well as rising sea levels.

4.38 Adaptation is therefore necessary to deal with the potential impacts of these changes that are already happening. New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When

new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the provision of green infrastructure.

4.40 New national networks infrastructure will be typically long-term investments which will need to remain operational over many decades, in the face of a changing climate. Consequently, applicants must consider the impacts of climate change when planning location, design, build and operation. Any accompanying environment statement should set out how the proposal will take account of the projected impacts of climate change.

Chapter 5. Generic impacts

Overview

5.2 Sufficient relevant information is crucial to good decision-taking, particularly where formal assessments are required (such as Environmental Impact Assessment, Habitats Regulations Assessment and Flood Risk Assessment). To avoid delay, applicants should discuss what information is needed with statutory environmental bodies as early as possible.

Biodiversity and ecological conservation

5.20 Biodiversity is the variety of life in all its forms and encompasses all species of plants and animals and the complex ecosystems of which they are a part. Government policy for the natural environment is set out in the *Natural Environment White Paper* (NEWP). The NEWP sets out a vision of moving progressively from net biodiversity loss to net gain, by supporting healthy, well-functioning ecosystems and establishing more coherent ecological networks that are more resilient to current and future pressures. Geological conservation relates to the sites that are designated for their geology and/or their geomorphological importance.

5.22 Where the project is subject to EIA the applicant should ensure that the environmental statement clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance (including those outside England) on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers the full range of potential impacts on ecosystems.

5.23 The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.

5.24 The Government's biodiversity strategy is set out in *Biodiversity 2020: A Strategy for England's wildlife and ecosystem services*. Its aim is to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people. This aim needs to be viewed in the context of the challenge of climate change: failure to address this challenge will result in significant impact on biodiversity.

5.25 As a general principle, and subject to the specific policies below, development should avoid significant harm to biodiversity and geological conservation interests,

including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated. Where significant harm cannot be avoided or mitigated, as a last resort, appropriate compensation measures should be sought.

5.26 In taking decisions, the Secretary of State should ensure that appropriate weight is attached to designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment.

5.32 Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the national need for and benefits of the development, in that location, clearly outweigh the loss. Aged or veteran trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this.

5.33 Development proposals potentially provide many opportunities for building in beneficial biodiversity or geological features as part of good design.80 When considering proposals, the Secretary of State should consider whether the applicant has maximised such opportunities in and around developments. The Secretary of State may use requirements or planning obligations where appropriate in order to ensure that such beneficial features are delivered.

5.36 Applicants should include appropriate mitigation measures as an integral part of their proposed development, including identifying where and how these will be secured. In particular, the applicant should demonstrate that:

- *during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;*
- *during construction and operation, best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised (including as a consequence of transport access arrangements);*
- *habitats will, where practicable, be restored after construction works have finished;*
- *developments will be designed and landscaped to provide green corridors and minimise habitat fragmentation where reasonable;*
- *opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals, for example through techniques such as the 'greening' of existing network crossing points, the use of green bridges and the habitat improvement of the network verge.*

Appendix 3: National Planning Policy Framework 2012

The National Planning Policy Framework (NPPF) set out the Government's planning policies for England and how these are expected to be applied by Local Authorities within their Local Development Frameworks (LDF).

Achieving Sustainable Development:
Chapter 11: Conserving and enhancing the natural environment

109 *The planning system should contribute to and enhance the natural and local environment by:*

- *Protecting and enhancing valued landscapes, geological conservation interests and soils;*
- *Recognising the wider benefits of ecosystem services; and*
- *Minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.*

114 *Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged. Distinctions should be made between the hierarchy of international, national and locally designated sites, so that protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks.*

117 *Local planning authorities should set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure. To minimise impacts on biodiversity and geodiversity, planning policies should:*

- *Plan for biodiversity at a landscape-scale across local authority boundaries; identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation;*
- *Promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan; and, _ Aim to prevent harm to geological conservation interests; and where Nature Improvement Areas are identified in Local Plans, consider specifying the types of development that may be appropriate in these Areas.*

118 *When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:*

- *If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.*
- *Proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments)*

should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly

- *outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;*
- *Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
- *Opportunities to incorporate biodiversity in and around developments should be encouraged; and,*
- ***Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss**; and.*
- *the following wildlife sites should be given the same protection as European sites:*
  - *potential Special Protection Areas and possible Special Areas of Conservation;*
  - *listed or proposed Ramsar sites; and*
  - *sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.*

119 *The presumption in favour of sustainable development (paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined.*

Plan-making

Local Plans

157*. Crucially, Local Plans should:*

- *plan positively for the development and infrastructure required in the area to meet the objectives, principles and policies of this Framework;*
- *be drawn up over an appropriate time scale, preferably a 15-year time horizon, take account of longer term requirements, and be kept up to date;*
- *be based on co-operation with neighbouring authorities, public, voluntary and private sector organisations;*
- *indicate broad locations for strategic development on a key diagram and land-use designations on a proposals map;*
- *allocate sites to promote development and flexible use of land, bringing forward new land where necessary, and provide detail on form, scale, access and quantum of development where appropriate;*
- *identify areas where it may be necessary to limit freedom to change the uses of buildings, and support such restrictions with a clear explanation;*
- *identify land where development would be inappropriate, for instance because of its environmental or historic significance; and*
- *contain a clear strategy for enhancing the natural, built and historic environment, and supporting Nature Improvement Areas where they have been identified.*

Environment

165. *Planning policies and decisions should be based on up-to-date information about the natural environment and other characteristics of the area including drawing, for example, from River Basin Management Plans. Working with Local Nature Partnerships where appropriate, this should include an assessment of existing and potential components of ecological networks. A sustainability appraisal which meets the requirements of the European Directive on strategic environmental assessment should be an integral part of the plan preparation process, and should consider all the likely significant effects on the environment, economic and social factors.*

Appendix4: National Planning Practice Guidance

As highlighted in the Natural Environment section of the NPPG under Biodiversity and ecosystems, the Forestry Commission consider the following sections to be relevant:

What are local ecological networks and what evidence should be taken into account in identifying and mapping them?

The components of an ecological network are explained at section 2.12 of the Natural environment white paper[21].

Relevant evidence in identifying and mapping local ecological networks includes:

- *the broad geological, geomorphological and bio-geographical character of the area, creating its main landscapes types;*
- *key natural systems and processes within the area, including fluvial and coastal;*
- *the location and extent of internationally, nationally and locally designated sites;*
- *the distribution of protected and priority habitats and species[22];*
- *areas of irreplaceable natural habitat[23], such as ancient woodland or limestone pavement, the significance of which may be derived from habitat age, uniqueness, species diversity and/or the impossibilities of re-creation;*
- *habitats where specific land management practices are required for their conservation;*
- *main landscape features which, due to their linear or continuous nature, are important for the migration, dispersal and genetic exchanges of plants and animals, including any potential for new habitat corridors to link any isolated sites that hold nature conservation value, and therefore improve species dispersal;*
- *areas with potential for habitat enhancement or restoration, including those necessary to help biodiversity adapt to climate change or which could assist with the habitats shifts and species migrations arising from climate change;*
- *an audit of green space within built areas and where new development is proposed;*
- *information on the biodiversity and geodiversity value of previously developed sites and the opportunities for incorporating this in developments; and*
- *areas of geological value which would benefit from enhancement and management.*

How are ecosystems services taken into account in planning?

The National Planning Policy Framework states that the planning system should recognise the wider benefits of ecosystem services. Information about ecosystems services is in Biodiversity 2020: A strategy for England's biodiversity and ecosystems services[24]. An Introductory guide to valuing ecosystems services[25] has also been published by Defra along with a practice guide, which could, where appropriate, inform plan-making and decision-taking on planning applications. The National pollinator strategy: for bees and other pollinators in England[26] is a 10 year plan to protect

[21] https://www.gov.uk/government/publications/the-natural-choice-securing-the-value-of-nature
[22] https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications
[23] https://www.gov.uk/guidance/protected-sites-and-areas-how-to-review-planning-applications
[24] https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services
[25] https://www.gov.uk/government/publications/an-introductory-guide-to-valuing-ecosystem-services
[26] https://www.gov.uk/government/publications/national-pollinator-strategy-for-bees-and-other-pollinators-in-england

pollinating insects which support our food production and the diversity of our environment.

(Relevant to NPPF paragraph 109)

How can I find out whether an area is 'ancient woodland'?
A starting point to establish whether an area is ancient woodland is to look at the relevant ancient woodland inventory. These inventories comprise county maps of sites (generally greater than 2 hectares) that are thought to have been continuously wooded since 1600 AD. The national inventory[27] is published and updated by Natural England. Both Ancient Semi-Natural Woodland (ASNW) as well as Plantations on Ancient Woodland Sites (PAWS) are ancient woodland. Both types should be treated equally in terms of the protection afforded to ancient woodland in the National Planning Policy Framework.[28]

How can I find out whether trees that could be affected by a development proposal are 'aged or veteran' trees?
Guidance on the features and importance of veteran trees[29] is provided by Natural England. Local Records Centres and other organisations with an interest in trees may be able to advise on the location of known veteran trees.

(Relevant to NPPF paragraph 118)

[27] http://www.gis.naturalengland.org.uk/pubs/gis/tech_aw.htm
[28] https://www.gov.uk/guidance/natural-environment#biodiversity-and-ecosystems
[29] http://publications.naturalengland.org.uk/publication/75035

Appendix 5: Other relevant documents

The Clean Growth Strategy: Leading the way to a low carbon future[30] (Updated April 2018)

Page 107: What is natural capital? "Natural capital enables us to think about our natural environment and the countryside as a set of valuable assets (for example, forests, clean air, soils, species, freshwaters, oceans and minerals). Like any asset, natural capital, if maintained and invested in, provides flows of services to the economy and society. These include food, energy, carbon sequestration, pollutant removal, flood risk reduction, recreational and educational opportunities, health benefits and many others."

Paragraph 7: "During the 2020s we need to accelerate the rate of tree planting, working towards our 12 per cent tree cover aspiration by 2060. … Recently published natural capital accounts by the Office for National Statistics show that Britain's woodlands provide services of £2.3 billion per year to the economy in terms of recreation, carbon sequestration, timber and air pollutant removal."

A Green Future: Our 25 Year Plan to Improve the Environment[31] (Updated February 2018)

Foreword from the Prime Minister: "Our natural environment is our most precious inheritance. The United Kingdom is blessed with a wonderful variety of natural landscapes and habitats and our 25 Year Environment Plan sets out our comprehensive and long-term approach to protecting and enhancing them in England for the next generation. … By using our land more sustainably and creating new habitats for wildlife, including by planting more trees, we can arrest the decline in native species and improve our biodiversity."

Foreword from the Secretary of State: "Respecting nature's intrinsic value, and the value of all life, is critical to our mission. For this reason we safeguard cherished landscapes from economic exploitation, protect the welfare of sentient animals and strive to preserve endangered woodland and plant life, not to mention the greening of our urban environments. … We need to replenish depleted soil, plant trees, support wetlands and peatlands, rid seas and rivers of rubbish, reduce greenhouse gas emissions, cleanse the air of pollutants, develop cleaner, sustainable energy and protect threatened species and habitats."

Page 19: "The value of natural capital is routinely understated. If we look at England's woods and forests, for example, as a national asset, using a natural capital approach, the value of the services they deliver is an estimated £2.3bn. Of this sizeable sum, according to a recent study, only a small proportion – 10% – is in timber values. The rest derives from other benefits provided to society, such as human recreation and carbon sequestration – the process by which trees lock-up and store carbon from the atmosphere."

Page 47: "We will increase tree planting by creating new forests, and incentivising extra planting on private and the least productive agricultural land, where appropriate. This will support our ambition to plant 11m trees. … We will not focus solely on planting, however; we will also support increased protection of existing trees and forests. … Beyond the economic benefits, the Government recognises the significant heritage value and irreplaceable character of ancient woodland and veteran trees. We are committed to ensuring stronger protection of our ancient woodlands, making sure

[30] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf

[31] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

they are sustainably managed to provide a wide range of social, environmental, societal and economic benefits."

Industrial Strategy White Paper "Building a Britain fit for the future"[32]
(Published November 2017)
Page 43: "We also want everyone to feel the benefits of clean growth, so we will work to create a future where our cities benefit from cleaner air, our businesses from enhanced resource security and our countryside from regenerated natural capital."
Page 135: "We will work not just to preserve, but to enhance our natural capital – the air, water, soil and ecosystems that support all forms of life – since this is an essential basis for economic growth and productivity over the long term."
Page 148: "We are committed to moving towards a more circular economy – to raising productivity by using resources more efficiently, to increasing resilience by contributing to a healthier environment, and to supporting long-term growth by regenerating our natural capital."
Page 148: "The Natural Capital Committee has advised that carefully planned and targeted investments in natural capital – such as woodland planting, peatland restoration and wetland creation – can deliver significant economic growth, and generate returns of up to nine times the costs."

The UK Forestry Standard[33] (4th edition published August 2017)
Page 22-23 "Areas of woodland are material considerations in the planning process and may be protected in local authority Area Plans. These plans pay particular attention to woods listed on the Ancient Woodland Inventory and areas identified as Sites of Local Nature Conservation Importance SLNCIs).

Managing ancient and native woodland in England[34] (updated August 2016)
Ancient woodlands are increasingly being recognised and valued for the more subtle yet vital environmental services they provide, including flood alleviation, clean water supplies and carbon sequestration. The Guide provides guidance on how to help woodlands adapt to climate and includes guidance on harvesting woodfuel from native woodland in ways that will enhance biodiversity and heritage.

European Commission Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment[35] (published 2013)
"climate change and biodiversity are generally complex issues with long-term impacts and consequences. EIAs that aim to properly address biodiversity and climate should take this into account and assess the combined impact of any number of different effects. This requires an understanding of evolving baseline trends and an assessment of the cumulative effects of the project on the changing baseline."

Natural England Commissioned Report (NERC 132) Edition 3: Literature review and analysis of the effectiveness of mitigation measures to address environmental impacts of linear transport infrastructure on protected species and habitats[36] (Published November 2013)

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[32] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf
[33] https://www.forestry.gov.uk/ukfs
[34] https://www.forestry.gov.uk/forestry/infd-8azkv9
[35] http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf
[36] http://publications.naturalengland.org.uk/publication/6184646404472832

Contents: "translocation of ancient woodland soils and coppiced stools does not imply that these methods mitigate the loss of ancient woodland. Ancient woodland is an irreplaceable resource, the loss of which cannot be mitigated or compensated."
Table 4.1: the measure should not be interpreted as a successful means of mitigating the fragmentation of ancient woodland; a resource which cannot be re-created through tree planting or habitat translocation due to its complex structure and wider-ranging biodiversity.

BS 42020:2013 Biodiversity. Code of practice for planning and development[37] (published August 2013)
The UK commitment to halt overall loss of biodiversity by 2020 in line with the European Biodiversity Strategy and UN Aichi targets, is passed down to local authorities to implement, mainly through planning policy.

Ancient and other veteran trees: further guidance on management[38] (published February 2013)
This book is about managing ancient and other veteran trees to help prolong their lives and to ensure the continuity of habitat required by many of their associated species.

Government's Policy Statement on forestry and woodlands[39] (published January 2013)
Page 10 "New and better managed woodland also has a role in making our rural and urban landscapes more resilient to the effects of climate change. Our objectives for sustainable woodland creation and management will improve woodlands' resilience to climate change and other threats and enhance its contribution to wider climate change adaptation. Carbon will be sequestered through the growth of new woodlands. The wood products that are harvested from England's woodlands will help to reduce greenhouse emissions from the energy sector directly as woodfuel and from other sectors where timber replaces more energy intensive materials. In addition, our focus on protection will help to ensure that we can safeguard the large store of carbon in England's woodlands."

Impacts of nearby development on ancient woodland – addendum[40]
(published December 2012)
"If disturbance of ancient woodland is to take place then it is vital that the ecology of the wood is well documented and understood before the disturbance takes place. The connection between that woodland and other woods or remnants of woods in the area also needs to be understood as connectivity between patches of woodland is important for promoting species diversity within a landscape. Structural complexity of both the interior of the wood and the woodland edges should also be ensured to maintain habitat quality. Any restoration of woodland patches should be spatially targeted to ensure maximum success."

BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations[41] (published April 2012)

[37] https://shop.bsigroup.com/ProductDetail?pid=000000000030258704
[38] http://ancienttreeforum.co.uk/wp-content/uploads/2015/02/ATF_book.pdf
[39] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221023/pb13871-forestry-policy-statement.pdf
[40] https://www.woodlandtrust.org.uk/mediafile/100168353/Impacts-of-nearby-development-on-the-ecology-of-ancient-woodland-addendum.pdf
[41] https://shop.bsigroup.com/ProductDetail/?pid=000000000030213642

Trees are important elements of green infrastructure, contributing to urban cooling through evapotranspiration and providing micro-climatic effects that can reduce energy demands in buildings. They therefore represent a key resource that can significantly contribute to climate change adaptation.

Biodiversity 2020: a strategy for England's wildlife and ecosystem services[42] (published August 2011).
Paragraph 2.16 - Further commitments to protect ancient woodland and to continue restoration of Plantations on Ancient Woodland Sites (PAWS).

Natural Environment White Paper "The Natural Choice"[43] (published June 2011)
Paragraph 2.53 - This has a "renewed commitment to conserving and restoring ancient woodlands".
Paragraph 2.56 – "The Government is committed to providing appropriate protection to ancient woodlands and to more restoration of plantations on ancient woodland sites".

Natural Environment and Rural Communities Act 2006[44] (published October 2006)
Section 40(1) imposes a duty to conserve biodiversity:

> "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."

Section 40(3) of the Act explains that:

> "Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat".

The duty applies to all public body (including government departments and local authorities) and extends beyond just conserving what is already there to carrying out, supporting and requiring actions that may also restore or enhance biodiversity.

'Making Space for Nature: A review of England's Wildlife Sites and Ecological Network' (the Lawton Report)[45] (published September 2010)
The Lawton Report concluded that isolated nature reserves across England are not sufficient to maintain ecological connectivity because species are unable to move, or adapt quickly enough, in landscapes fragmented by development and intensive agriculture. To reverse the effects of environmental degradation, the Report recommended action at a 'whole landscape' level, interconnecting sites of high quality, which are biologically diverse, and to allow species to move between them.

Impacts of nearby development on the ecology of ancient woodland[46] (published October 2008)
Ancient woodland is a functionally irreplaceable resource for biodiversity that is also an important part of our cultural heritage. The aim of this review is to synthesise existing

[42] https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services
[43] https://www.gov.uk/government/news/natural-environment-white-paper-discussion-document-record-response
[44] http://www.legislation.gov.uk/ukpga/2006/16/section/40
[45] http://webarchive.nationalarchives.gov.uk/20130402170324/http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf
[46] https://www.woodlandtrust.org.uk/mediafile/100168350/Impacts-of-nearby-development-on-the-ecology-of-ancient-woodland.pdf

literature on the direct, indirect and cumulative effects of development on nearby woodland.

Keepers of Time[47] (published June 2005)
A Statement of Policy for England's Ancient and Native Woodland.
Page 10 "The existing area of ancient woodland should be maintained and there should be a net increase in the area of native woodland".

A Habitats Translocation Policy for Britain[48] (published July 2003)
"Available information shows that it is not possible to move species assemblages without substantial changes taking place in the structure of the habitat and its species composition, thus rendering the translocation unsuccessful."

Veteran Trees: A guide to good management[49] (published February 2000)
This handbook provides understanding of best practice in veteran tree management. It gives practical advice on all aspects of managing veteran trees, their habitats and dependent species. All is set in context by an understanding of the way in which trees grow, age and decay.

[47] https://www.forestry.gov.uk/keepersoftime
[48] http://jncc.defra.gov.uk/pdf/habitats_policy.pdf
[49] http://publications.naturalengland.org.uk/publication/75035

HSE

Health and Safety Executive

CEMHD Policy - Land Use Planning
NSIP Consultations
Building 2.2, Redgrave Court
Merton Road, Bootle
Merseyside, L20 7HS

Your ref: TR020003
Our ref: 4.2.1.6419
HSE email: NSIP.applications@hse.gov.uk

FAO
Heathrow Third Runway Team
The Planning Inspectorate
Bristol
BS1 6PN
By e-mail

19/06/2018

Dear Heathrow Third Runway Team

PROPOSED Heathrow Airport Third Runway - EIA scoping consultation (the project)
PROPOSAL BY Heathrow Airport Limited (the applicant)
INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 (as amended) – Regulations 10 and 11

Thank you for your letter of 22nd May 2018 regarding the information to be provided in an environmental statement relating to the above project. HSE does not comment on EIA Scoping Reports but the following information is likely to be useful to the applicant.

HSE's land use planning advice

Will the proposed development fall within any of HSE's consultation distances?

According to HSE's records there are three major accident hazard sites and one major accident hazard pipeline within the proposed redline boundary of this nationally significant infrastructure project:

Major accident hazard sites

1) HSE ref H3791; operated by Heathrow Hydrant Operating Company
2) HSE ref H4367; operated by BA plc and Heathrow airport limited
3) HSE ref H3093; operated by Eveready Hire limited

Major accident hazard pipelines

1) HSE ref 8014; Transco reference 2272; operated by Cadent Gas – Fulmer to Staines bypass

HSE's Land Use Planning advice would be dependent on the location of areas where public may be present and so it is possible that HSE may advise against this proposal. When we are consulted by the Applicant with further information, under Section 42 of the Planning Act 2008, we can update our advice.

Hazardous Substance Consent

The presence of hazardous substances on, over or under land at or above set threshold quantities (Controlled Quantities) will probably require Hazardous Substances Consent (HSC) under the Planning (Hazardous Substances) Act 1990 as amended. The substances, alone or when aggregated with others for which HSC is required, and the associated Controlled Quantities, are set out in The Planning (Hazardous Substances) Regulations 2015.

Hazardous Substances Consent would be required to store or use any of the Named Hazardous Substances or Categories of Substances at or above the controlled quantities set out in schedule 1 of these Regulations.

Further information on HSC should be sought from the relevant Hazardous Substances Authority.

Explosives sites

HSE has no comment to make as there are no licensed sites in the vicinity, regards.

Electrical Safety

No comment from a planning perspective.

Waste

In respect of waste management the applicant should take account of and adhere to relevant health and safety requirements. Particular attention should be paid in respect of risks created from historical landfill (buried waste) sites. More details can be found on HSE's website at: http://www.hse.gov.uk/waste/index.htm

Regulation 5(4) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the assessment of significant effects to include, where relevant, the expected significant effects arising from the proposed development's vulnerability to major accidents. HSE's role on NSIPs is summarised in the following Advice Note 11 An Annex on the Planning Inspectorate's website - Annex G – The Health and Safety Executive . This document includes consideration of risk assessments on page 3.

Please send any further electronic communication on this project directly to the HSE's designated e-mail account for NSIP applications. Alternatively, any hard copy correspondence should be sent to:

Mr Dave Adams (MHPD)
NSIP Consultations
2.2 Redgrave Court
Merton Road, Bootle,
Merseyside L20 7HS

Yours sincerely,

[redacted]

Marion Davies

PP
Dave Adams
(CEMHD4 Policy)

Heathrow Strategic Planning Group
c/o Slough Borough Council,
St Martins Place, 51 Bath Rd,
Slough, SL1 3UF

Your contact: Brendon Walsh

Date: 19th June 2018

Email to: HeathrowAirport@pins.gsi.gov.uk

Dear Sir/Madam,

Re: Application by Heathrow Airport Limited for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) EiA Scoping consultation.

We have pleasure in providing the Heathrow Strategic Planning Group (HSPG) written response to the Heathrow Airport Scoping Consultation. HSPG welcomes the opportunity to comment on Heathrow Airports EiA Scoping Report.

Background to the HSPG

HSPG is a group of 9 authorities, 3 Local Enterprise Partnerships and a Community Interest Company, working together to proactively plan ahead for expansion of Heathrow airport, regardless of support or opposition. The Group is seeking to maximise the benefits of expansion (e.g. economic and infrastructure improvements) and minimise and mitigate against the negative impacts (environmental, such as noise and air quality).

The purpose of the HSPG is to:

- work collaboratively in creating and delivering a vision for the Heathrow sub-region;
- enable more coordinated and consistent planning for and management of the local and sub-regional benefits and impacts of the airport through strategy and policy formulation;
- share information and expertise and collaborate where appropriate; and
- build partnership, lobby and be a collective voice on matters of sub-regional planning.

The Group is essentially strategic but practical and its precise role and ways of working will evolve and change to best respond to the decisions of Government, Heathrow Airport Limited and events. However, initiatives and projects arising from the spatial relationship of local authorities with Heathrow, but not necessarily predicated on the outcome of the decision of the third runway, would still benefit from wider sub regional engagement.

The members of the HSPG represent the local authorities and other public organisations responsible for land use planning, transport, environment, economic development and sustainable development in the sub-region area surrounding Heathrow Airport. The Group is independent from Heathrow Airport Ltd and individual member organisations have their own policy positions on the proposal for a third runway and changes to aircraft flightpaths and operations.

Summary of Response to Scoping Report

Individual member organisations of HSPG and local authorities may be making their own representations to the Scoping Consultation. Our full Scoping Report response is appended to this letter in Appendix 1, a summary of our response is provided below:

Further Scoping Report - The Scoping Report implies that a further Scoping Report could be produced once a greater level of design detail is available. HSPG would support production of a further Scoping Report to ensure the focus of the EIA is properly directed and identify appropriate mitigation measures as early in the assessment process as possible.
Relationship between ACP and DCO - Further detail on the relationship and interaction between the ACP and DCO should be provided to ensure that the EIA provides a fair and accurate assessment of the environmental effects of the proposal.

Rochdale Envelope Approach - HSPG recognises that the scheme is still at options masterplanning stage and there are elements of each component which are undefined, and will need a degree of flexibility up to and including the final DCO scheme. However, the Rochdale Envelope Approach is currently poorly defined in the Scoping Report in relation to individual environmental topics and does not fully adopt best practice and the approach set out in PINS Advice Note Nine. The Rochdale Envelope approach should ensure the assessment of a reasonable worst case, i.e. a conservative approach to each of the topic areas. The scheme parameters to be assessed may therefore vary by topic area, depending on what configuration of elements are the 'worst-case' for each topic. This is a standard approach adopted on several similar major schemes where design flexibility has been required, but is not adequately set out in the Scoping Report at present. Transparency in method and application of a Rochdale Envelope approach will allow for a comprehensive assessment and identification of mitigation measures for the local community, whilst retaining flexibility for amendments as the plans evolve.

Waste assessment - HSPG would like to see waste issues included as a fully integrated part of the EIA. This will ensure cumulative and in-combination waste effects are identified and addressed and the significance of any potential effects are identified.

Water environment (surface water) assessment - It is considered that there are significant flaws in the methodology proposed for surface water assessment which does not adhere to best practice guidance and appears to adopt methods which are not relevant to the types of issues likely to be associated with the proposal. HSPG recommend a full review and update of the proposed assessment approach for surface water issues as it is currently not considered fit for purpose. See further comments below and attached.

Significance of 'moderate' effects - Moderate effects should be considered significant in all cases and appropriate mitigation applied accordingly – this is in accordance with best practice. Otherwise, a very robust argument and transparent process for determining which moderate effects are not significant needs to be demonstrated in the EIA process.

Air Quality – Key observations include:

- The core assessment area should be extended to take account of (i) the DCO boundary; (ii) Additional Development Areas; (iii) existing and proposed AQMAs for all affected local authorities
- IAQM Screening Criteria should be used to identify affected road links
- The assessment of compliance should include consideration of the National Emission Ceilings Regulations, in addition to the AQS Regulations.
- Assessment of compliance with EU limit values should be broader than use of the PCM model alone
- Monitoring data from relevant local authorities in a wider study area should be incorporated in the assessment.
- Detailed air quality assessment of traffic emissions during the construction phase should be undertaken, including HGV movements, worker vehicles, and temporary traffic management, and any increase in freight movements once operational.
- Detailed screening of construction rail emissions should be undertaken.

Biodiversity- Key observations include:

- HSPG would like to see a commitment to ensuring all effects of local or negligible significance are captured in the Biodiversity Offsetting strategy and the mechanisms for achieving this. Clarification of the value of Local sites (LNRs and SLINCs).
- Clarification required on how ecosystem services and long-term management of compensation sites are being taken into consideration in the EIA and design process.
- Provision of preliminary biodiversity net gain calculations.
- Clarification that surface water run-off will be assessed in terms of volumes and flooding and the effects on biodiversity.
- Effects on bat species in relation to SACs should be assessed under the HRA.

Carbon and other greenhouse gases and climate change – Key observations include:

- Further detail required on what specific items will be included in the carbon assessment, which parts of the calculation will be based on actual project data and which will be based on proxy data.
- Details on the approach to quantify and present carbon offsetting/sequestration to be provided.
- Further detail required on how 'professional judgement' will be used to determine significance of emissions.
- Clarification on reasons why airport supporting facilities have been scoped out of the GHG emission calculations.
- Local measures to address climate change should be considered in the package of mitigation measures.
- HSPG to be consulted on the Climate Change Adaptation Plan.

Community – Key observations include:

- Set out approach to assessing effects on other community facilities, currently the method is focused on recreational spaces and routes.
- Clarify how the effects on community viability will be assessed with reference to the effect on population and demographics.

- Local workers should be included as a potential receptor.
- Confirm that the airport supporting facilities that have been scoped out as not relevant for the community topic could not potentially affect the community (either temporary or permanent)
- Further detail required on the level of parking required has been calculated and whether this allows for scenarios for reduced levels of parking
- Further detail required on embedded mitigation measures such as the compensation package and community mitigation fund.

Economics and employment – Key observations include:

- The assessment needs to include analysis of the net additionality of socio-economic impacts The Industrial Strategy is the key national economic development document and the socio-economic assessment needs to show how the scheme aligns with it.

Historic Environment – Key observations include:

- Significant operational effects relating to visual changes to the settings of heritage assets beyond the Core Study Area, within the ZTV, should be included in the assessment.
- Criteria for assessing the contribution of setting to the significance and appreciation of the assets should be clearly set out and defended in the assessment.
- HSPG would expect to see responsive nonstandard, detailed design around historic village cores and in areas where historic character survives, to enhance it and the sense of place.

Health – Key observations include:

- The health assessment should consider the health and wellbeing impacts of changes in local house prices and difficulties in selling homes
- Safety issues should be considered as part of both construction and operation.
- There should be explicit mention that the health assessment will consider the key health outcomes: non-communicable disease, mental health and wellbeing, injury and nutritional disorders.
- Mental health and wellbeing should be the term used not just wellbeing which is too broad and is decoupled from the fact that adverse effects on wellbeing can lead to mental health/ill health effects.
- The following receptors should be included: Users of the airport, Airport staff/ People who work in the airport, Visitors to the local area and Open, green and play spaces.
- Flooding (assessment and mitigation) should be included in the assessment.
- The health assessment should assess individual components separately e.g. using a health impact table/matrix, and then develop a combined assessment of significance.
- A quantification of the health outcomes of modelled changes in air quality and noise should be provided to HSPG, particularly for sensitive receptors like schools.

Landscape and visual amenity- Key observations include:

- Integrate additional considerations into the design including London Green Grid, landscape character variations, vegetated and open space areas ad land requiring remediation.
- Develop and share a 3D model for visualisation of the scheme.
- Review views westwards from selected high points in outer London and protected views or views within and surrounding Windsor.
- Provide a strategy which sets out the equivalency of open space and a rationale for its location to demonstrate that the land for open space is on an ‘equally advantageous’ basis.

Land quality – Key observations include:

- HSPG would like to see integration of landfill remediation into the mitigation package for the scheme including commitments for specific sites.

Noise and vibration – Key observations include:

- Worst case scheme parameters should be adopted in the assessment in relation to flight paths.
- Quantitative approaches to cumulative assessment in relation to noise should be explored and justification for a qualitative/quantitative method provided.
- If the project is taking existing noise insulation into account, HSPG would expect to see verification that noise insulation is still working as intended in the relevant properties.

Traffic and transport – Key observations include:

- A list of sensitive areas on the local road network should be developed in conjunction with HSPG to inquorate in the assessment.
- We note the ES Scope states at Chapter 17, para 17.8.1 that “no effects have been scoped out of the assessment”, however the prescriptive use of the thresholds outlined in the IEA Guidelines may potentially

scope out sensitive locations due to the simplistic nature of this approach. Further evidence that no effects will be overlooked is required.
Water Environment – Key observations include: • It is considered that there are significant flaws in the methodology proposed for surface water assessment (see comments above) which is not considered fit for purpose. • In relation to groundwater, the methodology is considered appropriate, but potential effects in relation to the Chalk should be included in the assessment, or justification provided for scoping out. • In relation to flood risk, the FRA and EIA should adopt DMRB significance criteria and be NPPF compliant. The risk of sewer flooding should be included in the assessment. All floodplain compensation areas should be located away from any areas of development allocated in the local plan and HSPG will expect to receive more detail of the ownership and maintenance responsibilities of the floodplain compensation areas. Hydraulic modelling should be undertaken to demonstrate that there are no adverse impacts to flood risk as a result of culverting the river corridor or any new open channels.

The Scoping Report states in places there is agreement from HSPG on a number of matters, it should be noted HSPG have not yet given agreement to any of the emerging proposals. Consultation is still underway on a range of proposals incluidng environmental specialist areas. .

Should you have any questions or require any further information, please do not hesitate to contact me at admin@heathrowstrategicplanninggroup.com.

Yours faithfully,

[redacted]

Brendon Walsh
Chair of the Heathrow Strategic Planning Group

On behalf of the following HSPG member organisations:

- London Borough of Hounslow,
- Slough Borough Council,
- South Bucks District Council,
- Buckinghamshire County Council,
- London Borough of Ealing,
- Spelthorne Borough Council,
- Runnymede Borough Council,
- Surrey County Council,
- Thames Valley Berkshire LEP,
- Bucks and Thames Valley LEP,
- Enterprise M3 LEP,
- Colne Valley Park CIC; and
- Royal Borough of Windsor and Maidenhead,

Appendix 1 – HSPG full response to Scoping Report.

INTRODUCTORY CHAPTERS 1-4, CHAPTER 19 – Outline Structure of ES				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
General	Contents	No overall contents page	Future reports should include an overall contents page to facilitate better navigation of the document for consultees.	Include an overall contents page in future reports.
Chapter 1 - Introduction	Volume 1, Chapter 1 (Introduction), Paragraph 1.2.5	*'The components themselves are well determined and their final locations and detailed design are being refined'* – It is unclear exactly what this statement means and how it related to the scheme to be assessed.	Refer to comments below regarding Rochdale Envelope approach and the need to clearly set out the parameters and flexibility of each of the design components at each stage of assessment.	HSPG to be consulted on the Rochdale Envelope approach to be applied to ensure assessment of reasonable worst case.
	Volume 1, Chapter 1 (Introduction), Paragraph 1.2.5	Section notes that a 'further Scoping Opinion' may be sought in future. In what circumstances would a further Scoping Report be issued for consultation? HSPG is concerned that the need for a further Scoping Report implies that the scheme is insufficiently developed at present for an informed Scoping Opinion to be adopted by PINS. The current Scoping Report suffers due to a very high degree of uncertainty on scheme elements at present.	HSPG would support production of a further refined Scoping Report for consultation once further scheme details have been developed; this would ensure the assessment effort is focussed on the key environmental risks and appropriate mitigation is built into the design at an early stage.	HSPG would support production of a further Scoping Report once a greater level of design detail is available to ensure the focus of the EIA is properly directed and identify appropriate mitigation measures as early in the assessment process as possible.
	Volume 1, Chapter 1, Section 1.7.11	The relationship between the ACP and DCO processes is not clearly set out here, i.e. *'coordinated but kept separate throughout'*. It is accepted that indicative flight paths will need to be adopted in the EIA, but what will the mechanisms be to ensure some integration in the approach?	Greater clarity on the relationship and interaction between the ACP and DCO going forward is required, which will ensure that the EIA provides a fair and accurate assessment of the environmental effects of the proposal.	Further detail on the relationship between the ACP and DCO and the mechanisms to be adopted to ensure an integrated approach.
Chapter 2 – Description of the existing site and its surroundings	Volume 1, Chapter 2	Provides an appropriate summary of the existing site.	More detailed information on the existing site would be expected to be included in the PEIR and ES.	More detailed information on the existing site would be expected to be included in the PEIR and ES.

INTRODUCTORY CHAPTERS 1-4, CHAPTER 19 – Outline Structure of ES				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Chapter 3 – The DCO Project	Volume 1, Chapter 3	<u>Rochdale Envelope Approach</u> HSPG recognises that the scheme is still at options masterplanning stage and there are elements of each component which are undefined, and will need a degree of flexibility up to and including the final DCO scheme. However, at present HSPG consider that the approach to the Rochdale Envelope to be adopted at later stages of assessment is poorly defined in the Scoping Report in relation to treatment of individual environmental topics. The Rochdale Envelope approach should ensure the assessment of a reasonable worst case, i.e. a conservative approach to each of the topic areas. The scheme parameters to be assessed may therefore vary by topic area, depending on what configuration of elements are the 'worst-case' for each topic. This is a standard approach adopted on several similar major schemes where design flexibility has been required, but is not adequately set out in the Scoping Report at present. The flexibility requirements inherent in each major component of the development is considered to be adequately addressed in the Scoping Report but will need to be reviewed and updated as the scheme design progresses.	Transparency in method and application of a Rochdale Envelope approach will allow for a comprehensive assessment and identification of mitigation measures for the local community, whilst retaining flexibility for amendments as the plans evolve.	The Rochdale Envelope Approach is currently poorly defined and does not fully adopt best practice and the approach set out in PINS advice note Nine. Recommend review of PINS advice note Nine and the setting out of a more clearly defined approach. HSPG to be consulted on the Rochdale Envelope approach to be applied to ensure assessment of reasonable worst case.
Chapter 4 – Approach to EIA Scoping	Volume 1, Chapter 4, Section 4.2.6	This section states that *..'the topic chapters consider the environmental effects of the full range of options, to ensure that the likely significant effects of each of the component*	The combination of elements representing the worst case for each environmental topic would represent a	The Rochdale Envelope Approach is currently poorly defined and does not accurately adopt best practice and the approach set out in PINS advice note Nine.

INTRODUCTORY CHAPTERS 1-4, CHAPTER 19 – Outline Structure of ES				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		options have been scoped into the assessment, meaning the scoping exercise will remain applicable and robust after the options have been further refined...' Refer to comments above on Rochdale Envelope approach – this statement does not suggest the adoption of a transparent and robust Rochdale Envelope approach.	more comprehensive and useful method while still retaining flexibility in the design.	Recommend review of PINS advice note 9 and more clearly defined approach. HSPG to be consulted on the Rochdale Envelope approach to be applied to ensure assessment of reasonable worst case.
	Volume 1, Chapter 4, Section 4.4	Consideration of waste is proposed to be excluded from the EIA as it will be covered in other DCO products including the Resource Management Plan. This is not typical of similar DCO EIAs, and the approach risks ignoring significant environmental effects of the proposal in relation to waste and materials management, difficulties in identifying cumulative effects, and the effects on traffic and local communities, if not fully integrated in EIA process.	An integrated waste assessment within the EIA process will ensure that all potentially significant effects are considered, mitigation measures identified and the receptors directly and indirectly affected by waste-related issues clearly identified.	HSPG would like to see waste issues included as a fully integrated part of the EIA. This will ensure cumulative and in-combination waste effects are identified and addressed and the significance of any potential effects are identified.
	Volume 1, Table 4.3	Generic significance matrix and preceding text indicates that 'moderate' effects would be considered usually significant, but in some topic specific circumstances, may be deemed not significant. All other levels of effect are deemed non-significant (marked green in Table 4.3). EIA best practice almost always adopts an approach which defines major and moderate effects as significant. It is also not clear how the decision as to whether a moderate effect is significant will be made.	Moderate effects should be considered significant in all cases and appropriate mitigation applied accordingly – this is in accordance with best practice. Otherwise, a very robust argument and transparent process for determining which moderate effects are not significant needs to be demonstrated.	Moderate effects should be considered significant in all cases and appropriate mitigation applied accordingly – this is in accordance with best practice. Otherwise, a very robust argument and transparent process for determining which moderate effects are not significant needs to be demonstrated.
Chapter 19 – Outline Structure of the ES	Volume 1, Chapter 19	HSPG question the logic of separating the cumulative effects and in-combination effects. A combined chapter in the PEIR/ES would be in keeping with best practice and ensure all interactions are identified and visible in one place.	A combined cumulative and in-combination assessment would reflect best practice and ensure all interactions and effects on local communities are identified.	Combined cumulative/in-combination chapter recommended for PEIR/ES.
	Volume 1, Chapter 19	A section describing the Rochdale Envelope approach to be adopted and any remaining	See comments above re Rochdale Envelope approach and clearly setting out parameters and	See comments above re Rochdale Envelope approach and clearly setting out parameters

INTRODUCTORY CHAPTERS 1-4, CHAPTER 19 – Outline Structure of ES				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		flex in the design should be included in the PEIR and ES. The assessment parameters of the scheme for each environmental topic should also be set out in each topic chapter.	flexibility for each scheme element and environmental topic assessment.	and flexibility for each scheme element and environmental topic assessment.

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 5 (Air Quality), Section 5.4 (Study Area), Para 5.4.4 Volume 2, Figure 3.1 and 5.1	**<u>Extent of the core assessment area</u>** The initial core assessment area is proposed as a grid 12 km by 11 km centred on the existing Heathrow Planning Boundary. Whilst it is noted that the boundaries may be subject to change (based on identification of affected roads, it is our view that the initial assessment area is too limited in spatial extent, particularly to the west where it appears not to acknowledge the location of the new runway. It also omits the Additional Development areas shown in Figure 3.1.	The initial core assessment area should as a minimum use the DCO boundary as a basis, not the existing planning boundary, and apply a suitable buffer around it on a precautionary basis so as to not exclude important baseline information. Slough Borough Council is expected to declare an AQMA in Langley, slightly further west than the extent of the core assessment area, in addition to their existing AQMAs adjacent to the M4 which may be affected by the proposals. The study area should actively include these existing and proposed AQMAs which may similarly have been excluded on the basis of the initial, limited study area.	Extend the core assessment area to take account of (i) the DCO boundary; (ii) Additional Development Areas; (iii) existing and proposed AQMAs for all affected local authorities (HSPG to coordinate provision of data?)
	Volume 1, Chapter 5 (Air Quality), Section 5.4 (Study Area), para 5.4.9	**<u>Identification of affected roads</u>** The spatial limit of the core assessment area may be extended if traffic modelling indicates that traffic movements on links outside the proposed 12 km by 11 km grid are likely to be affected. The report states that Highways	A precautionary approach to identification of affected road network, particularly in light of the limited extent of the initial core assessment area and poor air quality in some local urban areas, is preferred. The IAQM[2] (2017) land-use planning guidance includes more stringent screening criteria, set specifically with land development in mind, including that	Use IAQM Screening Criteria to identify affected road links

[2] EPUK & IAQM Land Use Planning & Development Control: Planning for Air Quality. January 2017.

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		England DMRB (2007)[1] screening criteria will be used to determine whether road links will be affected: - Road alignment will change by 5 m or more - Daily traffic flows will change by 1,000 Annual Average Daily Traffic (AADT) or more - HDV flows will change by 200 AADT or more - Daily average speed will change by 10km/hr or more - Peak hour speed will change by 20km/hr more. The HE's guidance is intended for use on schemes affecting the Strategic Road Network, which would typically move traffic away from populated areas. It was not intended for land development which has the potential to increase flows on roads in urban areas. The DMRB air quality guidance was developed over 10 years ago, at a time when (i) less was known about the health effects of NO_2, now understood to be associated with morbidity (not just in combination with PM), and (ii) when vehicle emission reductions were expected to result in lower concentrations in future, a trend which has not been realised in many areas (despite certain of the newest, mostly petrol, vehicles having lower emissions closer to the latest standards). The scoping report shows that local NO_2 concentrations are high and a downward trend is not clearly apparent, thus a smaller change now may be of greater importance than it was in 2007. AQMAs continue to be declared, specifically in congested areas where emission rates have historically underestimated actual	within urban areas. It includes the following traffic flow thresholds: - Changes in LDV flows by (i) more than 100 AADT within or adjacent to an AQMA; or (ii) more than 500 AADT elsewhere; - Changes in HDV flows by (i) more than 25 AADT within or adjacent to an AQMA; or (ii) more than 100 AADT elsewhere. The IAQM notes that "*where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate*." For example, using DMRB, any roads where there is an increase of fewer than 200 HGVs per day would not be assessed in detail in the EIA. By contrast, IAQM guidance states that an increase of 25 HGV per day in an AQMA should trigger a detailed air quality assessment, or 100 outside an AQMA. These criteria are considered more appropriate in urban settings where smaller changes in air quality may be critical to achieving compliance with EU limit values. Given (i) the proximity to current and planned AQMAs, (ii) the proximity to areas of known Limit Value exceedance as modelled by Defra's PCM (see comments on the limitations of this national scale model), and as demonstrated by local monitoring, (iii) the magnitude of the proposed development and duration of the construction period, (iv) uncertainty of future baseline projections, (v) the range of uncertainty of the forecast impacts of the Surface Transport and Freight Strategies, it is recommended the study takes a precautionary approach and applies IAQM screening criteria for changes to traffic flows, as a minimum those in urban areas and existing and proposed AQMAs, in order to identify a robust study area and ensure potentially significant impacts are not missed.	

[1] Highways Agency, Design Manual for Roads and Bridges. Volume 11. Section 3. Environmental Assessment Techniques. Part 1. HA207/07. Air Quality, 2007

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		exhaust conditions (a point acknowledged in Appendix 5.1, para 1.4.6). Arguably, then, a smaller increment could now result in a significant effect, particularly within AQMAs in town centres.		
	Volume 1, Chapter 17 (Traffic and Transport), Section 17.4 (Study Area), para 17.4.8	The traffic assessment will consider only areas with change in flows of 30% or 10% HGV flows in sensitive areas. It is important that potential air quality impacts within AQMAs are given due consideration even where these may not fall below the thresholds for the traffic assessment. A numerical change in HGV numbers is preferable as a criterion to a percentage change.	The traffic assessment should include consideration of impacts on AQMAs even where the change may be less than 10% of the total flow.	Review traffic assessment methodology to ensure all potential air quality impacts within AQMAs are given due consideration.
	Volume 1, Chapter 5 (Air Quality), Section 5.4 (Study Area), para 5.4.13-14 Volume 2, Figure 5.2	**<u>Assessment of compliance</u>** The methodology proposes comparison with selected PCM links to assess compliance with EU limit values. In fact, the wording in the Airports National Policy Statement is broader than this, requiring the applicant to demonstrate that construction and operation *"will not affect the UK's ability to comply with legal obligations"*. These include EU limit values (as established under the Air Quality Directive 2008), but reference is also made to the National Emission Ceilings Directive. The NPS requires the environmental statement to assess *"existing air quality levels for all relevant pollutants referred to in the AQS Regulations 2010 and the National Emission Ceilings Regulations 2002"* in addition to *"forecasts of levels for all relevant air quality pollutants at the time of opening"*. The Airports NPS does not specifically refer to Defra PCM compliance, but "areas above the	A broader assessment of compliance would provide local authorities in the surrounding areas with more confidence that the development will not affect their ability to comply with legal requirements.	The assessment of compliance should include consideration of the National Emission Ceilings Regulations, in addition to the AQS Regulations. Assessment of compliance with EU limit values should be broader than use of the PCM model alone.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		limit value", requiring a broader definition of compliance (ref. also the recent Silvertown DCO). Revisions to the text of the National Planning Policy Framework signal that it is now not only areas of exceedance that are of concern. Project compliance with objectives and EU limit values must look beyond the PCM modelled area and Greater London Agglomeration as impacts may occur at sites not in the model, and further to the west including M4 Slough AQMA. Given the uncertainties and gaps in Defra's crude nationwide PCM model, which are well known to AQ specialists, it seems wholly inadequate for the proposed development only to focus on compliance on PCM links, not least because it omits the entire M25 as well as M4 through Slough. Furthermore, the rates of decline in concentrations assumed in the PCM model (Table 5.7) bear little resemblance to the trends in the study area (Table 5.3). For example, the PCM model suggests that concentrations in Colnbrook AQMA at roadside are meeting the NO_2 AQ objective; Slough monitoring (Figure 5.5) suggests otherwise.		
		Figure 5.2 shows the "key Defra PCM locations" just as centre points rather than the full extent of the model links.	Compliance along the full extent of PCM links should be assessed not simply as a point, to ensure the worst case receptors are considered.	Assess the full extent of PCM links, not only at the centre points. Revise figure to show the full length.
		Para 5.4.14: As written, this seems to suggest that airport related emissions will not be included in the assessment of compliance.	Emissions from all sources should be included within the compliance assessment, to ensure that all impacts are considered when calculating total change with the proposals.	Include emissions from all sources within the assessment of compliance
		Construction Dust		

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
	Volume 1, Chapter 5 (Air Quality), Section 5.4 (Study Area), para 5.4.15, paras 5.9.10-16	The dust assessment must be transparent in its definition of construction dust emission magnitudes, and of receptor/area sensitivity. A Rochdale Envelope approach should ensure the assessment of a reasonable worst case, i.e. a conservative approach to construction dust emissions estimates.	Transparency in method and application of a Rochdale Envelope approach will allow for a comprehensive assessment and identification of mitigation measures for the local community, whilst retaining flexibility for amendments as the plans evolve.	HSPG to be consulted in definition of construction dust emission magnitudes and area sensitivity and on the Rochdale Envelope approach is applied to ensure assessment of reasonable worst case.
	Volume 1, Chapter 5 (Air Quality), Section 5.4 (Study Area), para 5.4.17, para 5.9.17	**Odour** More detail on potential odour sources locations, strength, and emission type required to allow comment on the proposed assessment method. A qualitative Source-Pathway-Receptor approach for odour (as outlined in IAQM guidance) is reasonable during construction. It is unclear whether detailed modelling of aircraft odorous emissions of VOCs including diffuse emissions from fuel handling is proposed.	Further information should be presented in the PEIR to justify the chosen approach to odour assessment. Good practice mitigation measures for handling, containing and disposing of any contaminated soil or other odour sources should be adequate to ensure no significant impacts on the local community.	Present further analysis in the PEIR to justify chosen approach to odour assessment. Consult with HSPG on recommended odour containment methods
	Volume 1, Chapter 5 (Air Quality), Section 5.5 (Sources of data used in scoping), paras 5.5.4-5 Volume 2, Figures 5.4 and 5.5	**Baseline monitoring data** Figures 5.4 and 5.5 do not include any monitoring from within the Slough AQMA on the M4 It would be more informative to present the data with an intermediate colour for sites approaching/just exceeding the AQS objective (e.g. within 10%), as these may exceed/meet in future with the proposals	Inclusion of additional monitoring data from nearby AQMAs, coupled with more detailed presentation of results, would enhance understanding of the baseline conditions at sensitive locations and potential for improvements/small deteriorations to have a significant impact.	Include monitoring data from relevant local authorities in a wider study area. Present monitoring data with an intermediate colour for sites approaching the objective (e.g. within/over 10%).
	Volume 1, Chapter 5 (Air Quality), Section 5.6 (Baseline Conditions)	**Baseline Conditions** **Para 5.6.3:** This could also acknowledge the portion of PM that is formed by secondary particulate formation following emission of NO_X and SO_2 (of which aircraft and land transport are a key source)		

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		Table 5.3: - Although not formally removed from the air quality strategy[3], the higher benzene objective for 2003 is essentially superseded by the lower limit to be achieve by 2010. The annual mean objective for $PM_{2.5}$ (as alluded to in 5.6.7) is not included in this table.		Include $PM_{2.5}$ annual mean objective
		Para 5.6.6: This should reference AQMA which may be on a route affected by additional traffic as a result of the airport expansion. For instance, both the Slough M4, and the proposed new AQMA in Langley.	AQMAs in a potentially wider study area to be considered, noting that the IAQM criteria for traffic changes are more stringent. Inclusion of additional AQMAs in the assessment will provide HSPG with information on where small changes may have a significant impact.	Ensure definition of study area and description of baseline within it is an iterative process
		Para 5.6.13 – CO objective/concentrations should be described in units of mg/m^3		
		Table 5.4: The scoping report has not included a complete analysis of the data such as trends. Inclusion of 2017 data would help illustrate recent trends as 2016 is generally considered a poor year for air quality. Some monitoring sites appear at first sight not to show any clear trend, many are stable and some may be increasing. This is in contrast to the justification provided for use of DMRB traffic change criteria (para 5.4.11), which focuses on the expected reductions in vehicle emissions in future.	Statistical analysis of at least 5 years' data should ideally be reviewed in the PEIR to build a robust baseline and thus ensure that future projections are appropriate and realistic	Include trend analysis at PEIR stage
		Paras 5.6.20 and 5.6.21: Other information sources to provide baseline evidence regarding dust deposition and/or odour would be useful in order to establish a robust starting point. Does Heathrow maintain a complaints log regarding its activities? Is there any further evidence or monitoring from the Environmental Management System?		Include information from historic Heathrow surveys of dust and odour
		Para 5.6.21: Information regarding the scope of the baseline odour surveys is limited.	A robust monitoring regime will help to ensure appropriate mitigation is put in place	What will the surveys consider – sniff tests, specific, indicator

[3] Defra (2007) Air Quality Strategy https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
				compounds or odour by olfactometry?
		<u>Likely Significant Effects</u>		
	Volume 1, Chapter 5 (Air Quality), Section 5.7 (Likely significant effects)	**Para 5.7.1:** Limiting the scope of the road traffic assessment to NO_X/NO_2 and $PM_{10/2.5}$, is considered appropriate. It is noted VOCs will also be included for aircraft emissions. If industrial processes associated with the airport are specific emitters of other pollutants e.g. SO_2, heavy metals, these should also be considered.		
		Table 5.8: No reference to ecological sites as receptors.	**Table 5.8:** Receptors in final column should also include ecological sites.	Include ecological sites as receptors in Table 5.8.
		Table 5.8: The scope of the assessment for the construction phase includes emissions from construction vehicles and plant through fuel combustion that could increase concentrations of NO_2 and PM. Emissions from worker vehicles accessing the site appear not to have been considered. Further, it is unclear whether an assessment of road traffic emissions will be undertaken during construction as well as operation. Table 17.3 of Chapter 17 (Traffic and transport) appears comprehensive in its coverage of likely effects. Consideration of HGV impacts in the air quality chapter, given a) significant construction movements b) possible freight parking area (para 5.10.6) and c) increase in freight at the airport, appears weak in comparison.	A conservative approach to the assessment of construction traffic emissions should be taken in the event of uncertainty regarding phasing of works. This should include both HGV and worker movements, as well as temporary traffic management, particularly with regard to the M25 works which may displace traffic. Given the timeframes for construction works, and the extensive changes proposed to the road network once operational, plans to manage the traffic disruption should be set out (e.g. diversions, contraflow, or overnight works), and a suitably detailed air quality assessment undertaken to identify mitigation.	Detailed air quality assessment of traffic emissions during the construction phase, including HGV movements, worker vehicles, and temporary traffic management, and any increase in freight movements once operational.
		Under mitigation options for the construction phase (para 5.10.5), it is noted opportunities are being investigated to maximise the transport of bulk construction materials by rail, as a means of reducing construction traffic and emissions. If this option is taken forward, rail freight emissions should be subject to screening at PEIR stage. Note screening criteria within Defra's Local Air Quality Management Technical Guidance TG	A detailed approach to the screening of construction rail emissions would be welcome in the PEIR, which should as a minimum include identification of sensitive receptors within 30 m of the proposed freight routes and investigation of current NO_2 concentrations at those receptors, and potential for impacts in combination with construction traffic emissions, prior to screening out significant impacts (Defra background maps of annual mean may not accurately reflect the concentrations experienced at receptor locations).	Undertake detailed screening of construction rail emissions

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		(16) relate to passenger trains (DMU) which have much lower emissions than freight trains (ref. DfT webTAG guidance).		
		Table 5.8: The scope of the assessment for the operational phase considers aircraft movements on the new runway and taxiways. Appears not to consider reductions in emissions from the two existing runways, once the third runway is operational	Assessment of potential reduction in emissions from other runways, e.g. through reduced holding time may identify air quality benefit	Holistic assessment of operation of the three runways operating together.
		Table 5.8: The scope of the assessment for the operation phase includes combustion emissions of NO_2 and PM from both aircraft movements on the new runway and taxiways, as well as land based activities in support of airport operation. However, there may also be non-combustion emissions of PM from tyre wear, particularly from aircraft landings. Whilst emission factors are likely to be highly uncertain, given the focus on reduction to exposure to $PM_{2.5}$ within the 2018 Clean Air Strategy, the PEIR should consider this source / provide justification for scoping out.	Include consideration of non-combustion PM emissions from airport operations and aircraft (e.g. tyre wear from aircraft landings), with reference to objectives to reduce exposure to $PM_{2.5}$.	Consider non-combustion PM emissions from aircraft and airport operations
		<u>Assessment Method: Detailed Modelling</u>		
	Volume 1, Chapter 5 (Air Quality), Section 5.9 (Assessment Methodology), para 5.9.22 Volume 3, Appendix 5.1 (Detailed Modelling)	**Appendix 5.1, Section 1.1 Sources:** This appears only to consider operational phase sources. Detailed modelling should also be undertaken for the construction phase, given length of time and expected numbers of construction traffic movements (both HGVs and workers)/construction plant and NRMM.	Detailed air quality modelling of construction phase to fully assess impacts on sensitive receptors in a well defined and precautionary study area.	Include detailed air quality modelling for the construction phase where appropriate
		Appendix 5.1, Para 1.1.2: The recognition of uncertainty is welcome although it is unclear how or why the models will be validated. Use of a state of the art model that is approved for use by the Environment Agency / Defra, such as ADMS or AERMOD, would remove need to validate models. However, as set out in Appendix 5.1, Section 2.6, the model results should be verified	Proportionate approach to model validation and verification	Consider whether validation of the models themselves is necessary.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		through comparison with real world monitoring data, and adjusted where appropriate. Calculation of LTO emissions up to 1km height is considered appropriate for aircraft emissions with regard to impacts on local air quality. However there may be impacts on ecological sites through deposition of pollutants and justification of applying the same approach should be provided.	Consideration / justification required for deposition of nitrogen/acid to ecological receptors further afield once aircraft are beyond this area.	Consider need for assessment of aircraft emissions beyond 1km LTO cut off for ecological impacts
		App 5.2 **Para 2.3.2** – there is unlikely to be a single "worst case" meteorological year for all receptors under varying operational scenarios/ layout options/runway allocations. This may result in underreporting of findings. **Para 2.5.2, 2.7.6** – the primary NO2 emission from aircraft is likely to differ to those for road vehicles therefore application of PCM/LAQM approaches may not be suitable. Justification for applying these factors, including demonstrating they are conservative, should be provided in full. **Para 2.7.3** – Justification that the assumption that only direct deposition of NOx is relevant appears to be missing, can a reference be provided? Clarify if same exclusion of ammonia for road traffic is relevant to aircraft emissions. Even if released in smaller quantities, its relative contribution to N deposition is greater.		Concentrations should be presented for a variety of years Ensure appropriate NOx to NO2 conversion is applied A full explanation of the justification behind choices for approach to ecological assessment
	Volume 1, Chapter 5 (Air Quality),	**<u>Effect significance</u>** The approach for construction traffic is to use HE interim guidance[4] to assess the significance of	Given (i) the proximity to current and planned AQMAs, (ii) the proximity to areas of known Limit Value exceedance as	Use IAQM guidance on land use planning and development

[4] Highways England, Interim Advice Note 174/13 Evaluation of Significant Local Air Quality Effects, 2013

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
	Section 5.9 (Assessment Methodology), para 5.9.25-27 and Table 5.10	effects from changes in NO_2 and PM concentrations. This defines changes of less than or equal to 1% of the air quality threshold as 'imperceptible' (0.4 µg/m³ for NO_2 as an annual average). Conversely, IAQM guidance on land use planning and development control,[5] which is considered more appropriate for developments in urban areas, describes changes of less than 0.5% as negligible (0.2 µg/m³ NO_2 as an annual average). Use of DMRB guidance, may result in changes that are significant for local authorities to be missed.	modelled by Defra's PCM (see comments on the limitations of this national scale model), and as demonstrated by local monitoring, (iii) the magnitude of the proposed development and duration of the construction period, (iv) uncertainty of future baseline projections, (v) the range of uncertainty of the forecast impacts of the Surface Transport and Freight Strategies, it is recommended the study takes a precautionary approach and applies IAQM guidance significance criteria, particularly in areas within or adjacent to AQMAs, or where concentrations are approaching the air quality objectives.	control criteria to determine significance of effect, as a minimum in areas of existing/proposed AQMAs and other sensitive areas
		Definition of significance may need to be redefined in light of Defra's draft Clean Air Strategy which aims to reduce exposure to $PM_{2.5}$ and introduction of tighter standard. DMRB does not explicitly consider this pollutant.	Consideration of significance of $PM_{2.5}$ results with reference to exposure reduction will help identify appropriate mitigation.	Include consideration of $PM_{2.5}$ significance in context of exposure reduction
		<u>Guidance and Best Practice Documents</u>		
	Volume 3, Appendix 4.3 (Guidance and Best Practice Documents)	Relevant guidance for air quality also includes IAQM Guidance on land-use planning and development control, considered best practice methodology for land development in spatial planning. The DMRB is intended for application to major new road schemes. This IAQM guidance document on the other hand is applicable to assessing the effect of changes in exposure of members of the public resulting from residential and mixed-use developments, especially those within urban areas where air quality is poorer (and thus a smaller change in air quality may be more significant).	IAQM Guidance is best practice methodology for land development, and provides more sensitive assessment criteria for the identification of affected roads, as well as the significance of effects.	Use IAQM Guidance on land use planning and development control, as best practice methodology for land development, applicable to assessing the effect of changes of exposure, particularly within urban areas.
		Environment Agency (EA) online guidance for dispersion modelling of point sources should be referred to for sources such as power generating plant.	EA guidance is best practice for dispersion modelling of point source emissions	Use EA guidance for dispersion modelling of point sources

[5] EPUK & IAQM Land Use Planning & Development Control: Planning for Air Quality. January 2017.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		The reference in this table and in Appendix 5 1.2.1 to PSDH report on air quality is welcomed. Slough has developed a draft Low Emissions Strategy[6], which references Defra's emission damage cost approach to assess mitigation requirements. The London Plan (Policy 7.14) also includes the requirement that developments are 'air quality neutral', and require calculations of building and transport emissions. Inclusion of such an approach to mitigation for the Heathrow Expansion would be relevant, particularly in light of the wide area that may be affected by emissions and thus population exposed, including to $PM_{2.5.}$ The AQC air quality neutral guidance[7] recognises that major transport infrastructure development uses the DfT's webTAG methodology which includes economic valuation.	Inclusion of an emission damage cost methodology or equivalent, would provide a means of quantification and monetisation of emissions impacts, which could be used to inform the assessment of mitigation options (including on-site, off-site and financial contributions).	Assessment to be done in line with PSDH Include an emissions damage cost assessment or equivalent, for the construction and operation phases.
Alternative options	General	Ensure a Rochdale Envelope approach is applied to ensure the assessment of a reasonable worst case, i.e. a conservative and precautionary approach, where potential exists for the location/magnitude/temporal scope of emissions to change during the DCO process and once operational	Transparency in method and application of a Rochdale Envelope approach will allow for a comprehensive assessment and identification of mitigation measures, whilst retaining flexibility for amendments as the plans evolve.	Ensure an appropriate Rochdale Envelope approach is applied to ensure assessment of reasonable worst case
Cumulative effects	Volume 3, Appendix 3.1 (Cumulative effects)	The principle of the approach appears sound in relation to air quality effects: a. Scheme-wide effects = DCO with "other development" associated with airport expansion	-	-

[6] Slough Low Emission Strategy (LES) 2018-25 Draft. November 2017. Available online at: http://www.slough.gov.uk/downloads/LES_final_draft_23Nov.pdf

[7] Air Quality Consultants/Environ (2014) Air Quality Neutral Planning Support Update http://www.aqconsultants.co.uk/getattachment/Resources/Download-Reports/GLA-AQ-Neutral-Policy-Final-Report-April-2014.pdf.aspx

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		b. Effects of Scheme plus other development - under construction, permitted, submitted - in line with PINS advice note 17 c. In combination effects - e.g. noise, air quality and visual on health. The assessment scenarios (Appendix, Table 3.2) appear sound, covering both construction and operational impacts on existing and new receptors. A robust assessment year should be selected, ensuring a balance between likely improvements in air quality vs increase in emissions due to growth in land/air traffic The proposed use of strategic traffic model data should take into account growth as a result of development as set out in local plans. This should include plans for surrounding local authorities not just those within which the DCO boundary sits, as this may affect flows in wider area. Model adjustment may be necessary to also consider for other developments not included in local plans. Table 3.1.1 - the air quality study area for cumulative impacts cannot be commented upon at this stage. It should be noted the area presented in the scoping report is subject to change (but in our opinion, should be expanded), as is the case for noise.		
		Appendix A3.4 identifies 2079 cumulative developments. A proportionate approach to assessment would be welcome to ensure the assessment can be interpreted readily and the key impacts identified by stakeholders. This could incorporate an initial screening step undertaken to identify those with potential AQ Impacts.	HSPG should ensure ongoing consultation in the identification on relevant developments and on any approach to screening. Consideration should be given as to whether the Western Rail Link should be included as a Scheme Wide impact.	For cumulative developments where there is a high degree of uncertainty, apply precautionary principle and professional judgement in a qualitative assessment, if numerical data are not available to allow for modelling.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Scheme design	-	-	As a general measure, construction and operation should be planned so as to increase distance between source and receptor where practicable Potential to extend Ultra Low Emission Zone (ULEZ) to just inside the M25 boundary. Joint monitoring and review processes and action are required to monitor are quality targets and manage the improvement of air quality improvement and across the HSPG area impacted by expansion; HAL should be required to fund the air quality monitoring.	-
Mitigation	Volume 1, Chapter 5 (Air Quality), Section 5.10 (Approach to Mitigation)	**Mitigation: Construction** References to specific guidance and further detail on proposed mitigation measures should be included, e.g. dust, non-road mobile machinery (NRMM), construction vehicles (HGVs and LGVs) and construction worker movements	Mitigation measures for construction dust should reference guidance by the GLA and IAQM. A commitment to vehicle standards for NRMM, should follow GLA guidance and SPGs. Emissions performance of HGVs and LDVs used during construction should be Euro VI/6 or better. Emissions from concrete batching/crushing screening will be controlled by a local authority permit	Assessment should be iterative, so that due consideration is given to emissions from mitigation measures such as the use of rail/waterways
	Volume 1, Chapter 5 (Air Quality), Section 5.10 (Approach to Mitigation)	**Mitigation: Operation** It would be useful to include details of the methodology by which the impact on air quality emissions and concentrations of mitigation measures will be quantified. For example, whilst it is assumed that changes to traffic volumes resulting from Surface Traffic and Freight mitigation will be incorporated into traffic modelling (and therefore into the AQ model), there are no details regarding a methodology to quantify the impacts of emission reduction measures, i.e. incentivising / requiring use of low emission vehicles – both as part of airport operations, as well as public vehicles accessing the site (e.g. measures identified within the ANPS, para 5.10.11, emission-based vehicle charging para 5.10.16).	The air quality emissions and concentrations impacts of mitigation measures should be fully quantified, ideally including use of emission damage cost methodologies to inform whether additional mitigation (on-site, off-site or financial contributions) is required for either construction or operation phase emissions. Details of the methodology to be used set out in the PEIR.	Establish methods to be used to quantify mitigation impacts. Include an emissions damage cost assessment for the construction and operation phases.

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		The methodology proposed does not include reference to air quality neutral or emissions damage costs (ref. Policy 7.14 within the London Plan and Slough's draft Low Emissions Strategy). Inclusion of such an approach to mitigation for the Heathrow Expansion, for both construction and operation phases, is welcome, particularly in light of the wide area that may be affected and thus population exposed, in particular to $PM_{2.5}$.		
		Outline mitigation is provided at this stage and a more detailed mitigation strategy will be required for the EIA. The success of the air quality mitigation is dependent on the contents and delivery of separate documents (Surface Traffic Strategy, Freight Strategy and existing Heathrow Low Emissions Plan). The impacts of these strategies on air quality should be clearly established.	The following additional measures should be considered, many of which could be initiated at an early stage to improve local air quality, contribute to achieving legal compliance and help to offset both construction and operation emissions. - Investment in low emission bus fleet (i) servicing Heathrow; (ii) on other routes in surrounding areas as off-site / financial mitigation - Investment / funding to incentivise low emission taxis, for example provision of ULEV taxi ranks and supporting charging infrastructure at the airport, and surrounding rail hubs, supporting complete electric journeys from home to Heathrow. Note, there is a direct opportunity to work with Network Rail and develop Langley as an ultra-low emission hub, as Slough has already received £157k in OLEV funding for rapid charging facilities for plug-in taxis and the licensing committee is set to approve plans for all taxis to be ULEV by 2025. - Broader expansion of EV charging infrastructure, both within the airport and in the surrounding areas - Zero/low emission or electric vehicles as part of airport operations - Ringfencing of funds from emission-based access to support low emission measures within the local area	Consider broader measures to contribute to air quality improvement in surrounding areas. Maintain close communications with local authorities to maximise opportunities for a coordinated approach. HSPG should be kept informed of the development of mitigation options, and opportunities for a coordinated approach should be maximised.

Chapter 6 – Biodiversity				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 6	The desk study search area extends to 20km for international/European sites in relation to nitrogen deposition due to traffic. The HRA should also take into consideration SACs designated for bat species which can be highly mobile and range long distances. Effects of local or negligible significance are proposed to be scoped out. LNRs and Sites of Local Importance for Nature Conservation (SLINCs) could be argued to be of local importance and any loss of these sites is of local significance. However, these sites have been valued at higher than local importance (Borough or County) in the Scoping report. This avoids these sites being scoped out of further assessment. The report states that Species of Principle Importance (SPI) are generally considered to be Nationally important (para 6.9.9), but in Table 6.12 regularly occurring populations of SPI are considered to be of Regional importance. The Biodiversity Offsetting Strategy would take into account negative effects on ecological features of local importance, even though effects on these features is deemed to be not significant. There is a risk that, if locally significant effects are not included within the EIA, these effects could be relegated at later stages of scheme development in relation to biodiversity offsetting targets. The identification of likely effects does not include the effect of increased run-off from the new runway and hard surfaces into watercourses causing increased water flow and flooding events.	Full consideration should be taken of local development policies. The implementation of the Biodiversity Offsetting Strategy in full should ensure locally significant losses of habitat are taken into consideration in providing biodiversity net gain. However, the mechanism for how this would be delivered, if not an integral part of the EIA process, should be fully explained.	Effects on bat species in relation to SACs should be assessed under the HRA. Clarification of the value of Local sites (LNRs and SLINCs). Clarification of the value of populations of SPI. Clarification that biodiversity offsetting will take into account locally important habitats. Clarification that surface water run-off will be assessed in terms of volumes and flooding and the effects on biodiversity. A firm commitment to ensuring all effects of local or negligible significance are captured in the Biodiversity Offsetting strategy and the mechanisms for achieving this is not assessed in the EIA.
Cumulative effects	Volume 1, Chapter 6	Effects of local or negligible significance are proposed to be scoped out, without consideration of the cumulative effect of a number of locally significant effects.	Consideration should be made to the cumulative effect of a number of locally significant effects that could collectively be more significant.	Confirmation that the cumulative effect of a number of locally-significant effects will be taken into consideration.

Chapter 6 – Biodiversity				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Scheme design	Volume 1, Chapter 6	The outline scheme design provides large areas of new habitat. However, the detail of this habitat is outline at this stage and detailed calculations for the provision of offsetting for biodiversity net-gain is not set out in the Scoping report.	-	Provision of preliminary biodiversity net gain calculations.
Mitigation	Volume 1, Chapter 6	New habitats will require management in the long term (some e.g. meadow that are labour intensive). New habitats may be given over to local countryside organisations for future management which will require sufficient financial support. There is a risk that created habitats lose biodiversity value over time due to lack of management.	Consideration should be made of the ecosystem services provided by existing habitats loss and these services should be inherent in the new habitats provided.	Clarification required on how ecosystem services and long-term management of compensation sites are being taken into consideration.

Chapter 7 – Carbon and other Greenhouse Gases				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Sections 7.9.12 – 7.9.29	The positioning of the scope boundaries is important to the robustness of the study, as any exclusions or omissions will lead to an underestimated result. Further clarity on what specific items will be excluded and included in the study area is required. It is stated that the scope of the assessment will be decided by the amount of 'reasonable data or assumptions' available. Further detail should be provided, for each emission source, on the amount of data expected to be from actual project	Further detail required on what specific items will be included in and excluded from the study boundary, which parts of the calculation will be based on actual project data and which will be based on proxy data. Further detail required on the basis of assumptions (e.g. has a reasonable worst-case been selected). Details on the approach to quantify and present carbon offsetting/sequestration to be provided.	Further detail required on what specific items will be included in and excluded from the study boundary, which parts of the calculation will be based on actual project data and which will be based on proxy data. Further detail required on the basis of assumptions (e.g. has a reasonable worst-case been selected).

Chapter 7 – Carbon and other Greenhouse Gases				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		data, the amount that will be estimated p data, and what will be based on non-project-specific proxies. Any exclusions from the study should be clearly justified, and the effect of any assumptions on the accuracy of the result should be made. The assessment of operational emissions will use future projections, for example projected decarbonisation of the UK National Grid, and reduction in use of fossil-fuel powered vehicles. It is unclear how these future scenarios will be selected. Will a realistic worst-case be used? Over-estimation of UK electricity decarbonisation, for example, will lead to an under-estimation of operational emissions. Depending on the scenarios chosen, this may lead to significant inaccuracies in the study. The Scoping Report does not explain what the approach will be to quantifying and presenting carbon offsetting/sequestration as described in the Consultation Document.		Details on the approach to quantify and present carbon offsetting/sequestration to be provided.
	Volume 1, Sections 7.9.32 – 7.9.33	**Significance Assessment** The Scoping Report states that professional judgement will be used to determine whether emissions are significant, however it is not clear how this will be done in the absence of suitable best practice guidance. The IEMA guidance referenced in the report states that because GHG emissions will all contribute to climate change (the largest cumulative environmental effect and one that has a scientifically defined threshold) any GHG emissions might be considered significant.	-	Further detail required on how 'professional judgement' will be used to determine significance of emissions.

Chapter 7 – Carbon and other Greenhouse Gases				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Alternative options	Volume 1, Section Table 3.7	GHG emissions are scoped out for a number of items under the category 'airport supporting facilities'. It is not clear why this is the case, as there will be both construction and operation impacts for these components.	-	Clarification on reasons why airport supporting facilities have been scoped out of the GHG emission calculations.
Mitigation	Volume 1, Section 7.10	Very little detail on mitigation measures is provided. It is suggested that mitigation measures will meet the requirements in ANPS (5.77, 5.78 & 5.79) and will include design elements, construction approach and traffic management. Further detail on envisaged mitigation measures that directly address the different sources of emissions should be provided. A significant proportion of GHG mitigation measures are achieved at design stage, when decisions about the scale and nature of development and the materials that will be used are made. Further mitigation for the construction phase can come through the specification of construction approaches. Actual and potential mitigation measures presented at this stage would demonstrate that carbon reduction is being embedded into the design.	GHG mitigation measures are integral to the design – see opportunities above. Some detail on how mitigation is being integrated into the design process should be included in the EIA.	Further detailed information around specific mitigation measures that are planned. This might include choice of materials and how material quantities are being reduced, how the design of the scheme minimises emissions from the operational phase, and what construction approaches might be specified to reduce emissions.

Chapter 8 – Climate Change				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**

EIA Methodology	Volume 1, Chapter 8	The methodology seems appropriate and proportionate, and based on relevant policy and legislation. It has also been agreed with the Environment Agency, who will be consulted on an ongoing basis as the study develops. However, it should be noted that the Environment Agency only has responsibility to the Government for ensuring climate change adaptation in relation to water related aspects.	-	-
Alternative options	Volume 1, Table 3.7	Climate Change is scoped out of the options consideration for a number of items under the category 'airport supporting facilities'. It is not clear why this is the case, as the climate resilience of these elements will need to be considered.	Clarification on reasons why airport supporting facilities have been scoped out of the climate change assessment.	Further clarification on scoping out of airport supporting facilities to be provided.
Mitigation	Volume 1, Section 8.10.1 – 8.10.9	The Scoping Report does not specify mitigation measures, rather states that these will be developed by environmental topic leads and embedded through the EIA process. Any additional mitigation will be incorporated into the Climate Change Adaptation Plan. Effects of climate change on local communities and local resilience to climate change should be considered in the EIA.	Measures to reduce the impacts of climate change on the local area and improve local resilience should be considered as part of the package of mitigation measures.	Local measures to address climate change should be considered in the package of mitigation measures. HSPG to be consulted on the Climate Change Adaptation Plan.

Chapter 9 - Community				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 9	The method focuses heavily on recreational spaces and routes; there is very little information on how effects of other types of community facility will be assessed (e.g. schools, places of worship etc).	Set out the approach to assessing the effects of the project on community facilities such as schools etc. This will need to consider / set out the approach to assessing displacement, severance and viability of the facilities	Set out approach to assessing effects on other community facilities, as it stands the method is focused on recreational spaces and routes.

	Paragraph 9.3.6	Paragraph 9.3.6 states that user surveys will be drawn upon where published by LPAs and undertaken with regard to users of recreational facilities, spaces and routes. The onus should be on the applicant to undertake these and this should include a wider range of community facilities (e.g. indoor sports facilities etc).	Paragraph 9.3.6 – Include a user survey of other community facilities, not just recreational spaces and routes.	Ensure that the applicant fills the gaps in user survey data and doesn't rely on solely LPA user surveys, this should include other community facilities not just recreational spaces and routes. Clarify how the effects on community viability will be assessed with reference to the effect on population and demographics. Open space assessments are an important data source, and it is helpful the OSA is being prepared but local assessments of need should take precedence, with the OSA supplementing these. Existing open space and recreational facility deficiency maps are an important data source and where not available should be prepared. The applicant should be using data on the value and quality of recreational spaces to inform the assessment. Local workers should be included as a potential receptor. Improve the user survey data by collecting usage data for a wider selection of community facilities (i.e. built facilities).
	Volume 1, Section 9.6 and Table 9.4	Section 9.6 and Table 9.4 – Identifies baseline population & demographic information. However, it is not clear what the approach will be to assess the impact of the project on the population and demographic mix of the communities	Section 9.6 and Table 9.4 - Provide clarity on the approach to assessing the effect of the project on the baseline population and demographic conditions in each community and the impact this has on the viability of the community.	
	Volume 1, Table 9.3	Table 9.3 – Data Sources. Refers to studies from local authorities etc. The assumption is that local authority assessments will be used, however where these don't exist the Open Space Assessment (OSA) that is being carried out and is referred to in paragraph 9.9.10 should be used. Table 9.3 – open space and indoor recreation deficiency maps should be referred to as a specific data source in this table. Table 9.3 - The quality and value of the recreational space hasn't been referred to. This is important data that should be extracted and included in the assessment.	Table 9.3: - Ensure that local authority assessments are used as the starting point, to ensure data is based on local assessments of recreational need. - Include open space and indoor sport catchment / deficiency maps as a data source, and prepare these where they are not available. This will be important for understanding how the project impacts on existing deficiencies in open space and sports facility provision. - Inclusion of value and quality data, to ensure that there is a clear understanding of which are the best quality and highest valued recreational spaces.	
	Volume 1, Sections 9.6.9 - 10	Paragraph 9.6.9 - 10 and Table 9.5 – doesn't include workers at local businesses who could / are also likely to be users of recreational spaces and routes	Paragraphs 9.6.9 / 10 and Table 9.5 – to add local workers as a potential receptor.	

	Volume 1, Section 9.9.10 – bullet 7	Paragraph 9.9.10 (7) - Surveys of users of recreation facilities. There are some weaknesses with the proposed approach including: - The survey is exclusively assessing recreational routes and spaces, it would also be valuable to collect data on the use of indoor sports facilities and other community uses. - The paragraph doesn't specify what information about usage will be collected.	Paragraph 9.9.10 (7) - User survey data collection could be improved by: - Collecting usage information for a sample of other community facilities. - Strengthen user data, by collecting data on frequency of use of recreational space / route; distance travelled by user, mode of travel of user, whether the space / route is the primary space / route that the user visits (if not where is their primary space/ route and what others do they visit).	Strengthen user data by collecting detailed information such as frequency of use etc. The assessment should use recreational provision standards that have been either adopted by LPAs or defined through an assessment of local needs. The standards need to be for all types open space and include indoor sports. Sensitivity of receptors should be amended so that it is clear where users of non-park recreational spaces and indoor facilities would be placed in terms of magnitude
	Volume 1, Section 9.9.10 – bullet 8	Paragraph 9.9.10 (8) – States that the OSA will set common standards for provision of open space throughout the agreed study area. The starting point should be to use adopted local provision standards as defined / adopted by the LPAs for affected recreational spaces. It is not clear from the scoping report that the standards will be for all types of open space (i.e. allotments, natural and semi-natural greenspace etc.) not just parks.	Paragraph 9.9.10 (8) – Where LPA's recreational provision standards are missing/ unavailable, adopting standards would be appropriate (if based on an assessment of local needs). The standards used in the assessment should be for all types of open space (i.e. allotments, natural and semi-natural greenspace etc.) not just parks. Indoor sports standards should also be used / defined.	
	Volume 1, Table 9.9	Table 9.9 – refers sensitivity of receptors to change of recreation and amenity. There are weaknesses in the approach proposed including: - The approach refers to users of 'Regional' or 'Metropolitan' parks etc as a way of considering the sensitivity. This approach works for parks which tend to be defined by a set 'hierarchy' but there are issues with other open space types (including semi-natural green space, water bodies etc.), as it is not immediately clear how each recreation space would be categorised. - It's not clear how indoor recreation facilities will be accounted for in terms of sensitivity, as they are not referred to in this table.	Table 9.9 – improve the approach to sensitivity of receptors as follows: - Define or identify how users of non-park open space types will be classified into a 'hierarchy' based on their size and importance. - Identify how users of indoor recreation facilities will be classified into a hierarchy, based on their catchment.	Define or identify how users of non-park open space types will be classified into a 'hierarchy' based on their size and importance. Identify how users of indoor recreation facilities will be classified into a hierarchy, based on their catchment.
	Volume 3, Appendix 9.4-3 Proforma Attribute Table	Appendix 9.4-3 Proforma Attribute Table The information collected during the walk over survey of recreational spaces and routes has some weaknesses including:	Appendix 9.4-3 Proforma Attribute Table could be improved by: - Quality - Define / assess the quality of the recreational space, rather than whether they are 'fit for purpose'. - Value - Include the value of open space as an attribute to ensure highly valued spaces that	Amend the proforma to make improvements to the data collected in order to provide a clear understanding of the quality, value and role of the recreational spaces that could be affected by the project. This is important for ensuring any replacement land

		- Quality – this attribute appears to be based on whether the site is 'fit for purpose' rather than the quality of the site. - Value – The value of the recreational space is not considered. - Access does not consider how many points of entry the space has, sites with multiple access points will be widely accessible to their surrounding communities - Amenities – doesn't refer to car or cycle parking, which is important in understanding how the spaces are used. - Perceptual features – refers to noise, this shouldn't be considered a perceptual feature. - Physical attributes – it is not clear how sports facilities e.g. tennis courts etc within a park would be considered, these are recreational facilities in their own right but also part of the overall recreational offer of the park - Does the proforma pick up the full range of multi-functional roles that public spaces can play, for example are the spaces used by local schools as outdoor classrooms, or is the space used for events (e.g. fireworks, fairs etc).	might be affected by the proposals can be clearly identified. - Access - Should note the number of entry points / ease of entry under public accessibility attribute. - Amenities - Ensure amenities that would impact on the usage of the recreational spaces are identified. - Perceptual feature - Noise in recreational spaces should be considered / assessed using noise data, and shouldn't be considered a perceptual feature. - Physical attributes - Ensure sports facilities get picked up in proforma All the above are important in helping to understand the quality, value and role of the recreational spaces that could be affected by the project, and will be important in ensuring any replacement land proposed in secondary mitigation would be of equivalent or better provision.	proposed in secondary mitigation would be of equivalent or better provision than that displaced.
Adequacy of consideration of cumulative effects	Volume 1, Chapter 9, Section 9.4	Chapter 9 - No specific approach is identified for cumulative effects on community. Section 9.4 – although study areas are defined, it is not specifically stated that these would also be the Zone of Influence for assessing cumulative effects on community.	-	HSPG would like to see clearer evidence of how community effects will be integrated into the cumulative effects assessment.
Outline scheme design	Volume 1, Chapter 3, Section 3.3 ad Table 3.7	Section 3.3 and Table 3.7 – identify that only new cargo floorspace and car parking could be considered as relevant topics for community; the scoping report should clarify why other airport supporting facilities are not relevant to community.	Section 3.3 and Table 3.7 - Ensure that airport supporting facilities are not relevant for the community topic. For example, the utilities network, is referred to as being to the west of the airport, diversions to these networks could potentially affect the community (either temporary or permanent) and therefore shouldn't be scoped out as relevant to the topic at this stage. Consider whether land take for car parking, (in particular, off airport) and the level of parking overall could be reduced in order to minimise the impact on communities and community facilities. Particularly	Confirm that the airport supporting facilities that have been scoped out as not relevant for the community topic could not potentially affect the community (either temporary or permanent). Further detail on how the level of parking required in particular off airport has been calculated and whether this allows for scenarios for reduced levels of parking.

			given the potential for changes in technology that could result in a significant modal shift.	
Suitability and robustness of proposed mitigation measures (on site, off site and financial)	Volume 1, Section 9.10 – Approach to mitigation.	Section 9.10 - For community the embedded measures included are: - Property compensation package in the CPZ and voluntary package in the WPOZ - A commitment to set up a Heathrow Community Engagement Board - Commitment to Community Mitigation Fund For the property compensation package, the measure identified refers to residents; it's not clear whether this measure extends to business and in particular community facing businesses? The compensation package for the community is not clearly explained. The community mitigation fund is not clearly explained.	Explain how WPOZ and CPZ are defined and how the compensation package is calculated. Explain the community mitigation fund: what it will be used for and how the funds will be distributed. Consider whether there is an opportunity to phase development in a way that ensures communities are only displaced to minimise disruption and ensuring adequate facility provision prior to displacement. For communities surrounding the airport there are likely to be a range of 'secondary' mitigation measures that, as yet, are not identified in the scoping report and will be identified at the next stage. It will be important to ensure these secondary mitigation measures such as replacement community facilities and recreational amenities (both temporary and permanent replacement facilities) are identified.	Provide a more detailed explanation of the embedded measures such as the compensation package and community mitigation fund. Secondary mitigation measures will be important for the community topic which are not defined at this stage of the EIA.

Chapter 10 – Economics and Employment				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Adequacy of EIA Methodology	Volume 1, Chapter 10	The proposed methodology does not include analysis of the net additionality of socio-economic impacts. So for example, it would not capture what proportion of "new" jobs would really be new and would not be displaced from elsewhere. Or what proportion of these jobs would be taken up by local people and benefit local communities, rather than leak further away. The policy review makes no mention of the Government's Industrial Strategy.	-	The assessment needs to include analysis of the net additionality of socio-economic impacts. In addition to the economic multiplier effects already mentioned in the scoping chapter. This includes deadweight, leakage, substitution and displacement effects. This would provide a more robust assessment of the true socio-economic impacts of the scheme. The Industrial Strategy is the key national economic development document and the socio-economic assessment needs to show how the scheme aligns with it.

Adequacy of alternative options	Volume 1, Chapter 10	The scoping report states that a variety of scenarios will be used to assess the range of likely significant effects that could occur. This is an appropriate approach given the number of uncertainties at this provided that a more clearly defined approach to the Rochdale Envelope (see comments above) is adopted.	-	See comments above re Rochdale Envelope approach and clearly setting out parameters and flexibility for each scheme element and environmental topic assessment.
Adequacy of consideration of cumulative effects	Volume 1, Chapter 10	The socio-economic chapter provides no details of likely socio-economic cumulative effects. It refers to the generic cross-topic text provided in Chapter 4.	-	The assessment should indicate the nature of likely cumulative socio-economic impacts as well as the projects that should be considered as part of the cumulative assessment.
Suitability and robustness of proposed mitigation measures (on site, off site and financial)	Volume 1, Chapter 10	-	The scheme has the potential to deliver significant positive socio-economic effects. Therefore, alongside the consideration of mitigation actions for addressing adverse effects, measures to maximise these positive effects (e.g. appropriate complementary actions) should be explored in consultation with HSPG.	HSPG to be consulted on complementary actions which could help maximise the positive socio-economic effects of the scheme for local communities and businesses.

Chapter 11 - Historic Environment				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Section 4.2.12, Table 4.3 and Table 11.8 (page 11.25).	Historic environment section does not state that Table 4.3 will be used in conjunction with Table 11.8. The historic environment assessment needs to identify where significant positive or adverse effects are Major or Moderate, to identify the most beneficial and harmful effects.	-	Confirmation required that historic environment assessment will use both Table 4.3 and Table 11.8 in conjunction in the historic environment methodology.
	Volume 1, Section 11.4, Appendix 2, Fig. 11.1, Para 11.8	The Core Study Area boundary seems mostly realistic in relation to airport related development. However, it excludes the extent of the ZTV, which would be in the Wider Study Area. If a heritage asset is within a project's ZTV it is usually considered likely to be affected by both construction and operation, and the effects may be significant, depending on the nature of the asset and the change. 11.4.3 and 11.4.4 imply that in excluding the ZTV, the Core Study Area is	Using ZTV to identify heritage assets for inclusion in the baseline that may be subject to significant construction effects would allow for appropriate mitigation for setting effects beyond the Core Study Area.	ZTV should be used to establish heritage assets impacted by construction as well as operation. Significant operational effects relating to visual changes to the settings of heritage assets beyond the Core Study Area, within

		sufficiently 'holistic' to identify the heritage assets affected during construction, where tall cranes and temporary structures may be erected. This is a departure from usual practice. Para 11.8 also states that within the Wider Study Area (including, according to the definition of the wider Study Area, the area covered by the ZTV) operational effects will only be assessed in relation to noise and vibration and not in relation to visual impacts. As the ZTV is a by definition visual, it seems inappropriate to exclude visual effects within the ZTV in the methodology	This would also be the case with visual setting impacts within the ZTV beyond the Core Study Area (the methodology currently excludes these).	the ZTV should be included in the assessment.
	Volume 1, Table 4.6 Summary Scope of the Assessment and Chapter 11	Methodology in relation to Setting: Terminology/phrasing used is potentially misleading. Setting changes are material changes in planning terms as well as physical changes. Therefore, in Table 4.6, under Historic Environment 'material' should be changed to 'physical'. Similarly setting changes are referred to as 'perceptual' changes. Setting guidance and previous decisions demonstrate that setting can also relate to former associations and former spatial relationships. Although appreciation is an important element of setting, using the term 'perceptual' may potentially exclude some elements of setting.	Addressing all setting related issues, including spatial relationships, may help capture design opportunities to respond to former relationships better	Terminology changes should be adopted in the EIA.
	Volume 1, Section 11.9.31	Paragraph 11.9.31 states that setting assessment is subjective. Setting impacts are assessed on the basis of the impact on the contribution of setting to significance and on the ability to appreciate the significance. Identifying how setting contributes in these respects provides a robust baseline from which to assess impacts with supporting evidence.	Failure to provide a robust, proportionate and logically argued analysis of the contribution of setting to the significance and appreciation of the assets in terms of the criteria set out in the guidance would provide an inaccurate assessment, and potentially inappropriate mitigation/design responses.	HSPG question whether the setting assessment is, as suggested in the scoping report, subjective and request that criteria for assessing the contribution of setting to the significance and appreciation of the assets in terms of the criteria within the guidance are clearly set out and argued in the assessment.
Alternative options	Volume 1, Chapter 11, General and 11.10.2	Historic environment mitigation does not extend to building design, just landscape design, interpretation, archaeology etc.	There may be opportunities for design of structures and layout, to respond to and reference historic environment significance. Especially the case with structures of airport	HSPG would expect to see enhancement through design references to heritage assets and building design and layout responses. Design should better reveal the significance

			related development and supporting facilities.	of heritage assets and respond positively to historic character.
Scheme design	Volume 1 and Figures	Form, massing, extent and/or exact location of car parking and airport related development is outline and could potentially significantly impact nearby heritage assets. This is also the case with potential impacts to Colnbrook heritage assets/historic character from more offline A4 diversions south of the A4 and from river diversions from Assembly Option 1. Parameters of options around Stanwell also have potential to impact its heritage assets.	Design and sensitive siting of these elements have the potential to preserve, enhance or harm significance, and it is vital that design of these elements responds to the specific nature of the heritage assets' character and significance, rather than being standardised. Interpretation of history and archaeology should be through building and public realm design and public art, as well as being through more conventional interpretative display and outreach programmes, etc.	HSPG would expect to see responsive nonstandard, detailed design around historic village cores and in areas where historic character survives, to enhance it and the sense of place and historic environment interpretation including public art, building and public realm design.
	General	The settings of any surviving areas of Harmondsworth village core would be significantly affected by the proximity of the runway. The design of structures and landscape beyond the north edge of the proposed airport boundary is vital to maintaining the significance of the village core.	Design should aim to robustly protect significance where large scale new development is immediately adjacent to village cores.	The design should aim to robustly protect significance where large scale new development is immediately adjacent to village cores.
Mitigation	-	-	Colnbrook village conservation area enhancement package – building upon the heritage mitigation scheme to achieve wider objectives to achieve rounded package of traffic management, environmental and social economic compensatory and mitigation actions. Similar will be appropriate in other local communities. HSPG seek not only mitigation but enhancement of this area, it is already prone to cumulative development pressures.	-

Chapter 12 - Health				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Summary scope of the assessment	Volume 1, Executive Summary, p. iv and Chapter 3 The DCO Report, p.3.15	No rationale provided as to why Rivers and Flood storage, operation phase has been scoped out, only construction phase is assessed.	Given climate change it is precautionary to make some assessment of implications of flooding during operational phase.	Ensure inclusion of Rivers and Flood storage in the health assessment of the operational phase to ensure that flooding issues take account of climate change and local communities as well as future developments around Heathrow over the next 20-50 years.
Policy context	Volume 1, 1. Introduction, p.1.14	Only Section 4 of the revised draft ANPS is mentioned. This section, like Chapter 12 Health, should also mention the paragraph in Section 1 and this specific point. The ANPS, June 2018, has this in Section 4 but also in Section 1, p. 11 states "The application should include and propose health mitigation, which seeks to maximise the health benefits of the scheme and mitigate any negative health impacts."	This sets out a clear strategic principle for the scheme that aligns with HSPG. This point is mentioned in the Health chapter but needs to be upfront as well.	There should be explicit mention of Section 1 and this particular sentence in the policy context.
Airport supporting facilities	Volume 1, 1. Introduction, p.3.17	Unclear why aviation fuel storage facilities have been scoped out from the community health assessment	There is potential for leaks as well as unforeseen events where the location of the aviation fuel storage could have adverse implications for local communities	Aviation fuel storage facilities should be considered as part of the health assessment.
Approach to assessment of impacts from waste (Table 4.5)	Volume 1, 4. Approach to EIA scoping, p.4.14, row on Environmental Impacts of New Waste Management Facilities	In the column on 'Key considerations raised by the revised draft ANPS', nothing is stated.	The ANPS (June 2018) gives a clear steer on the broad scope that should be used to assess community health and so key statements from the ANPS should be stated here.	This section should refer to para 1.37 of ANPS (June 2018) "The application should include and propose health mitigation, which seeks to maximise the health benefits of the scheme and mitigate any negative health impacts." And para 4.73 of ANPS (June 2018) "The applicant should identify measures to avoid, reduce or compensate for adverse health impacts as appropriate. These impacts may affect people simultaneously, so the applicant, the Examining Authority and the Secretary of State (in determining an application for development consent) should consider the cumulative impact on health."
Summary scope of assessment (Table 4.6)	Volume 1, 4. Approach to EIA scoping, p.4.18, row on Air Quality	For both construction and operation, there is no mention of in-combination or cumulative air quality related health impacts i.e. baseline (existing aircraft and roads) plus scheme construction plus other development in the neighbouring areas.	This is a key inconsistency in the document, it is mentioned (again inconsistently) in the Health chapter	Explicit mention for both construction and operation, of in-combination or cumulative air quality related health impacts

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Summary scope of assessment (Table 4.6)	Volume 1, 4. Approach to EIA scoping, p.4.22, row on Climate Change	Only health and safety impacts of extreme weather/climatic events during the construction phase are considered.	There are likely to health and safety impacts on visitors and users of the airport in extreme weather/climatic events and possibly local communities as well during the operational phase	This needs to be assessed in more detail before being scoped out.
Summary scope of assessment (Table 4.6)	Volume 1, 4. Approach to EIA scoping, p.4.25, row on Health	No mention that impacts will be separated out into local and wider community beneficial impacts to recognise the differential and unequal (inequitable) impacts on local people compared to those living further away (those living further will mostly/wholly experience the positive impacts). <u>Living conditions: Construction and Operation</u> No mention of impact on local house prices during both construction and operational phases. No mention of potential difficulties in selling homes during construction and early operational phases. Living conditions should remain a theme for the operation phase. Its removal shows that this theme is only about relocation of some residents and hence not about local living conditions but simply about resettlement. <u>Safety: Construction and operation</u> This should be part of both construction and operation not just operation. <u>Assessment of key health outcomes</u> There is no mention of assessing the effects on four of the five main health outcomes of any scheme – non-communicable disease (heart disease, respiratory disease), mental health and wellbeing, injury and nutritional disorders (obesity) [communicable disease - in the UK context - is only relevant in terms of global epidemics e.g. SARS]. Mental health and wellbeing should be the term used not just wellbeing, which is too broad and as defined in the scoping	This is about protecting community health and making a full and well considered assessment of health impacts. It is important that the health assessment recognise and assess effects with the understanding that the adverse impacts and beneficial impacts fall on different groups of people. They cannot be summed. The themes under Environment should be under Living Conditions and the theme Environment should be removed. This would more logical and connect up key in-combination impacts and associated health effects. There needs to be a stronger focus on health outcomes as this is lost in the generic themes that will be used to assess health impacts.	An explicit statement should be added in the health assessment to clarify the fact that in general negative impacts are likely to be experienced by local residents and the positive benefits likely to be experienced by people living further away using or being employed in the airport. Review of determinants/themes used to make them more consistent and more aligned to community concerns and needs. The health assessment should consider the health and wellbeing impacts of: - Changes in local house prices during both construction and operational phases. - Difficulties in selling homes during construction and early operational phases. Safety issues should be considered as part of both construction and operation. There should be explicit mention that the health assessment will consider the key health outcomes: non-communicable disease (heart disease, respiratory disease), mental health and wellbeing, injury and nutritional disorders (obesity). Mental health and wellbeing should be the term used not just wellbeing which is too broad and as defined in the scoping report is decoupled from the fact that adverse effects

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		report is decoupled from the fact that adverse effects on wellbeing can lead to mental health/ill health effects. Receptors Users of the airport Airport staff/ People who work in the airport (this is the bigger group to benefit and most of these will not be local residents) Visitors to the local area Open, green and play spaces		on wellbeing can lead to mental health/ill health effects. The following receptors should be included: Receptors Users of the airport Airport staff/ People who work in the airport (this is the bigger group to benefit and most of these will not be local residents) Visitors to the local area Open, green and play spaces
Summary scope of assessment (Table 4.6)	Volume 1, 4. Approach to EIA scoping, p.4.27, row on Land Quality	No mention of in-combination and cumulative impacts on health.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Explicit mention of in-combination and cumulative health impacts.
Summary scope of assessment (Table 4.6)	Volume 1, 4. Approach to EIA scoping, p. 4.28, row on Major Accidents and Disasters	Accident and disaster plans for the airport need to be updated to include the construction and operational phases as part of mitigation proposals.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Explicit mention that accident and disaster plan for the airport will be updated to include the construction and operation phases as part of mitigation proposals.
In-combination effects	Volume 1, Approach to EIA scoping, p.4.37-4.37, 4.7 In-combination effects	Paragraph 4.7.1 defines in-combination effects narrowly as effects on a single receptor at one point in time, however this does not take into account in-combination effects over long periods of time. Paragraph 4.7.2 states that impacts are rarely additive. From a public health perspective in-combination health effects are either additive or synergistic (in most situations). Some health effects can be quantified using recognised UK or international methodologies e.g. air pollution and noise. Therefore, it is unclear what is meant by “a collection of impacts need to be drawn together in a meaningful way”	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts. The definition for in-combination effects should be “the combined environmental impacts/effects from the DCO project on a single receptor at a single point in time or over a period of time”. This would ensure that the assessment of in-combination impacts/effects took account of single point, intermittent predictable, intermittent	Recommend changing definition to be broader so a more holistic analysis of in-combination impacts can be undertaken. Ensure that the scope allows HSPG to request that the modelled changes in air quality and noise be quantified into estimated changes in key health outcomes if needed.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
			unpredictable and continuous effects (short, medium and long term. Where necessary HSPG should ensure that if required the EIA undertakes quantification. This is likely only to be useful in specific cases e.g. effects on a school. This is because there is some evidence that indoor air in schools is worse than local outdoor air pollution. See, Indoor air quality in London's schools report.	
Air quality and odour	Volume 1, 5. Air quality and odour, p.5.27-5.28, Table 5.8 Likely significant air quality and odour effects	No mention of potential health effects on people (especially children) using open, green and play spaces. No mention of sensitive receptors such as the elderly, those with existing respiratory conditions and young children (it is mentioned in the Health chapter).	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Explicit mention of potential effects on people (especially children) using open, green and play spaces. Explicit mention of sensitive receptors such as the elderly, those with existing respiratory conditions and young children.
Climate change	Volume 1, 8. Climate change, p.8.15 Table 8.3 Likely significant climate change effects	Extreme weather events are only considered for the construction phase and not the operation phase. They should be considered for both. The potential health impacts of these events would be on local communities, airport staff, users of the airport, and visitors to the local area. Not sure why 'Changes in seasonal patterns of rainfall, temperature and wind resulting in changes in air quality exacerbating health and safety impacts' is only in the operation phase. It would also apply to the construction phase.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Recommend that extreme weather events are considered for both the construction phase and operation phase. Ensure that the full range of receptors is considered: local communities, airport staff, users of the airport, and visitors to the local area. Changes in seasonal patterns of rainfall, temperature and wind resulting in changes in air quality exacerbating health and safety impacts also applies to the construction phase

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Climate change	Volume 1, 8. Climate change, p.8.20, Construction and operation assessment methodology	Paragraph 8.9.11 should also include the WHO report, Promoting health while mitigating climate change.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriate analysis the community health impacts.	Request that Paragraph 8.9.11 should also include the WHO report, Promoting health while mitigating climate change
Health Likely significant health effects	Volume 1, 12. Health, p.12.16-12.17, Table 12.3 Likely significant health effects	As mentioned earlier in the comment on the summary of the scope: No mention of the fact that impacts will be separated out into local and wider community beneficial impacts to recognise the differential and unequal (inequitable) impacts on local people compared to those living further away (those living further will mostly/wholly experience the positive impacts). Living conditions: Construction and Operation No mention of health impact of changes in local house prices during both construction and operation phases. No mention of the health impact of potential difficulties in selling homes during construction and early operation phases. The environmental theme is better seen as living conditions. Currently, Living Conditions theme is really about Resettlement. Safety: Construction and operation This should be part of both construction and operation not just operation. Assessment of key health outcomes There is no mention of assessing the effects on four of the five main health outcomes of any scheme – non-communicable disease (heart disease, respiratory disease), mental health and wellbeing, injury and nutritional disorders (obesity) [communicable disease - in the UK context - is only relevant in terms of global epidemics e.g. SARS].	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	As stated previously, an explicit statement should be added in the Health assessment to clarify the fact that in general negative impacts are likely to be experienced by local residents and the positive benefits likely to be experienced by people living further away using or being employed in the airport. Undertake a review of determinants/themes used to make them more consistent and more aligned to community concerns and needs. The health assessment should consider the health and wellbeing impacts of: - Changes in local house prices during both construction and operational phases. - Difficulties in selling homes during construction and early operational phases. Safety issues should be considered as part of both construction and operation. There should be explicit mention of the fact that the health assessment will consider the key health outcomes: non-communicable disease (heart disease, respiratory disease), mental health and wellbeing, injury and nutritional disorders (obesity). Mental health and wellbeing should be the term used not just wellbeing which is too

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		The human set of receptors is mentioned in 12.9.24, p. 12.23 but not elsewhere: "The general population scope of the health assessment considers: residents of and visitors to local communities (in the inner and wider study areas); the workforce and passengers of Heathrow (current and future); and construction workers for the DCO Project. However, the focus is on community effects." <u>Receptors</u> Users of the airport Airport staff/ People who work in the airport (this is the bigger group to benefit and most of these will not be local residents) Visitors to the local area Open, green and play spaces		broad and as defined in the scoping report is decoupled from the fact that adverse effects on wellbeing can lead to mental health/ill health effects. The following receptors should be included: <u>Receptors</u> Users of the airport Airport staff/ People who work in the airport (this is the bigger group to benefit and most of these will not be local residents) Visitors to the local area Open, green and play spaces
Health Health impacts and mitigation of health impacts of flooding	Volume 1, 12. Health, p.12.18, Paragraphs 12.8.3 and 12.9.20	Taking a precautionary approach, flooding (assessment and mitigation) should be part of the assessments; as with climate change, potential flooding would create a public health emergency in the area and Heathrow would be an important stakeholder in supporting the management of any local flooding. Flood risk management plan and how Heathrow will link in with other emergency services, especially health services, should be part of the mitigation. A public health perspective is needed alongside the review by the Environment Agency. This should be provided by the HIA team and/or Public Health England as the appropriate statutory agency working at the same level as the Environment Agency.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Recommend that flooding (assessment and mitigation) should be part of the assessments; as with climate change, potential flooding would create a public health emergency in the area and Heathrow would be an important stakeholder in supporting the management of any local flooding. Flood risk management plan detailing how Heathrow will link in with other emergency services, especially health services, should be part of the mitigation. A public health perspective is needed alongside the review by the Environment Agency. This should be provided by the HIA team and/or Public Health England as the appropriate statutory agency working at the same level as the Environment Agency.
Health Transparency in assessing complex impacts	Volume 1, 12. Health, p.12.19, Paragraph 12.9.5	The health assessment will need to assess individual components of the development and then develop a combined assessment of significance. For transparency of these individual components of the DCO will need to be assessed separately e.g. using a health impact table/matrix.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	The health assessment will need to assess individual components and then develop a combined assessment of significance. For transparency of the assessment key individual components of the DCO will need to be assessed separately e.g. using a health impact table/matrix.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Health How other assessment findings link into the health assessment	Volume 1, 12. Health, p.12.20, Paragraph 12.9.9	Unclear what is meant by “applied in the health assessment”, it should be informed by as the health assessment taking the findings of these assessments into account may judge that some aspects are significant even if these other assessments do not judge them significant.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriate analysis the community health impacts.	Clarify what is meant in this paragraph. The other specialist assessment should inform the health assessment and should not be applied without reflection and critical review into the health assessment.
Health Uncertainty of health pathway relationships and impacts	Volume 1, 12. Health, p.12.22, Paragraph 12.9.16	Unclear where the uncertainty lies; Is it an uncertain relationship between a project activity and heath outcome, and hence uncertainty of the possibility or likelihood of the health impact? Adopting a precautionary approach to the assessment will help address uncertainty.	This is about protecting community health and ensuring the health assessment is holistic, and fully and appropriately analyses the community health impacts.	Clarify what is meant in this paragraph.
Health Precautionary approach	Volume 1, 12. Health, p.12.23, Paragraph 12.9.18	The assessment is either precautionary or it is not (i.e. pragmatic in this context implies non-precautionary). It cannot be both. It is strongly recommended that the approach is precautionary. The second part of this paragraph, is an obvious point and it is unclear why it is made here.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	The scoping report and EIA must take precautionary approach that is consistently applied across the whole scoping report and EIA.
Health Assessing significance	Volume 1, 12. Health, p.12.23, Paragraph 12.9.21	The full analysis of the health impacts should consider impacts that are moderate and then analyse whether these have the potential for significant in-combination or cumulative impacts/effects. Similarly, potential cumulative impacts linked to other projects in the locality need to be considered?	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	The health assessment must consider, and not scope out, health impacts that are moderate. These moderate impacts must be discussed in the environmental statement and then analysed in terms of whether these have significant in-combination or cumulative impacts/effects. The health assessment must consider the cumulative impacts linked to other projects that are likely to occur in the locality.
Health Population scope	Volume 1, 12. Health, p.12.23, Paragraph 12.9.24	The meaning of the statement specifying the focus will be on “community effects” is not clear. Does this mean the assessment is not holistically considering all human receptors and will narrowly focus on immediate local residents?	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Clarification on what is meant by a focus on community effects. The whole focus of the health assessment is on the community.
Health	Volume 1, 12. Health, p.12.24,	What about reporting of cumulative impacts?	This is about protecting community health and ensuring the health	Both in-combination and cumulative impacts should also be considered in the health

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
In-combination effects and cumulative effects	Paragraph 12.9.27	These should also be considered in the Health assessment and presented in brief in the health chapter. This is mentioned in 12.9.7 but not mentioned in 12.9.27	assessment is holistic and fully and appropriately analyses the community health impacts.	assessment and presented in brief in the health chapter (and in detail in the separate cumulative assessment chapter).
Health Exposure-response relationships	Volume 1, 12. Health, p.12.25, Paragraph 12.9.30	This is not an accurate statement. Exposure-function is a typo it seems. Exposure-response functions (relationships) for quantifying health impacts can be used when there is expert consensus (WHO) and sufficiently strong evidence from rigorous studies. The issue of chance, bias and confounding applies only to the studies that inform the expert consensus. There is DEFRA guidance on noise quantification.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Paragraph should be amended so it is scientifically accurate and include the fact that DEFRA has developed guidance on noise quantification.
Health Quantitative analysis	Volume 1, 12. Health, p.12.25, Paragraph 12.9.31 and Table 12.5	Does this mean that the health assessment will use the quantitative modelling findings to inform the health assessments qualitative judgment of impact and significance? Or does this mean that a quantitative analysis of the health outcomes will also be undertaken using exposure? The air quality and noise chapters do not discuss quantifying health outcomes. The Air Quality and Noise Expert Groups should inform the health assessment on this aspect.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Ensure that HSPG can request a quantification of the health outcomes of modelled changes in air quality and noise, if deemed appropriate, particularly for sensitive receptors like schools.
Health	Volume 1, 12. Health, p.12.26-28, Table 12.6	These rows should be linked to physical health outcomes as well as mental health and wellbeing: Relocation as a minimum should be linked to mental health and wellbeing. The effects of noise and air quality on cardiovascular and respiratory health (as with changes in local traffic in Lifestyle row, there is no threshold effect for air quality and for aircraft noise on learning and cognition) should be examined. Employment is linked to cardiovascular health.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	The Living conditions, Environment and Economy rows should mention both physical health outcomes and mental health and wellbeing

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		Given a precautionary approach and that there is reasonable evidence of a health pathway, physical as well as mental health and wellbeing effects should be considered in the health assessment.		
Health	Volume 1, 12. Health, p.12.29, Paragraph 12.9.1	The assessment should use a matrix approach to analyse the nine criteria (ticks and crosses) to be transparent about the qualitative professional judgment used for each category to determine significance of impacts. Non-significant moderate impacts should be reported. Particularly as Paragraph 12.10.3 states that: "The application of mitigation measures will not be limited to health effects that have been identified as being 'significant'."	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	There should be an explicit analysis of the nine dimensions used to determinant level of impact.
Health Criteria for scientific evidence set too high	Volume 1, 12. Health, p.12.30, Table 12.7	Given a precautionary approach, the bar for scientific evidence is being set too high. How is sufficient defined and decided? Who decides this? The threshold should be based on the balance of probabilities i.e. is there a reasonable chance for the health effect to be experienced by a given population?	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts. The methodology sets a high scientific bar for what can be considered a likely health impact, that goes against the stated precautionary approach taken by in the scoping report and health assessment.	This paragraph should be re-worded to say: "Is there a plausible health pathway, outcome or determinants with some good quality scientific evidence to support the link between……?"
Health Approach to determining significance	Volume 1, 12. Health, p.12.30, Paragraph 12.9.3	This paragraph should add that a precautionary approach will be used to judge significance.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	This paragraph should also say explicitly that a precautionary approach will be used to judge significance.
Health Reporting of moderate impacts not just major impacts	Volume 1, 12. Health, p.12.32, Paragraph 12.9.4	HIA good practice advocates transparency of judgment for stakeholders so that the number and range of moderate impacts are clear; all moderate impacts should be reported. Discretion and professional judgment will need to be used as some moderate impacts could be deemed significant.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyse the community health impacts.	Moderate impacts should also be discussed alongside major impacts in the health assessment chapter and HIA report appendix.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		As stated previously in-combination moderate impacts can lead to a significant impact. This is not considered in this assessment criteria checklist.		
Health Mitigation proposals	Volume 1, 12. Health, p.12.34, Paragraph 12.10.5	The proposals are very general: There is no mention of: - protecting and enhancing open, green and play spaces, - protecting and enhancing social capital and cohesion - identifying those worse affected/vulnerable and providing additional support for them - working with local communities to deal with complaints and grievances over the construction and operation phases - supporting local schools with educational, training and employment opportunities	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Include the following broad proposals: - protecting and enhancing open, green and play spaces, - protecting and enhancing social capital and cohesion - identifying those worse affected/vulnerable and providing additional support for them - working with local communities to deal with complaints and grievances over the construction and operation phases - supporting local schools with educational, training and employment opportunities
Health Population and human health	Volume 1, 15. Major accidents and disasters, p.15.11, table 15.4	The row Population and Human Health should include Chapter 12: Health	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	The row Population and Human Health should include Chapter 12: Health
Community Appendix 9.2	Volume 3, pdf pages 969-979 Index of multiple deprivation	These are useful high level maps. However, there is a need for more zoomed in maps and identification of the wards where 10% and 20% most deprived areas are located, to better inform the health assessment and its analysis of inequalities and inequity.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Zoomed in deprivation maps and identification of the wards where the 10% and 20% most deprived areas are located would be useful to better inform the health assessment and its analysis of inequalities and inequity.

Chapter 13 - Landscape and visual amenity				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Adequacy of EIA Methodology	Volume 1, Chapter 13 Appendices and Figures for Chapter 13.	**Scoping Report:** Reference is made to current guidance, relating to and Landscape and Visual Effects Assessment guidance (IAN 135/10). Note recent changes to this guidance. **Appendices:** There is no background or baseline information relating to landscape in the Appendices. Given that baseline work and field study has been initiated in 2017, it would be useful to see this early work recorded, noting of course there will be a need to return and review the study as the schemes become more progressed. A Landscape Constraints Plan provides a preliminary ZTV, representative viewpoints and designations but does not yet illustrate local Landscape Character, or Protected view corridors.	There are many strands that are cross cutting and this project gives a unique opportunity to review the landscape issues across a series of authorities. Identifying criteria for design exploration could include the following: • London Green Grid • General plan of localised published landscape character variation. • Vegetation and open space lost and quantified in terms of areas within the DCP scheme area. • Areas in need of management of distinctly similar themes, e.g., land requiring remediation or in a degraded/despoiled condition or character; essentially these are future opportunity areas.	Integrate additional considerations into the design including London Green Grid, landscape character variations, vegetated and open space areas ad land requiring remediation. Provision of a GIS baseline that provides a mapped series of assets across all the HSPG boroughs.
Landscape Characterisation	Volume 1, Chapter 13	The report identifies and quotes extracts from the National Character Area, NCA 115, Thames Valley, but does not to set out the local borough character mapping, which would be expected at the assessment stage.	Develop a full plan of the local published character areas, highlighting where the opportunities exist for management especially in areas of lesser quality or urban/degraded landscape, as a tool to identify off-site improvements.	HSPG to be consulted on these issues during PEIR review period.
Viewpoints	Volume 1, Chapter 13	The viewpoints are still to be finalised and agreed with Borough Landscape Officers. The land to the west of London is generally flat and the responses from Colne Valley Regional Park highlight this and the concerns for visibility. Once agreed, 'existing' and 'after' views along a suitable timeline (e.g. Years 0, 1 and 15), with consideration of the changes between winter and summer, need to be set out in the method, perhaps highlighting where these are going to be of greatest interest.	Review the Harmondsworth View to consider views the open space, Harmondsworth Moor and settlement areas, to ensure the loss of viewpoints is noted, as well as change in views. Viewpoints within the CVRP are set out in 'All London Green Grid: 10, River Colne and Crane Area Framework; note that	Confirmation of viewpoint agreement with the Boroughs Landscape Officers, a composite plan and requirements for visualisation to be explored to achieve a pragmatic set of representative viewpoints. Develop and share a 3D model for visualisation of the scheme, to be developed to assist in conveying the proposals, and as

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
			one of these views would be lost to the proposals. The proposal needs to provide new potential viewpoints (which are recreational and related to design of new spaces as part of a visual framework for the masterplan.)	a cost-effective means of reviewing views from different receptor viewpoints.
Protected Views	Volume 1, Chapter 13	No reference to any protected view corridors, which should be highlighted or excluded. The 87m tower will be visible from parts of outer London and elevated viewpoints within the nearby boroughs. This will similarly be an issue from Windsor and Slough's elevated viewpoints, e.g. viewpoints No. 17, 20 and 23.	Review the Richmond Planning sources and the King Henry's Mound Viewing Platform. This is a protected viewing point towards St. Paul's in London, but views west are noted towards both Windsor Castle / Albert Bridge and Heathrow, part of which would include the new 87m tower.	Review views westwards from selected high points in outer London (Richmond Policy DMHD7) and protected views or views within and surrounding Windsor.
Alternative options .	Volume 1, Chapter 13, Section 3.10.2	Reference is made to the different options and the requirements in relation to construction and operation landscape and visual measures, but they are not specific yet.	There is potential to consider a tabular alterative layout to give an indication of the potential landscape and visual effects, perhaps to assist in determining the greater spread of visibility of one option. Consider the potential for off-site enhancement to add value as renewed landscape infrastructure in areas of degraded landscape, as well as providing visual amelioration.	Review the options in terms of loss of landscape elements and quality/value.
Scheme design	Figure1.2, Annex B of the revised draft ANPS.	Loss of assets to the north and south - including open space, landscape components, severance of PRoW - their function and uses and value to the wider neighbourhoods of Harmondsworth, Sipson to the north and Stanwell to the south-west. For these it is not clear where re-provision of open space will be located and if it provides the same accessibility and amenity to the neighbourhoods it formerly served. The same principle would apply to lakes or water features as landscape components, although this is possibly covered elsewhere. Upstream flood compensation areas need to be	There is no obvious re-provision of open space or landscape components to the south-west at Stanwell, this needs to be addressed. Understanding the rationale for the re-provision of all types of open space and parkland to meet need in terms of accessibility.	Provide a strategy which sets out the equivalency of open space and a rationale for its location to demonstrate that the land for open space is on an 'equally advantageous' basis (as embedded in the DCO land acquisition process) with clear criteria for why it is acceptable.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		included in the masterplan and their capacity for providing other habitat or open space roles explored. Areas in need of management of distinctly similar themes, e.g., land requiring remediation or in a degraded/despoiled condition. The masterplan needs to embed the ecological measures, which will emerge as the assessments are completed.		

Chapter 14 – Land quality				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1 Chapter 14, Volume 3 Appendix 14.1	Proposed methodology for assessing land quality issues is fully compliant with current guidance and industry best practice. Land quality has been included in the EIA scope for all construction aspects and most operational aspects. It has been excluded from the operational stages of road construction and public transport which is considered to be appropriate. Scoping report has been based on a conventional desk study which has been undertaken in accordance with relevant published guidance and industry best practice.	There is opportunity for a number of local contaminated sites to be remediated, including multiple dilute and disperse landfills, as part of the airport expansion. HSPG would like to see remediation of these sites incorporated into the mitigation package.	Integration of landfill remediation into the mitigation package for the scheme including commitments to specific sites.
Alternative options	Volume 1, Chapter 14	The proposed scope of the assessment considers all land within the DCO boundary plus a 500m buffer which is considered to be appropriate.	-	The spatial coverage of the land quality section is considered sufficient to encompass all appropriate alternative options.

Mitigation	Volume 1, Chapter 14	Proposed approach to development of mitigation measures is considered to be appropriate and consistent with relevant published guidance e.g. CLR 11.	-	-

Chapter 15 – Major accidents and disasters				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 15, Appendix 15.5	HSPG are generally satisfied with the approach to assessment of Major Accidents and Disasters, including the types of incident to be included and excluded within the assessment which seems reasonable and logical.	At PEIR stage it would be expected to see an indication of the receptors which could potentially be affected by each potential type of incident.	At PEIR stage it would be expected to see an indication of the receptors which could potentially be affected by each potential type of incident

Chapter 16 – Noise and vibration				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 16	The methodology describes 8 different assessment years, but it is not clear which comparisons will be made to consider all of the effects. Certain comparisons could give rise to more/less adverse impacts. Two different aircraft noise calculation methodologies are noted, but it is not clear why two are needed. For non-residential receptors it is stated that annoyance would be assessed for operational noise. For construction noise disruption of function/cognitive impairment is also assessed – this also needs to be assessed for operational noise.	The EIA methodology indicates that study areas would be expanded where it is clear that LOAEL is exceeded at the currently expected study areas. This could be an opportunity to ensure that impacts are picked up in wider areas. It is proposed that the L_{Amax} parameter is also considered for night-time construction works to protect against sleep disturbance. It was not clear that the engine testing facility will be included in	In general, the assessment methodology and criteria are considered appropriate, but clarification required on the issues raised here to ensure a robust methodology is adopted.

		The assumptions on future flight paths may be key in determining if operational impacts are significant or not. The LOAEL and SOAEL Table 16.7 currently includes a non-specific maximum criterion for aircraft noise "L_{Amax}/number of events and a risk assessment of objective sleep disturbance". An appropriate L_{Amax} value should be inserted to ensure the is not ambiguous.	"maintenance". It is also not clear if engine testing noise will be assessed under ground noise or fixed noise sources. It is proposed that engine testing noise should be assessed as a fixed noise source in accordance with BS4142.	
Alternative options	Volume 1, Chapter 16	The Airspace Change Process (ACP) is proposed to be developed separately, and will continue after the DCO process has concluded the PEIR will need to be based on a number of indicative flight path options that will be further refined. The scheme parameters to be assessed should be based on the 'worst case' combination of scheme elements including worst case flight paths. It is not clear how impacts would be assigned as a result of DCO or ACP processes.	Worst case scheme parameters to be adopted in the assessment in relation to flight paths.	Worst case scheme parameters to be adopted in the assessment in relation to flight paths.
Cumulative effects	Volume 1, Chapter 16	Some of the displaced activities (paragraph 3.3.37) would appear to be essential activities to the operation of the airfield, and these are combined into cumulative effects.	In general, it is accepted that cumulative impacts will be assessed qualitatively. However, in some instances it may be feasible to combine inter-project contributions quantitatively rather than qualitatively i.e. contribution from road, rail and aircraft.	Quantitative approaches to cumulative assessment in relation to noise should be explored and justification for a qualitative/quantitative method justified.
Mitigation	Volume 1, Chapter 16	The Scoping report states that mitigation in the form of noise insulation will be considered. It is not clear how this will be considered where existing properties already have noise insulation.	If the project is taking existing noise insulation into account, HSPG would expect to see verification that noise insulation is still working as intended in those properties.	If the project is taking existing noise insulation into account, HSPG would expect to see verification that noise insulation is still working as intended in those properties.

Chapter 17 – Traffic and transport				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**

EIA Methodology	Volume 1, Chapter 17, Section 17.9.17	The methodology references the Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment, 1993). Following recent correspondence with the Institute of Environmental Management and Assessment (IEMA) we have been advised these guidelines should be treated with a 'health warning.' Whilst the Guidance remains the most current version, many sections are out of date. It also does not cover topics which have become more prominent since 1993 such as Health. A greater use of professional judgement is also now advocated in place of the previous 'threshold based assessment.'	Recognising that there can be limitations to the accuracy of a traffic model the lower down the roads hierarchy, it may be appropriate for HSPG to provide HAL with guidance with respect to sensitive or heavily congested locations in each respective Borough/ Council area.	A list of sensitive areas on the local road network (this can reflect congestion levels, road safety, potential rat-runs or economic importance) should be developed in conjunction with HSPG so that these can be incorporated into the baseline conditions to be considered by Heathrow. The ES Scope states at Chapter 17, para 17.8.1 that *"no effects have been scoped out of the assessment",* however the prescriptive use of the thresholds outlined in the IEA Guidelines may potentially scope out sensitive locations due to the simplistic nature of this approach. As advised by IEMA, care should be taken and greater emphasis ought to be placed on professional judgement when considering the significance of an effect in terms of changes in traffic volumes. [*For example, a 1% increase in traffic on a congested network may have a high impact whereas a 10% increase in traffic on a lightly trafficked road may not*]
Mitigation	Volume 1, Chapter 17, Section 17.10.14 "…Heathrow would be committed to securing the necessary mitigation to address the impacts of the DCO Project."	-	-	The Scoping Report states that there is a commitment to providing the necessary mitigation to offset the impacts provided that it is demonstrated through the EIA and TA process. HSPG to be consulted to ensure traffic and transport impacts are fully identified and appropriately mitigated. Bespoke plans may be required to specify some of the mitigation proposals for example a Construction Traffic Management Plan and a Construction Workforce Travel Plan.

Chapter 18 – Water environment – surface water aspects				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 18, Baseline sections	No indication in the main text of the current status and objectives of the water bodies in the study area. No reference to derogations for disproportionate costs for phosphate (currently Poor for example in some water bodies). Section 8.6.41 Protected Sites - those with water dependence should be listed as they (should) have Very High sensitivity (for water). No reference has been made to main rivers and ordinary watercourses - so HSPG partners have no clear picture of which attributes they may have responsibility for. Table 18.8 (impacts) does not identify nutrients as a likely impact (nutrients are the focus of modelling described in the surface water assessment in Appendix 18.3) - all those identified are a result of construction or changes to source water (i.e. another catchment from diversion or change in baseflow dilution) or air deposition (from increased aviation. None of these warrant the modelling for nutrients (laid out in Appendix 18.3). No focus on the likely substances to be found in runoff: • Construction - sediments, oils and chemicals from spillage - all controllable by best practice. • Operation - de-icer, herbicides, pesticides, some metals. All related to intermittent - should follow a risk based approach - look at what is draining where and what is likely to be in that catchment - what SUDs and other mitigation should be applied.	Provision of a table to show the current status and objective of the water bodies and their sensitivity/importance so that the significance of any impacts can start to be gauged (need this to be able to scope attributes in or out). Modelling for nutrients is not considered an appropriate method of identifying potential impacts as nutrients do not represent a likely impact of the scheme. Substances likely to be found in runoff need to be addressed in the assessment methodology. Significance criteria should follow standard guidance, for example DMRB in particular for road components, and criteria needs to be more detailed than the coarse High/Med/Low approach suggested at present. Main rivers and ordinary watercourses should be identified in the assessment.	It is considered that there are significant flaws in the methodology proposed which does not adhere to best practice guidance and appears to adopt methods which are not relevant to the types of issues likely to be associated with the proposal. HSPG recommend a full review and update of the proposed assessment approach for surface water issues as it is currently not considered fit for purpose.

	Volume 1, Chapter 18, Approach	Sensitivity of receptor is coarser than the norm - just High/Med/Low; approach is not based on WebTAG or DMRB (DMRB uses Very High as an additional level for designated/sensitive sites) Descriptions of sensitivity and impact are not based on well used methods like WebTAG or DMRB. E.g. EQS used for low impact but not cited in other categories. DMRB needs to be followed for all the road aspects of the design (not even mentioned) - it would be best to focus on this approach for the runway areas too (i.e. rainfall linked drainage to outfalls). Whole approach is taken as if for new continuous discharges - i.e. WWTW where the make-up of the discharge is better understood. Using P as a surrogate seems to be a hangover from default description of modelling for WWTWs.		

	Volume 1, Chapter 18 Mitigation	Mitigation is not well covered - it refers to Section 3 for drainage, but there is very little information provided. Overall, there is no attempt to value the baseline or gauge the magnitude of likely effects. The assessment methods do not appear to be lined up with the impacts that are expected and could be misleading - for example large scale modelling of nutrient budgets is not going to show intermittent quality issues for sediment, de-icer and potential metal/plastics contamination. Sanitary/ continuous discharges are likely to be treated by Thames Water as current, so should have no direct permit for discharge to receiving waters	Reference should be made to current drainage balancing and treatment in the baseline and how this will be employed for the extension. Information on the type of drainage features they may have to adopt and maintain. All the receiving water re-alignments and diversions will have to take account of WFD and will require enhancements and offsetting. The report should be more explicit on this. Instead of nutrient modelling, focus should be on SUDs drainage and pollution prevention that will alleviate the majority of impacts. It is unclear as to why reservoir and lake modelling is focusing on nutrients? This approach seems to be driven by compliance for the SPA but is likely that there will be limited nutrients from Heathrow? It is recommended that the conceptual model should just link standing water to the source water – as most of the embanked reservoirs will be pumped from nearby rivers. If there is a pathway from the project/source risk from the project then consider modelling. Using SIMCAT for construction impacts may not be the best approach - best practice pollution prevention should be applied as it is a risk assessment for spillages and potential incidents.	
	Volume 1, Appendix 18.3 - Surface water assessment	New continuous discharges should be small scale and covered by EPA permit so modelling is probably not required beyond RQP. New intermittent discharges should be controlled by attenuation and addition of best practice SuDS features to pick up WQ issues, allow drainage to be isolated in emergency etc - again it may not be necessary to model this?	-	

Scheme design	-	-	Rivers/water courses are addressed and intertwined with runway, roads, etc. The enhancement of Green and Blue infrastructure (including habitats, biodiversity and access routes for recreation) should be approached as design objectives / principles and not left to deal with the consequences of other decisions. Rivers will need to be culverted but the Colnbrook should be retained as an open channel with as much of other water courses remaining as open channels. Rivers, water bodies and storage are interconnected systems and need to be considered on a macro scale - diversions at one point will have impacts at another. Need information and clarity on what happens with surface water run-off and any exceptional release of polluted waters.	-
Chapter 18 – Water environment – groundwater aspects				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA methodology	Volume 1, Chapter 18, Water environment Appendix 18.1 WFD compliance assessment methodology Appendix 18.2 Numerical Groundwater Modelling Method Statement Appendix 18.4 Flood Risk Assessment Method Statement (groundwater sections)	<u>Monitoring</u> Monitoring groundwater levels in the gravels across the areas of interest and adjacent to water courses is essential. This is referred to briefly in Table 18.10 and in Appendix 18.2. Baseline monitoring should be for at least 1 year in order to provide sufficient data for conceptualisation and model calibration. <u>WFD groundwater bodies</u> The list of water bodies to be considered for WFD compliance in Appendix 18.1 includes only one groundwater body – Lower Thames gravels. However, Appendix 18.2 suggests there is also a risk to the Chalk e.g. in listing the potential environmental receptors in Table 18.2.1, or e.g. text in Section 5.4 (of 18.2) which refers to "interaction with the deep subsurface" and that "some elements of the Project may sit beyond the spatial extent of the Lower Thames Gravels Groundwater Body (e.g. to the north, where the Cretaceous Chalk is unconfined)." Chapter 18 of the main	Further detail would be expected on groundwater monitoring in future scoping report and PEIR. Potential effects in relation to the Chalk should be included in the assessment, or justification provided for scoping out. In relation to WFD compliance assessment, the assessment should be presented as results for individual tests. The extent of the groundwater modelling and gravel aquifer should be shown on a plan. The scale at which it is appropriate to use the model Groundwater flood risk model will need further consideration.	Overall approach to groundwater aspects appears reasonable. HSPG would expect to see the clarifications listed here addressed in the future scoping report and PEIR.

		report also refers to potential impacts on the Chalk as well as gravels. WFD groundwater tests With regard to the approach to WFD compliance, screening and detailed assessment (Section 6 and 7 of Appendix 18.1), it would be more transparent if the groundwater assessment is presented as results for each individual test, rather than just overall quantitative and overall chemical effects (e.g. for quantity: Saline or other intrusions, surface water, GWDTE, water balance). Extent of groundwater model Figure 18.2.3 in Appendix 18.2 does not show the proposed extent of groundwater modelling, nor the extent of the gravel aquifer. Groundwater flood risk modelling Appendix 18.4 gives a brief account of how groundwater flooding risk will be assessed, referring to use of the groundwater model. The scale at which it is appropriate to use the model will need consideration, as it may not work well for local scale flood issues (this is mentioned in Appendix 18.2). Careful interpretation of model outputs will be required. Document formatting Appendices 18.1 and 18.4 include quite a few typographical errors, particularly around bullet point format, which hinder interpretation.		
Chapter 18 – Water environment – Flood risk aspects				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA methodology	Volume 1, Chapter 18, Baseline	Local watercourses are described in “Surface water features”. Surface water flood risk should be considered additionally to both fluvial and reservoirs. This distinction is not clear in Section 18.6.	There should be a clear distinction between fluvial flood risk (including main river or ordinary watercourse), surface water flood risk, reservoirs or canal (artificial) sources of flood risk.	Overall approach to flood risk aspects appears reasonable. HSPG would expect to see the clarifications listed here addressed

		Figure 18.1 demonstrates the water environment study area within the context of the assessment. Figures 18.2 and 18.3 demonstrate the distinction between main rivers and ordinary watercourses. A more detailed map would provide greater clarity. No mapping of surface water flood risk has been provided. Although this is listed in the Water environment data sources table (Table 18.4) and briefly discussed in Section 18.6.36. A more detailed assessment of surface water flood risk would be expected at a later stage.		in the future scoping report and PEIR.
	Volume 1, Chapter 18, Approach	The Flood Risk Assessment and EIA should adopt DMRB criteria (DMRB uses Very High as an additional level for designated/sensitive sites) and be NPPF compliant. The Flood Risk Assessment should demonstrate that there is no increase to flood risk as a result of the proposed development, to the Heathrow site or any of the satellite developments. Sewer flooding was not listed as a source of flooding in the scoping report; HSPG expect this flood source to be considered in the Flood Risk Assessment, as detailed in Table 18.11. Detailed modelling of the proposed culverting and diversion must be completed to demonstrate that any works to the watercourses will not have any adverse impacts on the watercourses or increase flood risk to the surrounding area. A more detailed map of the sections of the watercourse that will be modified should be provided in the Flood Risk Assessment.	The FRA and EIA should adopt DMRB significance criteria and be NPPF compliant. The risk of sewer flooding should be included in the assessment.	
	Volume 1, Chapter 18 Mitigation	A level for floodplain compensation should be provided for any lost flood storage and any loss of floodplain as a result of the development. The Scoping report provides no indication of the current preferred locations for floodplain compensation. Culverted river corridors are proposed to ensure connectivity remains across the proposed development. HSPG would expect to see hydraulic modelling to demonstrate that there are no adverse impacts to flood risk as a result of culverting the river corridor and combining the Colne and the Wraysbury watercourses.	All floodplain compensation areas should located away from any areas of development allocated in the local plan. HSPG would expect to receive more detail of the ownership and maintenance responsibilities of the floodplain compensation areas in the Flood Risk Assessment. Hydraulic modelling to demonstrate that there are no adverse impacts to flood risk as a result of culverting the river corridor or any new open channels should be undertaken	

		Demonstration that there would be no increase to food risk as a result of any new open channels would be expected as well as details of ownership and maintenance responsibilities.		
	Volume 1, Chapter 18, Appendix 18.4 – Flood Risk Assessment	HSPG would expect to see mitigation and floodplain compensation included within the Flood Risk Assessment. A flood plan and access and operating arrangements in extreme flood events should be outlined in the Flood Risk Assessment. Justification for the sequential test and the exception test within the Flood Risk Assessment should be provided The level at which mitigation is required (as a result of modelling flood risk) should be discussed and agreed with the Environment Agency and HSPG.	Inclusion of a flood plan and access and operating arrangements should be included in the FRA. Justification for the sequential test and the exception test within the Flood Risk Assessment should be provided.	
Chapter 18 – Water environment – Water Framework Directive				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 18 and Appendix 18.1, Table 18.1.1	Current status is not identified in the main report chapter, although the overall status is shown in the appendix. However, there is no acknowledgement for the Reasons for Not Attaining Good (RNAG) and therefore no understanding of the overall current pressures which give context to the proposed options when commenting.	Improve insight into the water environment.	Recommend inclusion of the RNAG and mitigation measures.
	Volume 1, Chapter 18, Table 18.14	Sensitivity Criteria: Does not conform with recognised methods, e.g. DMRB. See: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section2/ha20508.pdf – Table 2.1 and https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/638648/TAG_unit_a3_envir_imp_app_dec_15.pdf - Table 14; Both of which included a "very High" classification for sensitivity and importance respectively. Sensitivity criteria is quite simplified and does not touch on specific sediment or morphological conditions, nor any supporting fluvial processes for habitats	-	Expand on the sensitivity criteria to include a category for "Very High" and add more clarity on observable conditions (specifically for hydromorphology) for the sediment regime, channel morphology and natural fluvial processes.
	Volume 1, Chapter 18, Table 18.15	Magnitude of Impact: as above, regarding guidance, typically terminology is *Neutral, Slight, Moderate, Large* and *Very Large* (Webtag) or *Major* to *Minor* (DMRB); does not differentiate between *Adverse* and *Beneficial*; does not	-	Consider a change in terminology to be in line with recognised relevant standards, and include potential for beneficial effects.

		account for potential for beneficial effects resulting from the proposed works; does not account for *No change* either.		
	Volume 1, Chapter 18, and Appendix 18.1	Does not differentiate between *main river* and *ordinary watercourses*; The responsibility for ordinary watercourses lay with the LFA or IDB.	Opportunity to ensure the protection of the wider water environment, not only those designated under the WFD.	Identification of the entire potential impact on watercourses, both main and ordinary.
	Volume 3, Appendix 18.1	Lengths are based on 1:50k maps – this seems a little coarse given there are more accurate datasets available, e.g. OS Open Rivers 1:15-30k or Mastermap or the Digital River Networks (DRN)	Will also enable the smaller ordinary watercourses to be identified. Ensure thorough mitigation for all water bodies.	Better scale to encourage more accurate mapping and impacts assessment.
	Volume 1, Chapter 18, Table 18.1.5	Statement reads "An appropriate percentage and/or channel length" – what is the appropriate % or length?	Transparent screening criteria to be discussed upfront with EA and stakeholders to agree what constitutes low – high?	More specificity on the quantitative assessments.
Alternative options	HSPG slide deck 6th June issue, River Diversion Options and General Assembly Options 1 - 4	The descriptions on the potential GA options are not clear nor intuitive. The realignment locations and extent are not totally clear.	Opportunity to improve the general understanding of the potential options for the local community, helping engage and get better feedback in the long run.	More detailed layouts and labelled impacts required to thoroughly understand the potential impacts further.
Cumulative effects	Volume 3, Appendix 18.1	Limited acknowledgement of cumulative impacts in the Appendix document	-	Clearer scope on how the cumulative impacts will be assessed for the water environment. EIA methodology asks for two types of cumulative impacts: … from a single project; and …from different projects (in combination with the project being assessed) Not clear which is being recommended.
Scheme design	HSPG slide deck 6th June issue, River Diversion Options and General Assembly Options 1 - 4	Too few details on the watercourse realignments and the proposed tunnel. Descriptions of the options are not intuitive and slightly confusing. There is little clarity on the design and mitigation for the tunnel environment.	-	As above, more detailed focus on the scheme layouts for the realignments. Labelled and clearly shown on the plans.
Mitigation	Volume 1, Chapter 18, and Volume 3, Appendix 18.1	Little detail on the potential mitigation proposed. Only the types of mitigation that will be considered.	Greater details on the tunnel and realignment mitigation.	Standard mitigation or best practice guidance should be outlined at the outset.

General – Cumulative effects		
Aspect	**Volume/Report references**	**Questions and concerns**
EIA methodology	Volume 1, Table 4.6	**Scope of Assessment table**: The table is inconsistent with methodology provided within Volume 1 and 3. All chapters should refer to assessment of cumulative effects and In-combination effects within the Scope of Assessment as well as for both construction and operational phases.
	Volume 1, Section 4.6.6	PINS guidance suggests that exclusion/ inclusion criteria should be applied to stage 2 and not stage 1 as is set out here.
	Volume 1, Section 4.6.6	The methodology states that for Tier 1 developments a five-year exclusion criterion is in place. Some very large developments may have complex planning permissions with ongoing issues and may have temporal overlap despite their original planning permissions being approved outside of this 5-year timeframe. Justification for exclusion or confirmation of inclusion should be provided.
	Volume 1, Section 4.6.6	The Scoping Report suggest that Tier 3 developments have insufficient information to undertake Cumulative Effects Assessment. PINS advice note 17 recognises this may be a limitation and has the following recommendation *3.4.2 The assessment should be undertaken to an appropriate level of detail, commensurate with the information available at the time of assessment. Information on some proposals may be limited and such gaps should be acknowledged within the assessment, moving from a more quantitative to a more qualitative assessment as the availability and/or certainty of information decreases. The uncertainty in such assessments should be clearly documented.* Despite limited information, it is likely that high-level qualitative assessment could still be undertaken for the majority of sites with spatial and temporal information. In particular identification any conflicting proposed land uses or potential effects on sensitive receptors within the vicinity of both developments.
	Volume 1, Section 4.6.7	It is proposed that the development schedule be frozen six months ahead of each phase of the assessment. If major DCO or EIA projects are anticipated to or do come forward in this intervening time they should be considered at each stage. The development schedule should be as up-to-date as possible at each phase; though some time lapse will be necessary, it should be minimised. This would also reduce the likelihood of being asked for further detail and assessment during the examination stage [as noted in PINS advice note 17 para.3.4.9]. This also applies to Volume 3 para. 3.4.1.
	Volume 1, Section 4.7.3	Clarification is required on identification of receptors. Will this involve all receptors within the ZoI being considered or is there an alternative spatial scale. Assets that fall outside of community areas should also be considered e.g. sensitive areas including SSSI or regional parks in the vicinity of the scheme that may be used by wider communities or be of national & regional significance. How are receptors identified? And to what spatial extent?
	Volume 3, Appendices Table 2.1	**Stage 1** - The ZoI appears to be limited, and it is considered that very large developments or specific types of development e.g. transport-related are likely to both impact on and be impacted by Heathrow expansion. These should be considered for inclusion despite lying outside the ZoI e.g. any DCO within the Transport Modelling area may be more appropriate. All NSIPs in region which could be affected by Heathrow expansion should be considered and full justification provided if scoped out.

	Volume 3, Appendices Section 3.2.7	5-year limit for inclusion in the development schedule may result in very large or complex developments being missed out of the assessment. It is recommended that the assessment include all extant permissions.
	Volume 3, Appendices Section 3.2.8	Para. 3.2.8 states that NSIPs within 10km of the scheme will be considered. This appears to contradict para. 3.2.9 which says that Tier 2 (NSIPs with Scoping Opinions) will be considered within ZoI.
	Volume 3, Appendices Section 3.2.13	Where information on type of development, and spatial and temporal data is available it is thought that a high level cumulative effects assessment is possible. Although it is agreed that individual receptors and/or environmental topics may not be assessable, a high-level assumption-based summary on main issues is likely to be achievable for many sites allocated in local plans or similar.
	Volume 3, Appendices Section 3.2.15	Whilst all developments of a certain size and threshold are required to undertake EIA this does not mean that all effects will be mitigated by either Heathrow Expansion Project or the 'other development'. Some losses are irreversible (e.g. ancient woodland) and should not be considered by a piecemeal approach but rather through a '*holistic mitigation strategy*' [PINS advice note 17; para. 3.4.12]. It is not suitable to leave it to 'other developments' to provide mitigation if there is likely to be a significant cumulative effect in the future. Due to the long timescales with this project, temporal overlap of site allocations in local plans is possible, even where these have not yet submitted planning applications.
	Volume 3, Appendices Section 3.4.1	See comment above on development schedule freeze period.
	Volume 3, Appendices, Table 3.1.1	The ZOI table should clearly set out distances or method of what constitutes 'area over which effects'. The latter suggests professional judgment has been exercised, but does not provide any further detail or justification for these spatial areas. For transparency the justification for the ZoI should be summarised here.

Our ref: SHARE/62573852
Your ref: TR020003

Jeremy Bloom
Network Planning Director

Highways England
The Cube
199 Wharfside Street
Birmingham
B1 1RN

The Planning Inspectorate
3/18 Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN

12 June 2018

via Email: HeathrowAirport@pins.gsi.gov.uk

Dear Sir/Madam,

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11

Application by Heathrow Airport Limited (the Applicant) for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the Proposed Development)

Scoping Consultation

Under the Planning Act 2008 (as amended) and the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, Highways England is a statutory consultee on applications for Development Consent Orders likely to affect roads for which the Secretary of State for Transport is the highway authority (the Strategic Road Network (the SRN)).

Heathrow Airport is connected directly to the SRN, via access junctions onto the M25 and the M4 Spur, and is in close proximity to the M4, M3 and M40 motorways. In addition, the Proposed Development will instigate significant changes to the SRN, including the provision of a new runway which crosses the M25 between junctions 14a and 15.

Highways England welcomes and encourages pre-application discussion on schemes which will impact the SRN. We therefore welcome the opportunity to provide advice on the scope of any Environmental Statement, in respect pursuant to the procedures set out in the Infrastructure planning (Environmental Impact Assessment) Regulations 2017, in respect of the Proposed Development.

We have set out below both general and specific areas of concern that Highways England would wish to see considered as part of an Environmental Statement. The comments relate specifically to matters arising from Highways England's responsibilities to manage and maintain the SRN, as set out in our Licence.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
Highways England Company Limited registered in England and Wales number 09346363

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Comments relating to non-trunk roads should be sought from the relevant local highway authorities.

General aspects to be addressed

Highways England's principal concern with any development proposal is the impact on the sSrategic Road Network. The Applicant has commenced traffic modelling which will be used to support their proposals, and is sharing information on the development of these models with Highways England. Prior to DCO submission, Highways England will need to be satisfied that the impact of the Heathrow development on the SRN has been modelled robustly and, if necessary, all schemes to provide capacity on the network to accommodate the development will achieve their objectives. Particularly, given the complex road layout in the area, microsimulation modelling should be used to demonstrate the impact of the Proposed Development on the SRN, and Highways England would welcome the opportunity to review this as part of the Modelling Technical Working Group that we have jointly established.

We welcome the reference in Table 17.1[1] to specific government policy on the appraisal of development proposals with regard to the SRN, which is contained within DfT Circular 02/2013: The strategic road network and the delivery of sustainable development (the Circular). The Applicant will need to demonstrate that these tests have been addressed through the development of its planning application.

An assessment of transport related impacts of the proposal should be carried out and reported as described in the Department for Transport *'Guidance on Transport Assessment (GTA)'*. It is noted that this guidance has been archived, however it still provides a good practice guide in preparing a Transport Assessment. In addition, the Ministry of Housing, Communities and Local Government (MHCLG) also provide guidance on preparing Transport Assessments.

Traffic and environmental impact arising from changes to the SRN, the increase/re-routing of traffic post-opening (including phased opening) of the Proposed Development, disruption during construction, traffic volume (including cumulative effects), composition or routing change and transport infrastructure modification should be fully assessed and reported.

Adverse change to noise and air quality should be particularly considered, including in relation to compliance with the European air quality limit values and/or in local authority designated Air Quality Management Areas (AQMAs).

As stated in our response to the Applicant's non-statutory consultation in March 2018, to assist Highways England's review of the Environmental Statement, we would like to receive an "essay plan" setting out the proposed approach, format and contents of the document, as well as information about how the document will be consulted on, including whether or not this will be in the form of targeted questions focused on getting feedback

[1] EIA Scoping Report – Chapter 17: Traffic and transport, Table 17.1

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Highways England Company Limited registered in England and Wales number 09346363

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on specific elements. This will assist with resourcing availability of our various technical experts.

This should include details of supporting figures, annexes, management plans, documentation dealing with mitigation, and other associated documents relating to EIA.

Location specific considerations

Highways England is already engaged in detailed discussions with the Applicant on matters relating to the design and development of changes to the SRN, as referenced in Table 17.2[2]. Whilst not covered through the Environmental Impact Assessment specifically, the Applicant will need to demonstrate that all proposals for changes to the SRN, whether required to construct the new runway or to mitigate the impact of the development on the network are in line with the various tests described in the Circular, including;

> *11. Local authorities and developers will be required to ensure that their proposals comply in all respects with design standards. Where there would be physical changes to the network, schemes must be submitted to road safety, environmental, and non-motorised user audit procedures, as well as any other assessment appropriate to the proposed development. The Design Manual for Roads and Bridges sets out details of the Secretary of State's requirements for access, design, and audit, with which proposals must conform.*[3]

Highways England is also engaged in detailed discussions, via Technical Working Groups, on the development of robust Traffic Modelling and the related Transport Appraisal (which focuses on the development of the Transport Assessment and the Traffic and Transport section of the Environmental Impact Assessment). Through these meetings, Highways England is providing comments on the assumptions, methodology and the appropriateness of Heathrow's ongoing modelling and transport appraisal, as broadly set out in section 17.9[4], and will assure itself that the work is sufficiently robust to accurately appraise the impact of the proposals on the SRN. I therefore welcome reference to this engagement in section 17.3[5].

The applicant shall identify the distribution of traffic on the SRN as a result of the expansion proposals, and will complete capacity assessments of relevant SRN links and junctions to ensure that the SRN is able to continue to fulfil its strategic function. The Applicant has suggested a number of assessment years within the Scoping Report which will be subject to formal agreement through the engagement highlighted above. For clarity, this assessment should also include the impacts of construction traffic.

Notwithstanding the above, we would expect the applicant to provide a robust analysis of traffic flow on the M25 and M4 corridors, particularly in those areas where there is a material change between the two-runway (i.e. no expansion) and three runway modelled

[2] EIA Scoping Report – Chapter 17: Traffic and transport, Table 17.2
[3] DfT Circular 02/13: The strategic road network and the delivery of sustainable development, paragraph 11.
[4] EIA Scoping Report – Chapter 17: Traffic and transport, section 17.9
[5] EIA Scoping Report – Chapter 17: Traffic and transport, section 17.3

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
Highways England Company Limited registered in England and Wales number 09346363

scenarios. This analysis should also include appropriate junction assessments to confirm that these locations are able to operate effectively on opening of the Proposed Development and beyond.

The applicant shall confirm locations to be assessed in the Transport Assessment through engagement with Highways England via the Transport Appraisal and Modelling Technical Working Groups. This shall include all locations where there is a material change to traffic flows as a result of the application, including those distant from the boundary of the Proposed Development.

Highways England is committed to working with the Applicant to ensure alignment with policy contained within the Circular, and in line with guidance provided by Planning for the future: A guide to working with Highways England on planning matters. Particularly, the Applicant shall share further detail on the scope of their Transport Assessment, for comment on by Highways England, as information becomes available prior to both their statutory consultation and the eventual submission of the Development Consent Order. By providing comments in this way, Highways England would expect that the Transport Assessment robustly addresses all the tests outlined in the Circular.

The above comments imply no pre-determined view on the part of Highways England as to the acceptability of the proposed development in traffic, environmental or highway terms. Highways England is already working closely with the Applicant to understand the impact of the Proposed Development, and we are keen that this proactive engagement continues to ensure that Highways England's requirements are met through the development planning process.

Yours sincerely,

[redacted]

Jeremy Bloom
Network Planning Director

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
Highways England Company Limited registered in England and Wales number 09346363

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INVESTORS IN PEOPLE

NHS
Hillingdon
Clinical Commissioning Group

Boundary House
Cricket Field Road
Uxbridge
Middlesex
UB8 1QG

Tel: 01895 203000
Fax: 01895 203010

http://www.hillingdonccg.nhs.uk

The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol BS1 6PN

Tuesday 19th June 2018

Your Ref TR020003

Dear Madam/Sir,

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11
Application by Heathrow Airport Limited (the Applicant) for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the Proposed Development

Thank you for your letter of 22nd May inviting comments on the information that should be provided in the Environmental Statement (ES).

The EIA Scoping Report is extensive and appears to cover the topics that we would wish to see included. Importantly we note that a Health Impact Assessment will be undertaken (paragraph 12.1.5) to address the requirements of the draft Airports National Policy Statement and that this will include the impact on different populations. We would want to ensure that all the relevant CCGs and health partners are engaged in this process and would ask for clarification as to the timescale, scope and consultation processes involved. We would encourage the use of the tools prepared by the NHS London Healthy Urban Development Unit https://www.healthyurbandevelopment.nhs.uk/our-services/delivering-healthy-urban-development/health-impact-assessment/ or similar.

Chapter 12 Health is of particular interest to the CCGs, although other aspects of the EIA will impact on the health and well-being of the local populations and the requirement for, and provision of healthcare infrastructure and services. This is recognised in the health chapter and reflected through the scoping document, and in the use of the WHO definition of health and well-being.

While there has been some engagement with partners to date, we wish to emphasise the importance of engaging the CCGs and other partners at all stages of the project. Section 4.9 sets out the engagement process so far and the composition of the Heathrow Strategic Planning Group (HSPG). Understandably, this is focused on the local authorities, however given the other three existing groups: expert groups on air quality and noise, and the Heathrow Community Engagement Board - all with a

***Chair**: Dr Ian Goodman*
***Accountable Officer**: Mark Easton*
***COO**: Caroline Morison*

HEALTHY WORKPLACE COMMITMENT 2017
MAYOR OF LONDON

strong relationship with health and well-being we would suggest/ask that a representative from the NHS/health to be on the HSPG. Paragraph 12.3.2 refers to a Health sub-group of the HSPG. It would be helpful to know if this group will continue and its terms of reference, and to ensure that there is appropriate representation from Clinical Commissioning Groups and health providers as well as Directors of Public Health within the local authorities.

The main sources of data used for scoping the health topic are set out in para 12.5.3 and use the latest JSNAs. As the assessments are undertaken, they need to ensure new studies and published data are taken into account.

We support the use of the wider study area for assessing health impacts. However, while the appendices map current health and community facilities it is essential that the assessment takes into account future changes in the health and community infrastructure (both already in the pipeline and in longer term strategies). Figure 4.1 Cumulative effects assessment zone of influence shows health zone aligned with the air quality zone. While there is logic to this, it may be that the area should be extended if the catchments for health facilities are broader.

Table 12.3 Likely significant health impacts. This refers to access to services during construction and operation– 'Change in the ability of local people to access public services which includes health and social care,…' As outlined above this should include both existing and future health facilities, and may need to extend the study area to reflect the catchment areas of facilities, in particular specialist facilities often serving a wider area. Of particular concern is the impact on travel times for emergency ambulances, however, all impacts on travel times to services need to be assessed. These are a factor in people not attending appointments, or attending late and a direct impact on provision/cost to the health service, and potentially adversely affecting the patient and thereby requiring costlier interventions later.

We look forward to further involvement in this development.

Yours sincerely,

[redacted]

Caroline Morison
Chief Operating Officer, Hillingdon CCG

Cc : Dr Ian Goodman – Chair, Hillingdon CCG
Dr Steve Hajioff – Director of Public Health, London Borough of Hillingdon
Tessa Sandall – Managing Director, Ealing CCG
Mary Clegg – Managing Director, Hounslow CCG

Historic England

Our ref: ADMO5939

The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol BS1 6PN

By email: HeathrowAirport@pins.gsi.gov.uk

19 June 2018

Dear Sir/Madam

Scoping Consultation – Environmental Impact Assessment for the expansion of Heathrow Airport

Thank you for consulting Historic England on the scoping report for the Environmental Statement that will accompany the planning application for the expansion of Heathrow airport. .

As the Government's statutory adviser, Historic England is keen to ensure that conservation and enhancement of the historic environment is fully taken into account at all stages and levels of the planning process. Given the unprecedented level of impacts on the historic environment should the airport expansion go ahead in its proposed form, it is clearly critical that these effects are properly understood, assessed and mitigated through the planning process.

Broadly speaking, Historic England welcomes the approach to the assessment of impacts on the historic environment set out in the scoping report by Heathrow Airport Ltd (HAL). We note the significance-based approach to assessment, and welcome the focus on significance arising from the setting of individual assets as well as references to current Historic England guidance documents. We also agree with the study areas identified by HAL to assess likely effects of airport expansion. We offer some detailed comments on particular issues below.

However, we have some concerns in relation to the assessment of cumulative and in-combination effects as they potentially relate to the historic environment. Unlike a number of other chapters, there is no reference to this type of assessment in relation to likely impacts on designated heritage assets in Chapter 11 (Historic Environment). In discussions with HAL as to the emerging design of the proposed scheme, we are aware that in certain areas close to

the expanded airport a combination of a new runway, boundary treatments and noise reduction measures, relocation of displaced land-uses and realigned roads may create more significant effects on the historic environment than if each were simply taken in isolation. Taken together, the physical, visual and noise effects of airport expansion works can potentially have a greater impact on the significance of heritage assets – to the extent that certain of these may no longer have a long-term sustainable use. It is important that the assessment process is able to capture any cumulative effects – while the assessment may in practical terms be carried out differently to the cumulative effects on other EIA chapter topics, the principle is the same.

Detailed comments

Table 11.1: we note that the respective table in Chapter 13 includes the European Landscape Convention. In the interests of consistency, we recommend that the Convention for the Protection of the Architectural Heritage of Europe and the European Convention on the Protection of Archaeological Heritage are similarly referenced in table 11.1.

Table 11.2 and para 11.9.13: consultation with the HSPG is welcome, but we would stress that consultation on the detailed strategy for archaeological assessment, field evaluation and mitigation should include all relevant local government archaeologists. This has not been the case as far as we are aware.

Table 11.3 and para 11.9.6: relevant local historic environment records should be included as data sources, as per the requirements of the revised Airports National Policy Statement (ANPS) at paragraph 5.193.

Table 11.5: this does not reflect the potential effects on the historic environment from the creation of new and/or realigned roads and the consequent traffic that this would entail. In certain circumstances, the visual and noise impacts of these roads may affect the significance of heritage assets through the effects on setting. Please refer to our comments above on the assessment of in-combination effects on the historic environment.

Para 11.9.8: The revised ANPS (paragraph 5.193) requires appropriate desk-based assessment and, where necessary, field evaluation where there is potential for assets of archaeological interest. It is unclear what bullet point 4 is referring to in 'archaeological archive review' and recommend that this is reworded to reflect the ANPS requirements. This desk-based assessment should also include a geo-archaeological review of potential for Palaeolithic remains.

Historic England

Para 11.9.15: we assume that as with the core study area, the methodology contained in the Historic England report on noise effects will be applied (please see https://research.historicengland.org.uk/Report.aspx?i=15740). This would be consistent with the requirements of the ANPS, and should be made explicit in the text.

Para 11.9.28: the proposed mechanism for informed assessment of archaeological significance will require further refinement to enable the recognition of assets of equivalent significance to scheduled monuments, together with a research framework to articulate significance.

Para 11.9.29: in order to reflect the requirements of the ANPS and ensure consistency of approach with the rest of Chapter 11, we would suggest amending bullet point 4 to 'The nature *and significance* of the heritage asset that would be affected'.

Para 11.10.2: as indicated above, the scale of the likely impacts on the historic environment as a result of the airport expansion are unprecedented. Should the scheme go ahead in its proposed form, Historic England will be looking to achieve a commensurate level of mitigation. The list of potential measures should also include a programme of public engagement to involve schools, local communities and other interest groups in understanding and appreciating their local archaeology, built environment, history and places. Given the potential for the expansion of the project to result in heritage assets currently in sustainable uses to be at risk in the future, the list should also include provision for specific measures to protect their viability and therefore significance.

Para 11.10.2 – 1: archaeological investigation should explicitly include building recording, and its purpose should be to advance understand and avoid being a simple exercise in recording 'at risk' assets. As with our comments in relation to para 11.9.28, there should be a commitment to developing and implementing a research framework from the early stages of the project through to completion. There should be a commitment to analysis, publication and museum archiving.

Para 11.10.2 – 2: opportunities should be taken for historic landscape and townscape character and individual heritage assets to influence the design of appropriate elements of the proposed scheme, for example green infrastructure.

In terms of Chapter 13 (Landscape and visual amenity), we would simply stress that historic landscape character should form part of considerations, and that any opportunities for synergies with historic environment conservation identified.

Historic England, 4th Floor, Cannon Bridge House, Dowgate Hill, London EC4R 2YA
Telephone 020 7973 3700 Facsimile 020 7973 3001
HistoricEngland.org.uk
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Correspondence or information which you send us may therefore become publicly available.

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Historic England

Finally, it should be noted that this advice is based on the information that has been provided to us and does not affect our obligation to advise on, and potentially object to any specific development proposal which may subsequently arise from these documents, and which may have adverse effects on the environment.

I trust these comments are helpful. Please do not hesitate to contact me should you require any further information or clarification.

Yours faithfully

[redacted]

Tim Brennan MRTPI
Historic Environment Planning Adviser
E-mail: tim.brennan@HistoricEngland.org.uk
DD: 020 – 7973 3744

Horton Parish Council
Clerk to Horton Parish Council
C/O Champney Hall, Stanwell Road, Horton, SL3 9PA
Clerk@HortonParishCouncil.Gov.uk ;www.HortonParishCouncil.gov.uk

Heathrow Consultation
Via email: Expansion of Heathrow Airport (Third Runway) HeathrowAirport@pins.gsi.gov.uk

19th June 2018

Dear Sirs,

RE: TR020003 - Expansion of Heathrow Airport (Third Runway) - EIA Scoping Notification and Consultation

We wrote to you by email on 25th May, to object most strongly to short timescales for the scoping notification and consultation for expansion of Heathrow Airport to a third runway. In your response you state that there can be no extension of time for any comments. As stated, we are a small Parish Council with limited resources and so cannot make comments on a line-by-line basis to your scoping consultation.

However, we do wish to re-state our objections to the third runway proposals for Heathrow and in particular to the proposals set out in this new scoping documentation.

The following points have not been adequately, or in some cases at all, addressed in this consultation document and must not be ignored:

A. Air quality/pollution

1. As already explained, the village of Horton is located between the M25, M4 and M3 motorways. We suffer on a daily basis from the effects of traffic congestion and pollution whereby commercial vehicles use the roads through the village as a 'rat run'. There is no enforcement of so-called commercial vehicle restrictions.
2. Additional construction traffic movements will make this even more unbearable for residents. London and the surrounding areas are already subjected to high levels of air pollution. This has a detrimental effect on the population, remaining agricultural land and heritage buildings in Horton. Daily traffic accessing the airport perimeters will inevitably also worsen this situation.
3. Re-siting of the M25 will only worsen this situation. No realistic measures to address this have been included in your proposals.
4. Erosion of land and green space will worsen air pollution in the area.
5. Existing air quality measures have not worked. Pollution is already at a dangerous level causing damage to health and property.

B. Increased Traffic Movements

1. Road traffic will increase through the Village whilst construction takes place
2. Airport traffic will increase once airport enlargement has occurred

/…….

Horton Parish Council
Clerk to Horton Parish Council
C/O Champney Hall, Stanwell Road, Horton, SL3 9PA
Clerk@HortonParishCouncil.Gov.uk ;www.HortonParishCouncil.gov.uk

C. Permanent Disruption to and Destruction of Ancient Land and Waterways

1. Land bordering and in our Village will be lost to compulsory purchase proposals for airport expansion.
2. Proposals to move waterways to facilitate road and building work will mean permanent destruction of wildlife, habitat and visual aspects. We also believe this will have further negative impacts on the connecting waterways which run through Horton and to the proposed Thames Plan.
3. Existing excess water drainage from the airport already causes issues with established water courses in the area. This will inevitably worsen with additional land use for runways and airport related buildings and roadways.
4. Further agricultural and amenity land will be lost to mineral extraction and the subsequent pollution and road traffic which this involves.

D. Colne Valley Trust

The southern perimeters of Colne Valley Park encompass Horton Village and we therefore support and endorse their objections to the proposed Heathrow expansion.

E. In Conclusion

We still have had no consultation with our Parish Council (Horton) regarding the inevitable impact of the proposed expansion to Heathrow Airport.

Please acknowledge our further objections and let us know when we may expect a meeting to discuss these plans.

Yours sincerely,
Janet Crame

Mrs. Janet Crame B.E.M.
Planning Chair – Horton Parish Council

e.c. Clerk to the Horton Parish Council;
Mrs. F. Bovingdon, Chair- Horton Parish Council;
Stewart Pomeroy, Colne Valley Managing Agent, Groundwork South

From:	Janet Crame
To:	Expansion of Heathrow Airport (Third Runway)
Cc:	boris.johnson.mp@parliament.uk; adam.afriyie.mp@parliament.uk; sajid.david.mp@parliament.uk; Benta Hickley; zac@zacgoldsmith.com
Subject:	Re: TR020003 - Expansion of Heathrow Airport (Third Runway) - EIA Scoping Notification and Consultation
Date:	25 May 2018 17:37:19

Dear Sirs,

On behalf of Horton parish council, I write to object most strongly to the letter we received on 22nd May (by email to our Clerk) regarding the scoping notification and consultation for expansion of Heathrow Airport to a third runway. In the email you state that if we are to respond, the deadline for consultation responses is 19 June 2018, and is a statutory requirement that cannot be extended.

The on line documentation is separated into 3 volumes and many thousands of pages. It is completely unreasonable and ridiculous to expect a small council comprised mainly of volunteers to review, discuss and objectively respond to such a volume of work within 4 weeks. I can only believe that the intention is to over-whelm us and all similar bodies in the hope that no response will be submitted and this will, by your own admission, provide the assumption that there is no objection from us.

We have already spent many hundreds of man-hours studying the various proposals and submissions and somehow managed to respond in accordance with the targets set; clearly to no effect.

Our Village will be directly and negatively affected by any expansion to the airport. We need far more time to review and understand the latest proposals and scoping. Please accord us and our neighbouring councils this courtesy.

Yours sincerely,

Mrs. Janet Crame
Planning Lead - Horton Parish Council
[redacted]

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From:	Baker Paul: H&F
To:	Expansion of Heathrow Airport (Third Runway)
Subject:	RE: Heathrow 3rd Runway - Scoping Opinion Report Comments
Date:	19 June 2018 17:36:21

Hello,

Please find attached comments from Hammersmith & Fulham Council on the EIA Scoping Report.

Given the very short timescale for the consultation and the available resources, our response is not as extensive as we would have liked. We have had to limit our comments to some of the key Chapters in Volume 1 of the Scoping Report. We have not had time to consider and comment on the information in Volumes 2 or 3. We have also looked at the meeting notes for 2 of meetings between the Planning Inspectorate and Heathrow and commented on the issues raised.

We are disappointed that Heathrow chose to publish the Scoping Report before the Government published and formally designated its final version of the Airports NPS. In our view, issuing the Scoping Report in May when it was widely known that the Government would be publishing the Airports NPS in the first half of this year was a mistake and the Planning Inspectorate should have advised Heathrow to delay the Scoping Report until this Summer.

The Scoping Report consists of 3 volumes and over 2,000 pages. As indicated above, it has not been possible to look at the majority of the documents, just some of the chapters in the Main Report. Given the sheer volume of information contained in the Reports, the 28 day consultation period has proved to be completely inadequate. The Planning Inspectorate should have sought ways of allowing consultees more time to draft and submit comments.

Even though the amount of information presented in the Scoping Report documents is extensive, there are many areas where information is lacking, or the details provided are vague and non-specific, making it difficult to provide informed comments on some aspects of the proposals. The document also creates confusion in parts because it is contradictory to the Airports NPS document, e.g. most noticeably in relation to Heathrow's continued insistence that the 3rd Runway does not need to be a minimum of 3,500m long even though this is specified in the NPS. The DCO would presumably be refused if Heathrow stick to this position. All assessments in the EIA should relate to a scheme that complies with the NPS requirements, not one that Heathrow would prefer to build.

There is a lack of critical information in relation to flight path details that make any meaningful assessment of noise impacts very difficult to complete. The approach of completing the DCO process before finalising where the flight paths will be is, in our view, completely wrong. We have raised our concerns on this matter with the Government and Heathrow but they still intend to proceed with the DCO without flight path information. How can the noise impacts of the DCO Project be properly assessed when critical information such as this will not be available?

A further point we must raise in relation to the DCO process is Heathrow's intention to use it to not only develop the 3rd Runway but to also increase the current 480,000 movement limit by an additional 25,000 to provide additional capacity prior to the

opening of the 3rd Runway. Capacity for these additional flights would by created by implementing new procedures and efficiency improvements – i.e. no new infrastructure would be required. The use of the DCO for this purpose is not appropriate in our view. We are surprised that this aspect of Heathrow's proposals did not feature in the discussions with the Planning Inspectorate in February and March prior to the Scoping Report submission.

Although H&F Council did participate in the first round of consultation conducted by Heathrow earlier in 2018, we have concerns about the degree of stakeholder engagement that has been carried out and the limited nature of the consultees involved in developing the Scoping Report. We suggest that the document would have benefitted from a much wider variety of consultees and should have included community group stakeholders.

Detailed comments have been provided on the following chapters of the Main Report (Volume 1) and are attached:

- Chapter 3: The DCO Project
  In summary: We have concerns about Project Design and the Overview presented of the DCO Project which we consider to be inaccurate; the description of the Principle Components of the Scheme conflict with the requirements of the Airports NPS and we have issues with some of the information presented in the Development Programme and Construction section.

- Chapter 4: Approach to EIA Scoping
  In summary: More weight should be put on following the guidance in the Planning Inspectorate Guidance Notes; we have issues with the approach to identifying significant effects; we think the issue of "in-combination" effects is an important one for the 3rd Runway and should be assessed in more detail; finally, the lack of any information on Mitigation in this chapter is a serious over-sight in our view.

- Chapter 5: Air Quality
  In summary: A number of concerns are raised about the need to consider additional policy documents, about the limited scope of consultation with local authority stakeholders, about the study area for the assessment and the use of inappropriate guidance to carry out the assessment and judge the significance of the impacts of the 3rd Runway on air quality; data sources and monitoring proposals need improving for the assessment and the difference between modelled emissions from vehicles and real world emissions needs to be factored in. Assessment of mitigation measures needs much more detail to be robust.

- Chapter 8: Climate Change
  In summary: More consideration should be given to the overlapping nature of this chapter with others; we have concerns about stakeholder engagement activity and the definition of the study area; some of the data sources are dated and we are concerned about how this could impact assessments; there are issues with the proposed approach to the assessment in relation to assessment years, approach to quantification of impacts and mitigation; on

this latter point there is a lack of information on mitigation assessment.

- Chapter 9: Community
  In summary: We have concerns about how the EIA process will be phased to ensure community impacts will be properly assessed; additional information should be provided on mitigation of community impacts; additional policy documents are recommended to help guide the assessment; concerns are expressed about the stakeholder engagement process, as we are surprised to see that community groups have not been widely involved to date in the scoping process; the study area is unclear and no baseline information is presented for the Wider Study Area (which is the area we would expect to fall into); we also have a number of points to make on the approach to the assessment and mitigation matters.

- Chapter 12: Health
  In summary: Recommend wider policy references included such as Public Health England Strategic Plan; we flag up similar concerns to those identified in earlier chapters about inadequate stakeholder engagement and a lack of information on the study area; we consider that community severance issues should be included as a likely significant effect; issues are also raised with the proposed approach to the assessment and mitigation, which as with all chapters is lacking in detail.

- Chapter 15: Major Accidents and Disasters
  In summary: Highlight that we consider H&F to be a stakeholder in this topic given the number of aircraft that fly over the borough which will likely increase when a 3rd Runway is built; flag up concerns on how accident risks can be assessed when we do not have flight path data at this point; additional information to be provided on mitigation.

- Chapter 16: Noise
  In summary: More information should be provided on receptor groups; more consideration required on how to assess impacts on communities already impacted by Heathrow; concerns about stakeholder engagement raised along with a request for better information on the study area; in terms of baseline conditions and data sources, there is concerns about what data on flight paths is going to be used and the proposed use of noise metrics to assess the baseline; a number of points are made about inadequacies in the proposed approach to assessment and mitigation issues.

- Chapter 17: Traffic and Transport
  In summary: we want to see how the concerns raised by the Transport Select Committee will be dealt with; more weight need to be placed on the Mayor's Transport Strategy requirements and its aim to put health and human experience at the heart of the transport system; stakeholder engagement arrangements are too narrow and need to include community groups; we have concerns about the study area and how its extent is to be determined and how baseline data is to be established for traffic and public transport use; a number of points of concern are highlighted about the proposed approach to the assessment and mitigation where a lack of information and detail makes it difficult to consider the assessment will be sufficiently robust.

Also attached are comments on the issues raised at 2 meetings in February and March 2018 between Heathrow and the Planning Inspectorate on the DCO and EIA Process.

Regards,

Paul.

Paul Baker
Lead Environmental Policy Officer

Policy and Spatial Planning
Growth and Place
London Borough of Hammersmith & Fulham

email: paul.baker@lbhf.gov.uk
Tel: 020 8753 3431
Web: http://www.lbhf.gov.uk

Strategic Director of Growth and Place: Jo Rowlands

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Comments on Chapter 3 DCO Project

Project Design

- As with all chapters in the Report, all references to the draft revised Airports NPS will need rerevising to make reference to the final version of the adopted Airports NPS.
- Para 3.1.5. – Reference is made to a long list of component option alternatives being considered and consulted on. It is noted that options for each of the components still exist. It is not stated explicitly here, but this would appear to include the option put forward by Heathrow earlier in 2018 for the 3rd Runway to be 3,200m long. Given that the Airports NPS states that the 3rd Runway must be at least 3,500m in length, how can a shorter runway option still be under consideration? This paragraph also refers to "Consultation 1" undertaken at the beginning of 2018 and notes that feedback from this will inform the design process. Has information on the consultation response been provided and discussed in a separate publication? We are not aware of this information being released. If it is to be used to inform the design of the 3rd Runway then this information should be made public.

Overview of the DCO Project

- Para 3.2.1 – Reference to Figure 3.1 is made here, but where is this Figure?
- Para 3.2.7 – The description of the DCO application does not appear to be complete. Won't the DCO also include an application to increase the maximum number of movements allowed on the existing 2 runways so that extra flights can be handled by Heathrow prior to opening of the 3rd Runway? This should be clarified as this cannot be regarded as "Associated Development" (i.e. development that is required for the 3rd Runway to go ahead). We do not see how the addition of 25,000 additional movements at Heathrow can be regarded as development that is Nationally Significant and suitable for approval through the DCO route. The movement limit at Heathrow of 480,000 was set at the time of the 5th Terminal approval and movements were limited by a condition on the planning approval. It is therefore appropriate that any change to the movement limit should be dealt with via an application to the Planning Authority for a variation of the relevant condition. (For the avoidance of doubt, H&F oppose any changes to the 480,000 limit). The revised draft Airports NPS states that (Para 1.37): "On 21 July 2017, the Government issued a call for evidence on a new Aviation Strategy. The Government stated that in light of the Airports Commission's findings on more intensive use of existing airports, it was minded to be supportive of all airports who wish to make best use of their existing runways, including those in the South East (with the exception of Heathrow, whose proposed expansion is addressed in the Airports NPS)". The new NPS documents has different wording to this but still reiterates that the Government is supportive of airports beyond Heathrow making best use of their existing runways which appears to

exclude Heathrow. The DCO should therefore not include anything in relation to increasing movement limits.

Principle Components of the DCO Project

- Para 3.3.2 – Figure referenced that is not present in the document (also true for Para 3.3.4). It is stated that "The new runway will be between 3,200m and 3,500m in length"…This cannot be the case as all versions of the Airports NPS have always stated that the runway will be 3,500m as a minimum. Heathrow's consultation on a shorter runway and the continued insistence that this component of the 3rd Runway is not set continues to create confusion about the scheme. This section and any other references in the documentation to runway length being anything other than 3,500m need correcting.

Development Programme and Construction

- Para 3.4.2 – It is noted that there is a reference to 3 aims in relation to the construction phase. One of these is to "Spread the benefit of the DCO Project as widely as possible". This should be an aim that is adopted much wider for the whole project, not just the construction phase, with details provided of what the benefits are and how they will be disseminated to those communities that are impacted by Heathrow and its expansion plans (including H&F).
- Para 3.4.17 – Reference is made to an expanded Heathrow providing at least 760,000 ATMs a year and serving 130 million passengers a year. There is at least one reference in other chapters to the 3rd Runway providing capacity for 140 million passengers. Which is it? These sort of facts and figures should be consistent across all chapters and assessments.
- Para 3.4.18 – This paragraph contains further discussion of the extra flights to be allowed at Heathrow through the DCO process. As already outlined above, we are opposed to additional movements being allowed at Heathrow and believe it is inappropriate for the DCO process to be used in this way. No development is proposed to add 25,000 flights, it is to be done via "implementing new procedures and efficiency improvements". How is such a proposal relevant for a DCO for a nationally important infrastructure construction project?
- Para 3.4.19 – states that a number of key operating principles have already been developed and 4 broad examples are provided. None of these have been developed in any detail at this stage and depending on how they are designed and implemented, their benefits are not certain and could be regarded as inadequate to deal with the impacts that the 3rd Runway creates. Issues that we have with the mitigation examples provided include: There is no information on flight paths at the moment so how can impacts associated with where planes will fly be assessed; The night flight ban has not been decided and there are concerns that this will not provide adequate benefits and could actually increase night flights and associated disturbance; the possibility of providing respite from aircraft noise is presented as a positive benefit

but respite will almost certainly be reducing for residents once a 3rd Runway is operational, so of reduced benefit. The creation of a noise envelope is also promoted here as providing a framework for the sustainable management and control of the effects of noise that apparently balances growth and noise reduction and provides certainty about how noise will be addressed in the future. We have concerns that unless designed properly the noise envelope will do little to drive noise impacts down and doubt that such an approach can reduce noise to acceptable levels. In relation to that latter point, we hope that the Independent Commission on Civil Aviation Noise is established as soon as possible by the Government so that it can take full part in the EIA process.

Comments on Chapter 4 Approach to EIA Scoping

Introduction

- Para 4.1.2 – Only reference to the Planning Inspectorate's Advice Note 7 is referenced here. There are other Notes that are relevant (e.g. Advice Note 3). All relevant Notes should be referenced and included in Table 4.2 on their requirements.

Approach to Identifying Likely Significant Effects

- Para 4.2.3 – Reference is made to using professional judgement in assessing whether or not an effect of the 3rd Runway has the potential to be of likely significant impact. Care needs to be taken and decisions should err on the side of caution with our preference being for issues to not be scoped out too early without good reason.
- Para 4.2.5 – With regards to the approach to setting the Study Areas for the assessments, we have commented on a number of chapters where we consider that H&F should be included in the area, although from the information provided we cannot tell what the geographical areas are for any Study Areas so do not know if we included or excluded at this stage.
- Para 4.2.12 – There is a discussion of how major effects will always be considered to be significant and some moderate effects could also be significant in specific circumstances. Minor effects are deemed to be non-significant. However, is there a case to also assess cumulative impacts of effects such as that many minor impacts could equate to a significant impact?
- Para 4.2.19 – Disagree with the proposed approach if not presenting an unmitigated and mitigated scheme as part of the ES. By presenting effects arising from the DCO with mitigation in place suggests we are certain about those mitigation measures being implemented and certain about their mitigation benefits. IS adequate information available to know this with the required certainty? The unmitigated scenario would serve as a useful baseline and should be included.

Spatial and Temporal Scope

- No comment – see specific comments on Study Areas that has been made for each chapter commented on.

Summary Scope of the Assessment

- No comment – see specific comments on each chapter commented on.

Cumulative Effects Assessment

- No comments on the assessment process outlined here. Comments on cumulative effects have been made elsewhere in our submission.

In-combination Effects

- Para 4.7.1. – the sort of impacts that the 3rd Runway will have combined environmental effects. The example given in this section of interaction of environmental factors such as air quality, noise and health is very relevant to the impacts that could arise on single receptors at a single point in time (and in fact impact on many communities in significant numbers – hundreds of thousands most likely).
- Para 4.7.2 – synergistic impacts should be assessed as it may well be the case that receptors who are subject to a range of environmental impacts could experience impacts that are increased due to the combination of effects.
- Para 4.7.5 – We note the proposal to do qualitative assessment based on professional judgement. This is of concern as the main receptors are likely to be large numbers of residents and probably whole communities. Quantification of impacts and costs of those impacts should be provided.
- Para 4.7.6 – Although reference is made here to the proposed areas for community level reporting for in-combination effects, the referenced Figure is not shown here and should be.

Transboundary Effects

- No comment – Comments on Transboundary Effects have been made elsewhere in our submission.

Engagement

- No comment – see specific comments on Engagement that has been made for each chapter commented on.

There is no section on the EIA Approach to Mitigation. This is a major oversight in our view as mitigation is the key component of the EIA.

Comments on Chapter 5: Air Quality and Odour

Introduction

There are some discrepancies within the document that H&F would like reviewed and improved before agreeing the approach to the environmental impact assessment. The following comments raise the issues and suggest an alternative improved approach for judging adverse impacts.

H&F experiences some of the worst air pollution concentrations within the London Agglomeration. Many road side locations exceed the national objective for NO_2 and the major source of air quality pollutants is road traffic. The whole of the borough has been declared an Air Quality Management Area for 2 pollutants: nitrogen dioxide (NO_2) and small particles (PM_{10}). We therefore need to ensure that any large strategic developments within London such as the proposed Heathrow expansion will not result in any adverse impacts to local air quality and impede the Council in achieving compliance with the national air quality objectives.

It should also be noted that in H&F that 24% of road transport PM_{10} emissions originate from the exhaust whereas 76% are generated from tyre and brake wear. Similarly, 40% of road transport $PM_{2.5}$ emissions originate from the exhaust whereas 60% are generated from tyre and brake wear. The assessment of these sources is therefore as important if not more so that assessing tailpipe emissions.

We have concerns about the impacts of any associated air pollution emissions from the proposed airport expansion. Emissions from the onsite airport activities and aeroplane movements have been provisionally assessed and are reported to not be significant outside a 11km by 12km core assessment area. Assessment methodology, combined with the source apportionment should be provided for boroughs who are potential impacted as they are located below flight paths.

Vehicle traffic travelling through the borough resulting from increased aircraft operations at Heathrow are the main concern that will require to be fully assessed as we are located outside the core assessment area. These impacts have been discussed, although have not been fully addressed or fully scoped into the EIA process. It has been reported that impacts outside the core assessment area will be judged following further traffic modelling although this modelling study has yet to be completed, therefore it is not possible to determine what the resulting air quality impacts will be to the borough.

The following comments should be reviewed, clarified, and included within any Environmental Impact Assessment:

Policy and Legislation

Table 5.1 – Provides a list of policy and legislation summary relevant to the application. Some of the documents are currently under review and consultation namely the National Planning Policy Framework (NPPF) and the 2007 Air Quality Strategy for England, Scotland, Wales, and Northern Ireland. Likewise, the UK plan is still under legal challenge therefore any amendments these any these documents has the potential to influence some of the parameters of the any EIA.

Local policy guidance has been omitted from the list and should be referenced and the following documents should be included:

- GLA London Plan (under consultation)
- Mayors Environment Strategy 2018
- Local authority Air Quality Action Plans (AQAP's) have been omitted but should be considered. It is accepted that H&F sits outside the core assessment area although as a minimum Local authority with AQAP within the main assessment area should be included within this list.

Stakeholder Engagement

Table 5.2 provides information on Stakeholder Engagement. In terms of local authorities, the Heathrow Strategic Planning Group is the main source of input into the process so far. The Group represents some authorities that are impacted by Heathrow's current and future operations, but not all and we are concerned that the views of authorities further away from the airport, but still impacted will not be heard if this is the only local authority related stakeholder.

Study Area

Para 5.4.1 – H&F is not included within core assessment area, and it has been reported in Paragraph 5.4.6 impacts from airfield, aircraft movements and increased road traffic because of the Heathrow expansion project has, "*limited impact*". The air quality impacts associated with airfield operations and aircraft movements to H&F may be limited but the impacts of increased road traffic on the road network not only in H&F but across the London agglomeration should be considered further and fully scoped into the EIA.

Para 5.4.2 – states that the study area is fluid and the exact geographical scope of the area may be subject to change. It is stated that background data collection will change depending on geographical changes. Local Air Quality Management technical guidance 2016 (LAQM TG16) provide the guidance in using monitoring data for assessments. Monitoring data, depending on the methodology will require a minimum of 6 months data before it can be used in these comparison assessments to an air quality objective. If the location/size of the core study area were to change consideration of background data will be required to ensure that it is of sufficient quality.

Para 5.4.3 – only states that pollutant concentrations will be compared against air quality objectives "determined on their emission sources", rather than providing a comprehensive list. It is assumed that both Nitrogen Dioxide and

Particulate Matter will be included but this has not been stated. A list is provided in Table 5.8 and Table 5.9 providing some clarification although it should be clearly stated within this section.

Para 5.4.6 – it is stated that aircraft approaching and departing Heathrow have limited impact on ground level pollution concentrations. The LAEI (London Atmospheric Emissions Inventory) states that within H&F approximately 8% of total NO_2 emission results from Aviation, therefore this is a source of ground Level NO_2 that should be assessed.

Para 5.4.8 – suggests that impacts outside the main 12km x 11km assessment area will be judged on an increase in airport vehicle movements along a road link.

Para 5.4.9 - sets the criteria based on Highways Agency, Design Manual for Roads, and Bridges. Volume 11. Section 3 Environmental Assessment Technique. Notably, Road links will be potentially affected by the DCO if the following criteria apply.

- Road alignment will change by 5m or more
- Daily Traffic flows will change by 200 AADT or more
- Daily ADV flows will change by 200 AADT or more.
- Daily average speeds will change by 10km/hr or more

This approach should be revised as we believe it is not stringent enough and will not capture actual air quality impacts.

IAQM joint EPUK guidance Land-Use Planning & Development Control: Planning for Air Quality January 2017 guidance provides Indicative criteria for requiring an air quality assessment. Table 6.2 from this guidance states the following criteria:

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment [a]
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.

IAQM guidance should be used in preference over DMRB to judge if air quality assessments are required. DMRB guidance is from 2007 therefore predating IAQM guidance issued in January 2017.

As previously stated, traffic modelling for the areas outside the core assessment area has not been included, therefore it is difficult for us to judge if the scope of the EIA is sufficient.

Para 5.4.11 – it is stated that average emissions per vehicle in the opening year of the DCO project would be considerably lower than a scheme opening today because emissions from vehicles are constantly tightening. This statement does not take into account recent information from the International Council for Cleaner Transport that states, on average, real-world NO_x emissions from the tested vehicles were about seven times higher than the limits set by the Euro 6 standard. If applied to the entire new vehicle fleet, this would correspond to an on-road level of about 560 mg/km of NO_x (compared to the regulatory limit under Euro 6 of 80 mg/km). Emissions Analytics estimates that 86% of Euro 6 diesel cars are emitting above the NO_x standard in real world driving conditions. The emissions from current Euro 6 (a,b,c) diesel vehicles are unlikely to improve even with Real World Driving Emission (RDE) as this only applies to new cars being Type Approved for sale for the first time from the 1st September 2017 and even these vehicles due to the type approval process will be able to emit up twice the levels of NO_2 emissions due to a conformity factor range of 1.5 - 2.0%. With the uncertainty around vehicle emissions, consideration should be made when judging any impacts. Paragraph 5.4.11 should be reviewed following these recent studies. It should also be noted that tailpipe emissions are only

Para 5.4.15 – discusses construction dust and assessment methodology only and does not include nitrogen dioxide/PM tailpipe emissions associated to construction vehicle transport. It is noted that in Table 5.8 that nitrogen dioxide and particulate matter from construction traffic have been discussed but should construction traffic vehicle trips exceed IAQM criterial along road links outside the core assessment area this should be scoped within the EIA. Table 5.8 also discusses the use of rail transport for moving of materials. The air quality impacts of increased diesel rail vehicles should be considered should they be used to transport construction materials and scoped within the EIA.

<u>Sources of Data used in Scoping</u>

Para 5.5.3 – states that the principal source of air quality monitoring data is Heathrow and partners Air watch website. It is understood that that this project is overseen by a joint working partnership consisting of London boroughs but further details relating to the QA/QC of the data should be included to ensure that it follows the LAQM TG16 technical guidance and is directly comparable to the national air quality objectives.

Para 5.5.5 – states that diffusion tube data has been taken from Local Authorities only. Given the magnitude of this development using only diffusion tubes set out by Local Authorities is considered insufficient as it would be expected that areas with poor diffusion tube coverage would be supplemented with a site specific local diffusion tube study.

Para 5.6.1 – this underestimates the impacts of Heathrow and should clearly state that air quality has been a concern across London, not just singling out the Heathrow region. Discussion relating to emissions should provide quantitative information to supplement the qualitative discussions about ambient air quality conditions across London.

Para 5.6.6 – only focuses on the air quality impacts for boroughs that are located within the core assessment area suggesting that these are the only boroughs impacted. This statement is misleading and contradicts other sections within the scoping report. Paragraph 5.4.8 suggests a methodology to consider any air quality impacts outside the main impact area.

It is recommended that the modelling predictions within Table 5.7 are checked for the future year scenarios for some of the receptors. Receptor ID 16112 for year 2030 does not show significant reductions compared to many of the other locations. It may be a result of local factors, or an error in the modelling. It is still not clear if receptors exist outside the core assessment area in the absence of traffic modelling.

Table 5.8 does not consider construction vehicle emission and rail freight despite being highlighted in paragraph 5.10.5. Using the railway network for transportation of goods would be a preferred option and supported but any air quality impacts associated with using diesel trains should be included in the table and scoped into the EIA.

Likely Significant Effects requiring Assessment

No comments in addition to those made elsewhere in this response.

Effects not requiring Assessment

No comments

Proposed Approach to the Assessment

Para 5.9.1 – it is welcome that the study area will constantly be under review, although keeping study areas under review can cause problems with progressing assessments. For example, insufficient amounts of background data may be an issue. A revised approach would be to undertake traffic modelling to pinpoint any impacts on a larger scale (if any) and then discuss the assessment methodology.

Para 5.9.5 – states that new monitoring stations are proposed. Sufficient data capture (minimum 6 months) will be required before any comparison can be made between modelled concentrations.

There is insufficient information about how the air quality dispersion modelling will be undertaken outside of the core assessment area, should it be required. Model predictions within the core assessment area may be accurate as there are sufficient data points for model verification. However,

extrapolating models across a wider area outside the core assessment area could result in errors and decreasing accuracy of model predictions. Model verification with local monitoring sites outside the core assessment area will be required to ensure that predictions remain accurate and valid although this has not been mentioned.

Para 5.9.25 – it is proposed to use the Highways England Interim Advice Note to assess significance of effects with the magnitude of change detailed within Table 5.10. It is recommended that this method is revised and replaced by IAQM joint EPUK guidance Land-Use Planning & Development Control: Planning for Air Quality January 2017 as this guidance provides impact descriptors for individual receptors. Table 6.6 from this guidance sets the following criteria:

Long term average Concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Explanation

1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.
3. The Table is only designed to be used with annual mean concentrations.
4. Descriptors for individual receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.
6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.
7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

IAQM guidance should be used in preference over DMRB to judge is air quality assessments are required. DMRB guidance predates IAQM guidance and was issued in January 2017. IAQM guidance judges significance based on background concentrations and is weighted to areas where background concentrations are high.

Para 5.9.26 – the criteria outlined here do not appear to cover the costs of mitigating emissions – shouldn't this be covered? Also, what are the impacts (e.g. on health)? This might be covered in detail in the separate Health Chapter, but it should still be referenced here.

Para 5.9.28 – only details receptors that are within the main study area. It has already been discussed that the study area may vary depending on results of traffic modelling therefore it would be expected that receptors will also be extrapolated where impacts have been identified on submission of the EIA.

Para 5.9.29 – refers to the issue of a scheme that causes air quality impacts that affect the ability of a non-compliant area achieving compliance with the Air Quality Directive or that causes a compliant area to become non-compliant. Under such circumstances the scheme should be refused. An assessment of compliance with this criteria should form part of the EIA.

Para 5.9.33 – no details are provided on who sits within the Air Quality Expert Review Group. Further information should be provided about the membership of this group as it appears that will be playing an important role in the air quality assessment process.

Approach to Mitigation

The potential operational strategies mentioned in this section just refer to suggestions from the Airports NPS. Overall, this approach to the EIA assessment seems very vague. There is little information on how the aims (e.g. for surface transport mode share improvements) will actually be achieved. Further details should be provided.

Para 5.10.4 – advises that construction logistic hubs will be utilised which is welcomed. Any hubs will be a destination for deliveries and collection therefore could be areas with many HGV/LDV movements. If these hubs increase AADT above thresholds previously discussed air quality impacts could be realised. There are no details on position/ location of these hubs and will need to be included within the EIA.

Para 5.10.5 – states that the railway may be used to transport materials which is welcomed although as previously discussed it is recommended that the impact of diesel trains on the network should be scoped into any EIA.

Para 5.10.10 – states that car parking will be provided near the site with shuttle buses to places of work. No details of locations of car parks have been provided, although Table 6.1 within the IAQM guidance suggests that developments over certain size thresholds with 10 or more carparking spaces could have an air quality impact. It is recommended that large sits for carparking should be scoped into the EIA.

Comments on Chapter 8 – Climate Change

Introduction

- Para 8.1.4 – Reference is made to the topic of climate change overlapping with other topics included in the EIA such as Chapter 18 water environment and Chapter 15 major accidents/disasters. The assessment of community impacts and health also need to be considered with respect to how climate change could impact on these areas as well.

Policy and Legislation

- Table 8.1 – the Airports NPS references all need updating. WE also recommend the inclusion of references to the London Plan and the London Environment Strategy.

Stakeholder Engagement

- Table 8.2 - So far only engagement with the Environment Agency has been carried out although it is noted in paragraph 8.3.1 that "further engagement with the Heathrow Strategic Planning Group" is planned. The range of expertise provided by the proposed stakeholders is therefore considered to be too narrow and consideration needs to be given to including stakeholders with wider representation and knowledge on climate change issues. Would the Committee on Climate Change not be considered an appropriate stakeholder for inclusion?

Study Areas

- Para 8.4.2 – Reference is made to the study area for the "In combination climate change impact assessment" to be related to the study area boundaries being defined for each environmental topic. At this stage, as final information on these boundaries does not appear to have been provided we cannot comment on the suitability of the proposed study area.
- Para 8.4.3 – Reference is made to using the UKCP09 data as the most relevant source of data. This dates from 2009, so we have concerns about how up-to date or relevant this data still is for 2018. This should be checked and where possible supplemented with other data.

Sources of Data

- Para 8.5.2 – Use of the UKCP09 data is reiterated in this section. As commented above, this is quite dated although we note elsewhere that there are references to use of Met Office and IPCC data.

Baseline Conditions

- No comments

Likely Significant Effects requiring Assessment

- Table 8.3 – Although it is noted in the supporting text that the topics listed in this table on likely significant effects are not exhaustive, we would expect the operational impacts to have wider effects than those highlighted – which focus on landscape elements, water environment and surface transport. Community receptors would be relevant across all activities whereas it is mainly flora and fauna that are highlighted at the moment. This is where input from climate change specialists would help in the development of the assessment.

Effects not requiring Assessment

- No comment

Proposed Approach to the Assessment

- Paras 8.9.5 to 8.9.7 – In this discussion of assessment years there is reference to construction being carried out 2021-2035 which will be covered by the UKCP09 time period of the 2020s (which actually covers 2010 to 2039). For the operational scenario it seems that the future period to be used will be the 2080s. This does not look like adequate consideration of the interim period when the airport will be operational so additional assessment years/periods should be included.
- Para 8.9.27 – It is noted that the proposed approach is largely qualitative. If this is the case, then how will the associated costs of the impacts be assessed or quantified? Also, without quantification of impacts how can an appropriate mitigation package be developed as part of the EIA process as outlined in Para 8.9.26?
- Tables 8.6, 8.7 and 8.8 – These tables provide information on the proposed criteria for assessing the likelihood of impacts in the Climate Change (Resilience) assessment. This approach is different to that proposed for the other climate change assessment (on Combined Climate Change Impacts), but it is not clear why. Further information should be provided and consideration given to using a consistent approach for both.
- As a general point, there is little information on the impact of air travel on climate change. Clearly the 3rd Runway will increase the number of flights annually to/from the airport – how are CO2 emissions from these "in-flight" to be assessed?

Approach to Mitigation

- Paras 8.10.2 to 8.10.5 – The discussion of mitigation measures in this section does not provide any information on what the measures would be or what guidance will be followed in developing them. Also, it is not clear how they will be assessed or their benefits checked to ensure

they are adequate to provide the required level of mitigation. Further information on these issues is required.

Comments on Chapter 9 Community

Introduction

- Para 9.1.4 – It is stated that the Community Assessment will draw on the outputs of other environmental topics and the EqIA. Reference is not made to the traffic and transport impacts in this respect and should be. Also, it is not clear is how the EIA will be phased to ensure that all the required outputs from other chapters will be finalised first before the Community impacts are assessed. It would be useful to clarify this process.
- Para 9.1.5 – This paragraph discusses how mitigation measures will be used to reduce impacts but notes that where mitigation cannot prevent significant impacts, that these remaining impacts will be assessed. More information should be provided on what is to happen where significant impacts cannot be mitigated – what actions will be taken?

Policy and Legislation

- Table 9.1 – Recommend checking for other relevant policy documents such as the Government's "Integrated Communities Strategy Green Paper" and the London Environment Strategy and including them.

Stakeholder Engagement

- Para 9.3.1 – It is noted that there has been little engagement will community stakeholders at this point. The Heathrow Strategic Planning Group is referenced as being included in early engagement on the scope of the assessment, but this Group is not regarded as one that represents a wide range of community group interests. We are concerned about the lack of representation of other non-HSPG groups and of members of the wider community (e.g. residents groups). Reference is made to engaging with local authorities – these should be listed so it is clear who will be included in the engagement process.
- Para 9.3.2 – Discussion of the role of the Heathrow Community Engagement Board is referred to here including comment that the Board "provides an opportunity for the needs of the local community to influence the design and operation of Heathrow". The focus of the Board's membership is very much those authorities in close vicinity of the airport (and in some respects its membership is similar to that of the Strategic Planning Group). We would like to see specific information on how communities that are not immediate neighbours of Heathrow but who are impacted by its current operations and the proposed 3rd Runway (such as H&F) will be engaged and a commitment that their views will also help shape the design and operation of the airport.
- Para 9.3.3 – It is stated that feedback from Consultation 1 will continue to inform the development design in relation to community assessment work, but we are not aware of any outputs from the consultation being published or referenced in the EIA documentation. These consultation

comments and responses should be published. It needs to be clear how comments have been considered and shown to influence the design and assessment process.

- Table 9.2 – As already highlighted, community engagement to date is limited and there are concerns about the prominent role that the Strategic Planning Group has been given in the process to date. There needs to be a much wider and more transparent approach to community assessment.
- Although additional stakeholders are listed in Para 9.3.5, it is the Strategic Planning Group that have been involved in early workshops on developing the scope of the community assessment, none of the other groups listed in this paragraph. Is the scope now set or could feedback from any of these groups influence it? There is a danger that the scope is set too narrowly and relevant issues missed. Further clarification on these issues should be provided.
- Para 9.3.6 – Notes that user surveys will be drawn upon where published and undertaken with regard to users of recreational facilities, spaces and routes. This only deals with one aspect of potential community impacts (on recreation). It is not clear what work will be undertaken to establish baseline information for all of the other uses that are listed in paragraph 9.3.5. If no surveys have been done already, or those that exist are out of date, then new surveys across a range of community uses would need to be carried out and a commitment to do so should be provided.
- Paras 9.3.7/9.3.8 refer to engagement with community facilities that are likely to be directly affected by expansion. This engagement seems to be limited to local schools, but as highlighted by the list in paragraph 9.3.5 there is potential for a very broad level of community facilities and users to be impacted by the 3rd Runway, not just schools. Obviously schools are important, but further information on the proposed engagement programme should be provided.
- Para 9.3.9 – Listening Events have apparently been used to engage with local communities. Feedback from these events should be provided in the community assessment, with particular reference to what local residents have said about what they would like to change about their local community.

Study Areas

- Para 9.4.1 – Reference is made to the potential for the Study Area to change over time and if this is the case then “data collection may also be reviewed and updated”. Similar statements are made in the other Chapters along these lines. If the Study Area does change then an undertaking should be given to do a review of data collection rather than leave the doubt that saying this may be done.
- Para 9.4.2 - Although a discussion is provided on the rationale of how the extent of the Study Area is to be defined, there is no figure provided in the Chapter to show the geographical extent of the area. This needs to be provided.

- H&F is not a borough that would be directly impacted by the physical expansion of Heathrow in terms of land-take etc for the new infrastructure requirements (Para 9.4.3) but our residents would be impacted by the operation of a 3rd Runway once the project is complete and in use (Para 9.4.4). We therefore expect to be included in the community assessment.
- Para 9.4.13 – The wider Study Area is seemingly being defined according to membership of the Heathrow Strategic Planning Group (or authorities who are geographically located within the areas covered by Local Planning Authorities who are members of the Group). As we have already said, the Strategic Planning Group does not represent all boroughs who are impacted by Heathrow or its future operations if a 3rd Runway is developed. Focussing on this Group and its members risks skewing assessments to focus on the immediate neighbours of Heathrow to the detriment of boroughs further away such as H&F. This approach needs to be reconsidered with the aim of balancing representation of authorities and their views.

Sources of Data

- In line with the comments already made, data will be required for the full range of community uses highlighted as potentially being at risk of impacts from a 3rd Runway and the data should cover all geographic areas that could be affected.

Baseline Conditions

- This section only provides information on the “Inner Study Area”. No information on the “Wider Study Area” is provided and this is required.

Likely Significant Effects

- No comment

Effects not Requiring Assessment

- Para 9.8.1 - Although it is stated that no effects have been scoped out of the assessment, if the geographical Study Area is not wide enough then by default all impacts have been scoped out for those areas not within the defined area. Inadequate information has been provided on the Study Area so it is unclear which areas are inside this and which have been excluded.

Proposed Approach to the Assessment

- Para 9.9.4 – Notes that the final details of the assessment methodologies will be agreed with stakeholders during future engagement and response to scoping. As highlighted throughout our comments, this process can only be robust if the stakeholders who are asked to take part in this process are properly representative of the

communities impacted by Heathrow and the increased impacts that a 3rd Runway will bring.

- Para 9.9.12 – Reference is made to using the 2011 Census dataset. It is acknowledged that this is dated and more up-to-date datasets will be used where possible but it seems that some data will be from the Census. The Transport Select Committee has flagged up problems with data such as this particularly in relation to generating information on affected populations as population changes have obviously occurred since 2011. Where Census data has been used, this should be clearly noted. Wherever possible, more up-to-date information should be sourced and used. It may be appropriate in some cases to carry out new surveys as part of the assessment.
- Tables 9.6 and 9.7 – These tables show "Sensitivity to Change" and "Magnitude of Change". Tables such as this seem common to all chapters that relate to impact assessments in the Scoping Report, but the way sensitivities and magnitudes to change are defined are not consistent across the various chapters. This could cause confusion and consideration should be given to using common descriptors – e.g. low, medium, high or negligible, low, medium, high. Some include very high options and no impact options and so on. Consistency would help with interpretation of impacts.

Approach to Mitigation

- As with a number of sections in the Report, mitigation is dealt with briefly compared with the preceding sections. Assessment of mitigation is the most important aspect of the EIA but the Scoping Report is lacking in a lot of detail on this aspect of the work.
- Para 9.20.1 – The description of the EIA approach to mitigation is incomplete. It should be acknowledged that despite use of mitigation measures there could still be significant impacts. What will happen in these circumstances?
- Para 9.10.5 - The compensation/mitigation package measures are discussed briefly here. These are not considered to be adequate as they do not deal with all impacts, just those in the immediate vicinity of Heathrow. This means that boroughs like H&F that are further away but still experiencing negative impacts receive no compensation. How will this aspect of the community impacts of a 3rd Runway be approached in the assessment?

Chapter 12 Health

Introduction

- No comments other than to say that all references to the draft revised Airports NPS need to be updated.

Policy and Legislation

- Table 12.1 - Consider also including reference to the Public Health England Strategic Plan. The work of the Health Foundation may also be worth consideration in developing the health assessment for the EIA and the Health Impact Assessment.

Stakeholder Engagement

- Para 12.3.2. – We note that the Heathrow Strategic Planning Group has set up a Health Group which will be focus for engagement with Local Planning Authorities on health issues. As we have commented on for other chapters, the prominent role of this Group across all areas of the DCO work is of concern given their limited representation. We see that other stakeholders will be approached who will presumably be specialists in assessing health needs and impacts of major developments on the scale of the DCO Project.

Study Areas

- Para 12.4.5 – Relevant chapters for health are discussed in this section and includes the Chapters on Community, Air Quality, Noise, Economics etc, but it does not include reference to the Chapters on Climate Change or Traffic and Transport which we think it should as these are relevant to health issues.
- There is no Figure showing the Study Area or description of the Area. It is therefore not clear which areas are going to be covered by the assessment. This information should be provided.

Sources of Data

- Para 12.5.1 – Reference is made to using the Wider Study Area outlined in the Community Chapter as the basis of where baseline data will be collected. The actual extent of this Wider Study area is not clear though, although a list of authority areas is included in this paragraph. These are not identified as such but appear to be mainly Authorities who are members of the Strategic Planning Group. As commented elsewhere in relation commitments to only collect data for boroughs in the immediate vicinity of Heathrow, this is an approach that is too limited and should be extended.

Baseline Conditions

- No comments

Likely Significant Effects requiring Assessment

- Table 12.3 – Community severance issues should be included in the table as a potential effect of the changes in road traffic. Also, it is not just road users who would be the receptor of impacts, it could be residents or others in the community.

Effects not requiring Assessment

- Para 12.8.2 – Reference is made to other assessments within the EIA process that will consider health impacts. These are highlighted in Table 12.4, but in addition to those listed reference should also be made to the Chapters on Air Quality, Noise and Traffic and Transport.

Proposed Approach to the Assessment

- Para 12.9.3 – Refers to the assessment of health covering all aspects of the DCO Project. Presumably there will be a separate assessment of construction impacts on health and operational impacts. It should be noted that there could be a phase where construction will be continuing on site while phased introduction of additional operations is introduced in which case this construction and operational phase would also need to be assessed.
- Para 12.9.7 – It is not clear why 2016 is set as the baseline for the health assessment when for other assessments 2017 is the baseline. Why is this? The approach to Operational impact assessment appears to be different to other assessments in terms of how operations are proposed to be assessed (in terms of assessment years). The approach outlined her may be a useful one that is used for other assessments in terms of the scenarios to be included.
- Para 12.9.28 – The list of EIA topics here should also include Climate Change.
- Tables 12.5 and 12.6 list out the various health effect subjects and notes which ones will be assessed in a quantitative way and those that will only be assessed qualitatively. Wherever possible, quantitative assessments should be carried out.

Approach to Mitigation

- Para 12.10.1 – We note that negative impacts on health and wellbeing will be compensated for (where they cannot be mitigated). This approach should be followed across the whole EIA – i.e. where negative impacts remain, even after the implementation of proposed mitigation measures, impacted communities should be compensated for the remaining detrimental impact on their environment (not just their

health and wellbeing), although the focus should always be on avoiding impacts in the first place.

- Para 12.10.5 – The mitigation proposals that are listed in this section include runway alternation to provide respite from noise and the night flight ban as well as references to noise related compensation packages. These are presented as positive measures, but we have not seen the detail of any of these mitigation measures and have serious concerns about their ability to properly mitigate impacts. These issues have been discussed elsewhere in our response but just briefly, the respite scheme is expected only provide respite from aircraft noise for 1/3 of the day whereas the current scheme generally provides respite for ½ a day. The night flights ban will not operate for the full night period and we suspect that it will create an increase in night flights rather than a decrease. The noise compensation packages are all too limited to benefit all those impacted communities. They may help those affected the worst, but there are likely to be may thousands of people whose noise environment is degraded as a result of the 3rd Runway, but at a level below the threshold that triggers compensation.

Comments on Chapter 15 Major Accidents and Disasters

Limited comments on this Chapter as follows:

Stakeholder Engagement

- Table 15.2 - We consider that any local authority area that could be impacted by an accident or disaster should be considered to be a stakeholder on this issue and involved in consultations on this matter. The only Local Authority related group indicated in the table of stakeholders is the Heathrow Strategic Planning Group. This Group represents a limited number of Authorities and cannot be considered properly representative of Local Authorities. H&F is not a member of this Group but we are a borough that is currently under the 2 main flight paths for arrivals at Heathrow and it is likely that the 3rd Runway will introduce new flight paths over new parts of the borough. If an aircraft was to crash on its final approach then it is possible that this could impact on H&F. Airspace Safety is an issue of concern for residents as highlighted when the H&F Residents Commission investigated Heathrow expansion issues in 2014/15. Stakeholder engagement therefore needs to be much wider than currently set out.

Study Area

- Figure 15.1 which is supposed to show the Study Area is not provided so we cannot see any information on the geographical extent of the area. The description provided in Para 15.4. makes the area sound limited in scale. As outlined above, we would expect H&F to be included given the amount of air transport movements that will occur through our airspace.

Data Sources

- No comments

Baseline Conditions

- No comments

Likely Significant Effects

- Para 15.7.9 – more information is provided in this paragraph on which aircraft movements will be included in the assessment. Reference is made to departing aircraft that have completed their initial climb and aircraft that are en-route but not yet on approach not being included in the assessment. This approach obviously impacts on the Study Area but was not discussed in that section. These terms also need better definition, including reference to altitudes and distances from the airport and an indication of the local authority areas that would be impacted or included in the assessment area. This also raises the

issue of how impacts that are potentially dependent on where aircraft will be flying can be assessed when we do not know where the flight paths will be. This needs to be explained.

- Graphic 15.1 – This is useful in terms of helping understand the severity and likelihood of accidents/disasters and the risks associated with them, but we note that there is no quantification of the risks, these are just explained as being “broadly acceptable, tolerable and intolerable”. What are the associated probabilities -e.g. 1 in 1 million, etc. This would help understand the approach being outlined and should be provided.

Effects not Requiring Assessment

- No comments

Proposed Approach to the Assessment

- No comments

Approach to Mitigation

- This section provides some examples of mitigation measures but what mitigation measures are proposed to minimise the potential for aircraft related accidents that could impact on the populations under flight paths around 10km from the airport – which is where H&F is located in relation to Heathrow?

Comments on Chapter 16 Noise

Introduction

- Para 16.1.3 – This section explains the 3 key receptor groups for the noise impact assessment. These should be identified on a map and for the quiet areas and community facilities, these should also be listed in a table so it is clear where they are located. Key population centres should also be mapped and listed.
- Para 16.1.6 – In terms of the negative noise impacts that the 3rd Runway will have on communities under flight paths, some people who are impacted will already be experiencing impacts from existing operations. If the 3rd Runway was not built, these people would expect to see improvements in their noise environment under a 2 Runway airport. A 3rd Runway will mean that these improvements do not occur. The noise exposure levels may not have increased, but this scenario should be regarded as a negative impact even if there has been no increase in noise levels compared to current levels as this still represents a loss of improvement.
- Table 16.1 – As with all Chapters, all references to the draft revised Airports NPS will need correcting once the final version of the NPS is adopted. The Night Flight Restrictions for Heathrow also need to be included in this Table. The World Health Organisation guidance on noise should also be a reference document for this assessment.
- The introduction to this Chapter should provide a more detailed explanation about how noise impacts of a 3rd Runway can be properly assessed when the flight paths are not known. As a general point, this also makes it difficult to respond in a meaningful way on the assessment and mitigation proposals as we could be impacted to a greater extent than might be included in the assessment. This is a very significant limiting factor to the quality of the EIA in relation to noise.

Stakeholder Engagement

- Para 16.3.1 – It is noted that the Noise Chapter of the report has been informed by engagement/discussion with various stakeholders, although to date this appears to mainly relate to contact with the Heathrow Strategic Planning Group. Wider engagement with a more diverse group of stakeholders in scoping the report would have been helpful in our view.
- Para 16.3.2 – We note the reference to ICCAN - the Independent Commission on Civil Aviation Noise - and hope that this is established as soon as possible otherwise there is a danger that their input will not be possible.
- Table 16.2 – The Heathrow Strategic Planning Group represent some of the local authorities who would be impacted by noise from the 3rd Runway, not all. We note that 3 meetings have been held with the Strategic Planning Group already in 2017/2018. H&F is not a member of the Group and not located in the immediate vicinity of the airport like many of the Group's members. We presume that we are included in

the consultee identified as “Non HSPG local authorities” although this is not clear as there is no list of authorities provided. Specific information on the authorities to be included in stakeholder engagement should be provided, as should further information on the expected timetable of future engagement. Under “Community engagement”, reference is made to the sound demonstrations that Heathrow provide. These may be of some value to some people but we hope that there must be more substantive proposals for future engagement with impacted communities, including H&F. Further details should be provided. We note schools have been listed as a specific consultee. Para 16.1.3. identified a number of community uses in addition to schools that could experience significant impacts, so will these other receptor uses also be included in the stakeholder engagement process?

Study Areas

- Para 16.4.5 – Although a description of the criteria to be used in defining the Study Area for the impact assessment of noise during the operation phase of a 3rd Runway is provided, the area is not shown in a map. The geographical coverage of the Study Area should be illustrated in this section.

Sources of Data

- Para 16.5.2 – Reference is made to the assessment methodologies being developed so they are relevant for all design options, including those relating to air space design. Given that no information has been made available in the Airports NPS on flight paths at Heathrow when a 3rd Runway is operational, what flight path data will be used in the assessment? This information needs to be provided.

Baseline Conditions

- Para 16.6.2 – It is not clear which areas are covered by the baseline conditions survey/data collection work. This should be clarified.
- Para 16.6.10 – Reference is made to noise exposure data for 2016 which includes information on the population, area coverage and household numbers for the 54dB LAeq 16hr contour. At Para 16.4.5 it has already been noted that it is the 51dB LAeq 16hr contour that indicates the lowest-observed-adverse-effect level (LOAEL). Therefore, information on the population, area and household numbers impacted within the 51dB LAeq 16hr contour should also be included in this section. Similarly Para 16.6.10 refers to night time impacts of noise with reference to the 48dB LAeq 8hr contour when Para 16.4.5. has already noted that the relevant noise contour for the onset of adverse impacts at night is the 45dBA contour. This is acknowledged in the text, but relevant exposure information is not provided for the 51 and 45 dB contour areas and should be provided.

- Para 16.6.12 – Reference is made here to a range of metrics used in reporting noise impacts in the Heathrow Noise Action Plan. However, no impact statistics are provided. These should be provide an illustration of the baseline conditions in terms of noise impacts.
- Para 16.6.14 – Discussion is provided in this paragraph on the xPlane and Webtrak web tools but it is not clear what role these have in providing data on baseline conditions at the airport. Further information should be provided on if and how they will be used. If they are not going to provide baseline information, then this paragraph should probably be deleted.
- Para 16.6.18 – This paragraph refers to "Noise Important Areas". How do these relate or differ to "Quiet Areas"? Further information should be provided to clarify.
- Para 16.6.27 – Reference is made to monitoring in areas which could be "newly overflown". When will this information be known as currently there is no information on flight paths?
- Para 16.6.28 – Reference is made to the Noise Expert Review Group. Who is on this Group? They will be used to review the format and methodology of proposed noise surveys. Is this the only aspect of the noise assessment that they will be involved in? Should they be regarded as a key stakeholder and referred to as such in the earlier section on this?

<u>Assumptions and Limitations</u>

- Para 16.7.3 – Reference is made to using indicative airspace designs in the assessment. How will these be developed and when will they be made available? How many scenarios will be assessed – just 1 or more than this? Which organisations will be involved in setting indicative flight paths for the assessment? We have already flagged up our concerns to Heathrow and the Government about the way that the Airspace Change Process is being run with regard to the Airports NPS and DCO process.
- Para 16.7.6 – Feedback from the "Consultation 1" process will be used to help in the indicative airspace design process. To our knowledge, the comments received as a result of the consultation have not yet been made public. If they are to be used to guide the noise assessment process, then they should be made public. How will it be ensured that the noise assessment does not assess impacts for an airspace design that is unlikely to be implemented at Heathrow?
- Para 16.7.8 – Assumptions will need to be made about aircraft fleet mix to model noise impacts in future years (with and without the 3rd Runway in place). Will there be 1 future aircraft mix dataset that is used for all environmental impact assessments or will different assumptions about future fleet mix be made for each assessment? How will that dataset be developed and in consultation with who?

<u>Likely Significant Effects requiring Assessment</u>

- No comments

Effects not requiring Assessment

- No comments

Proposed Approach to the Assessment

- Para 16.10.7 – Another reference here to the Noise Expert Review Group and their role, this time in relation to providing independent assurance regarding the scientific and policy robustness of the assessment and mitigation proposals. Given their role, it is suggested that more information is provided in the Report on who is on the Group and the exact nature of their role in the noise assessment process.
- Para 16.10.8 – Reference is made to the Government currently establishing ICCAN. It is very disappointing that ICCAN is not in place already as they are a key stakeholder for the noise assessment process. It is concerning that key aspects of the noise assessment are being established without its input.
- Para 16.10.34 – Input information is provided here. Worst case scenarios should be included in the assessment.
- Para 16.10.42 – Reference is made to the use of models to predict the 92 day average summer daytime LAeq 16hr and night time LAeq 8hr noise metrics, noting that "these are the primary metrics for assessing likely significant effects from aircraft noise". In our view, they are one of a number of metrics that are proposed for use. Given that they average out noise impacts over such a long period, they are not considered to be the best metric in terms of representing noise impacts in a way that corelates well with what communities experience on the ground. We are concerned about such emphasis being placed one this single metric when use of a range of noise metrics has been discussed earlier on in the report (and also referenced later in this section in Para 16.10.46).
- Table 16. 8 – Are the noise changes and associated descriptor used in this table set out in other guidelines or have they been developed specifically for this assessment? It does seem a bit unbalanced in terms of there being so many low level impacts such as "negligible", "slight" and "minor" (as well as "no change") within the categorisation of magnitudes in changes of noise exposure. The only other categories are "moderate" and "major". The banding seems too broad with impacts that we would expect to be noticeable and possibly having adverse impacts being rated as minor when a moderate rating may be more appropriate. This should be investigated and clarified further.
- Table 16.9 – What is the significance of classifying the metrics into a set of "primary metrics" and "additional metrics"? Are the primary ones to be given more weight in the assessment? This is not clear and needs further explanation. We see no reason why the metrics should be divided or prioritised like this, particularly as the primary metrics are not considered to be represent community level impacts very well.
- Para 16.10.155 - The effects on "Quiet Areas" is discussed here with reference to other resources that are valued for their acoustic related characteristics. These will be assessed on a receptor by receptor

basis. Although information is provided on the factors that will be used to determine significant impacts, it is not clear how these locations will be initially identified. Further details should be provided on this.

Approach to Mitigation

- As with other chapters, the mitigation section is surprisingly short compared to some of the other sections of the report. Mitigation is a critical aspect of the DCO Project and should be covered in a lot more detail here for noise as well as in the other chapters.
- Para 16.11.6 – the need to strike a fair balance between the negative impacts of noise and the positive impacts of flight is stressed here. The EIA and noise assessment in particular should demonstrate how this is to be achieved. H&F is in a position where it is overflown by thousands of aircraft every week (on westerly operations) which cause noise impacts for residents, including during the early hours of the morning. The borough also experiences other negative impacts due to congestion on the roads and associated air quality impacts as well as over-crowding on its public transport services. Currently there is an imbalance between negative and positive benefits and we are concerned that the 3rd Runway proposal will create additional negative impacts. A better explanation of the "fair balance" approach should be provided.
- Para 16.11.7 – Reference is made to the key ICAO guidance document that will be used to help develop mitigation measures. Both Heathrow and the Government have made comments to the effect that impacted communities will receive a world class package of mitigation measures as part of the 3rd Runway. This commitment should be referenced as well as we expect this commitment to be implemented.
- Para 16.11.9 – Although a brief summary of some mitigation measures is provided it is not clear how they will be measured for effectiveness in reducing noise impacts – how will this be done? We are concerned that the mitigation measures will not be adequate and that adverse impacts will remain even with the mitigation package in place. What is the proposed action in this scenario – further information should be provided on this. The mitigation proposals that are listed in this section include runway alternation to provide respite from noise and the night flight ban as well as references to noise related compensation packages. These are presented as positive measures, but we have not seen the detail of any of these mitigation measures and have serious concerns about their ability to properly mitigate impacts. These issues have been discussed elsewhere in our response but just briefly, the respite scheme is expected only provide respite from aircraft noise for 1/3 of the day whereas the current scheme generally provides respite for ½ a day – i.e. the proposal makes things worse. The night flights ban will not operate for the full night period and we suspect that it will create an increase in night flights rather than a decrease. The noise compensation packages are too limited to benefit all those communities who are impacted. They may help those affected by the highest levels of noise close to the airport, but there are likely to be

many thousands of people whose noise environment is degraded as a result of the 3rd Runway, but at a level below the threshold that triggers compensation. The threshold criteria needs lowering for compensation schemes.

Comments on Chapter 17 Traffic and Transport

Introduction

- Para 17.1.3 – the reference to walking and cycling adjacent to the public highway should say “on or adjacent to the public highway”.

- Para 17.1.8 – as with all chapters in the Scoping Opinion Report, there are multiple references to the revised draft Airports National Policy Statement. All of these will need to be updated now that the Government has published its final version of the Airports NPS. It should be noted that surface transport matters were commented on by the Transport Select Committee in their report on the Airports NPS, They noted that "*While we recognise the intention behind the current condition on surface access in the NPS, we conclude its drafting leaves too much scope for unintended surface access impacts from this scheme. We therefore recommend a condition be included in the NPS that ensures approval only be granted if the target for no more airport related traffic can be met, or that as a condition of approval, capacity be released at the airport, after construction, only when the target is met*". This scenario should form part of the EIA Assessment process. *The Transport Select Committee also stated that “We recommend that the surface access costs in the appraisal, and which support the NPS, be updated and included in the final NPS to reflect the indicative costs of those additional schemes required to deliver on the target of no more road traffic. We are concerned about the absence of detail on proposed changes to the M25. We recommend that the Government work with Heathrow Airport Limited to clarify the proposals and bring greater certainty to the development plans. A key part of this must be the arrangements for diversion of traffic during any works”.* This is also another element of the Surface Access Strategy that needs to be included in the EIA.

- Para 17.1.8 – reference is made to the Airports NPS including a series of targets and requirements for surface access outcomes. These should all be set out and summarised in the EIA and it should be clarified what the difference is between a “target” and a “requirement” and note where necessary that Government has given undertakings in their response to the Select Committee’s recommendations – that it is their expectation that targets such as the mode share targets referenced in the NPS will become requirements of a DCO.

- Paras 17.1.10 to 17.1.12 – refer to a suite of transport modelling tools being used to inform development of the Surface Access Strategy, the Transport Assessment and other assessments such as the Air Quality and Noise Assessments. The modelling work is therefore a critical piece of work that needs to be as robust as possible in its development and implementation. It is vital that key stakeholders from a range of interested parties, including those that are most likely to experience

negative impacts as a result of the 3rd Runway going ahead, are included in its development.

- Para 17.1.13 – It is stated that the activities specifically being undertaken to develop the Surface Access Strategy "are not covered within this chapter. The development of the Surface Access Strategy will be discussed separately with key stakeholders as it emerges". This approach is not considered to be appropriate. This is a critical part of the Strategy and should be set out in detail.

- Para 17.1.14 – It is stated that a Transport Assessment is to be produced to assess impacts on the surface access network of the 3rd Runway "considering both construction and operational aspects". It should be noted that there is the possibility that additional capacity will be created at Heathrow before the 3rd Runway is fully operational and therefore there will most likely be a phase that could be characterised not just as a "construction" or "operational" phase, but one where both "construction and operation" will be occurring, so this is a scenario that will need to be covered in all work carried out to assess traffic and transport impacts.

- Para 17.1.15 – It is stated that the Transport Assessment will be produced in parallel with the EIA on traffic and transport impacts. This raises the concerns that issues identified in the EIA process will be missed in the Transport Assessment. In our view, the EIA process should be carried out first, completed, be reviewed and consulted on by all stakeholders and revised where necessary before the project moves onto the next step of developing the Transport Assessment (and presumably the Surface Access Strategy as well).

- Para 17.1.16 - should "volume of traffic" be added as a new and separate evaluation criterion as research seems to bear out the deleterious effect on human health resulting from the volume of motorised traffic on human health? One issue we are experiencing is that since the growth of on line mapping systems, apps and all forms of GPS the through movement of vehicles is rarely confined to A or B roads and is often routed through unclassified roads within the heart of our residential communities. Any attempt to model this needs to go beyond the historic methods of modelling capacity on arterial roads.

<u>Policy and Legislation</u>

- Table 17.1 needs to be updated with the details of the adopted Airports NPS. Only the Airports NPS and the National Networks NPS are listed here, so for a summary of all policies/legislation relevant to the traffic and transport assessment chapter in the EIA, it seems a bit lightweight. The Government's 25 year Environment Plan is mentioned as a footnote to the Table. This is very disappointing to see and it should be considered and summarised in more detail. Also, passing reference is made to local policies. It would be helpful if these were also reference

fully and summarised so it is clear to all parties that the correct policies are being considered.

The local transport policy document of the Borough is our Local Implementation Plan (LIP) which needs to demonstrate compliance with the Mayor of London's Transport Strategy (MTS). (Sections 42 and 142 of the GLA Act refer). The (latest) MTS was published on 13 March 2018 and Boroughs now need to produce new LIPs (our third LIP). Our current LIP "(LIP 2") dates back to 2011 and therefore is quite dated. (Our current LIP states that "We welcome the government's decision to cancel the proposed third runway at Heathrow but there is still scope for an increase in passenger numbers at the airport.)" There is guidance to Boroughs on production of their new LIPs of which the following sets out part of the context:

"The Mayor's Transport Strategy

1.1 The third Mayor's Transport Strategy sets a new strategic direction for transport in London. It puts health and human experience at the heart of the transport system, looking not only at how transport infrastructure helps London's residents to get around, but at how the way people get around impacts on what London is like as a city.

1.2 Key to achieving the vision set out in the Mayor's Transport Strategy is the Healthy Streets Approach. The new strategy presents a unique opportunity for the boroughs, the Mayor and TfL to work together to improve the lives of people living in, working in and visiting London. By reducing traffic and creating streets and neighbourhoods that are attractive and pleasant places to walk, cycle, use public transport and spend time, London's authorities can make real improvements to the quality of life of everyone who lives in, works in and visits the city."

This approach needs to guide the Traffic and Transport Assessment.

<u>Stakeholder Engagement</u>

- Para 17.3.1 – Reference is made to undertaking stakeholder engagement on development of the EIA traffic and transport chapter. To our knowledge, this has not involved H&F to date. Whilst we acknowledge the need to engage early with key organisations such as TfL and Highways England, we see that there's no passenger or transport user groups that have been involved so far. We have concerns about EIA being developed in detail whilst only listening to input from just strategic level stakeholders. This view is reinforced by the comment in Para 17.3.2 that the aim of this engagement has been to identify the various elements required for an effective Surface Access Strategy that caters for both passengers and colleagues etc. Yet, there doesn't appear to have been any engagement with these groups. Also, we are not clear what "colleagues" is a reference to in this context. If this refers to Heathrow employees then that would be a better way to refer to this group of transport users.

- Para 17.3.3 - Considering that discussions have apparently also begun on the assessment of environmental effects related to transport which includes discussions with Highways England, The Heathrow Strategic Planning Group (Transport Sub Group), the Heathrow Area Transport Forum and TfL, we are concerned at the limited nature of the stakeholders involved so far (i.e. no environmental or community group representation) and we would expect that stakeholders from these wider groups will be involved ASAP in the EIA process.

Study Areas

- Para 17.4.2 – The Highway study area is of particular interest to H&F as we want to make sure that impacts in our borough are assessed and not ignored. Although reference is made to Fig 17.1 showing the geographical area of the Study Area, this figure is not present in the Chapter. H&F has 2 key through routes (the A4 and A40) used by traffic travelling to or from Heathrow. We would therefore like to see a map of the geographical area covered by the Study Area. We are concerned that if it is the "Heathrow Highway Assignment Surface Access Model" that is being used to develop the Study Area, that this will focus on the immediate vicinity of the airport and not further afield.

- Para 17.4.3 - Passing reference is made to how the model will evaluate how the highway network will accommodate the forecast demand. We have not yet found any information on how these demands will be forecast. This is a critical aspect of the assessment and details of how this is to be determined should be provided.

- Paras 17.4.3/17.4.4. – note that effects outside of the 2 areas that will be modelled "can be assessed if necessary". Further details should be provided on the circumstances under which it would be considered to be appropriate to do this.

- Para 17.4.5 – Reference is made here to a 3rd Runway scenario of 140mmpa and 115,000 colleagues. This is not clear and needs further explanation. It should also be clarified if this scenario represents the maximum capacity and impact that a 3rd Runway would have. The use of the 5% threshold as the proportion of increase in trips that creates significant impacts is not considered to be appropriate for all road networks at Heathrow and in and around the surrounding area (including H&F) and a lower threshold should be used for the strategic road network where traffic flows are at their highest. This would reflect the "precautionary approach" that is supposed to be followed (according to the text in this paragraph). Also, presumably there are roads where there could be a disproportionate impact from HGV traffic (this may be relevant for H&F roads) which may be a factor at a level below the 5% overall threshold. The 5% / 10% thresholds suggested for use were used in guidance on Traffic Impact Assessments (TIAs) in the 1990s at least – and were widely used for considering the need to carry out detailed TIAs. These criteria were used by local authorities to

determine whether modelling was required of specific junctions, for example, as a result of increased traffic from proposed developments. TIAs were replaced by the idea of more holistic transport assessments and it's debatable how much, if any, reliance can be placed on these figures for the proposed 3rd Runway. It seems perfectly reasonable to make a "First Principles" argument that arbitrary (and dated) thresholds should not be used to determine the extent of modelling where there are concerns outside of the area defined in the scoping report, particularly in the context of already heavily congested networks.

- Para 17.4.6 – The EIA should not just focus on locations where the greatest changes in traffic flow occur. There may be locations where there are lower levels of changes but which could also have significant impacts. We consider that it is too early at this stage to start excluding locations from inclusion in the EIA assessment, particularly when considering the issue of the potential growth in HGV traffic that could occur on strategic routes and therefore impact disproportionately on these locations (which would include H&F).

- Para 17.4.7 - Uncertainty issues are mentioned briefly in relation to the modelling. These should be summarised (as should how they will be addressed) in the text at this point rather than referring to the separate Appendix document for further details.

- Para 17.4.8 – It is not clear how the reference in this paragraph to a threshold of a 30% increase in flows triggering the need for assessment is consistent with the 5% increase in trips threshold that has been referred to in Paragraph 17.4.5. This needs to be checked and clarified. The HGV flow exceedance threshold at 10% is also considered to be potentially too high and needs further consideration.

- Para 17.4.9 – refers to the use of Railplan to model public transport network impacts. This will be used to determine the study area for the assessment of various impacts. This implies that the Study Area for the assessment has not yet been determined although this is unclear as there is reference to Figure 17.2 showing the extents of Railplan. More clarity on the study area is required. It is not understood why the study are for public transport impacts has not been set (if this is indeed the case) , but the study area for highways impacts has already been decided.

- Para 17.4.10 - states that services which are identified through modelling to experience delay or other issues would be assessed further. How will the modelling be verified?

- Para 17.4.11 - the levels of impacts on public transport that will be considered to be acceptable or not have yet to be determined and suitable thresholds for assessment have not been determined. This approach is not consistent with that taken with the Highways Study and

this is not understood. Further explanations should be provided so it is clear to stakeholders why this is the case.

- Para 17.4.12 – Reference is made to changes in flows, capacity or delays and the magnitude of these changes determining where assessment will be carried out but there is no information on what sort of change thresholds will be considered to be appropriate. Further information on these matters should be provided.

Sources of Data Used

- No comments on this section.

Baseline Conditions

- Paras 17.6.2/17.6.3 – it is surprising that the baseline conditions in terms of the congestion that is identified on many of the roads around Heathrow (which include the 2 strategic roads that run through H&F (the A4 and A40), are only discussed in broad terms and with no quantification. Presumably there is data available that shows exactly how bad the congestion levels are on these roads. This information should be provided. We shouldn't simply be looking at congestion issues when considering impacts to human health.

- Para 17.6.4 – Information on the various rail services at Heathrow is provided. No information is provided in terms of passenger numbers or capacities or levels of overcrowding. The only underground line mentioned is the Piccadilly line. Clearly passengers using Heathrow use other lines as well, so shouldn't the assessment cover the wider London Underground network, not just the Piccadilly Line? It should also mention the planned service patterns when Crossrail (Elizabeth line) opens in 2019.

- Para 17.6.9/17.6.10 - Although reference is made to the parking capacities, there is no information on trip generation which is the key data here. This should be added into this section.

Likely Significant Effects & Effects Not Requiring Assessment and Proposed Approach to the Assessment

- No comments

Proposed Approach to the Assessment

- Reference is made in this section to using desktop research and site observations to collect baseline data on a range of transport services. Local authorities would also be a good source of information and should be included.

- Para 17.9.7 – Although 2016 is set as the baseline year it is stated that more up-to-date information may be used where available. Care needs to be taken with this approach otherwise there could be confusion about the data being presented.

- Para 17.9.8 – Disappointingly there is no information on the construction methodology and its potential impacts so assessment years for these impacts cannot be set out. This information should be provided ASAP.

- Para 17.9.9 – Operational baseline years are proposed to be 2030 and 2040. As commented earlier, there needs to be at least one year where there is a construction and operation scenario. It is not clear when the operations at Heathrow would meet peak levels, so additional assessment years may be required. Also, why does the assessment stop at 2040?

- Para 17.9.15 – It is noted that Community Severance is referenced in this section on assessment criteria. This is welcomed, although it appears that this issue was not referenced in the earlier sections of the Chapter where assessment criteria were being listed, so updates should be carried out to ensure that community issues such as this are flagged up throughout the chapter.

- Paras 17.916-17.9.21 – this section covers some of the same information that has already been covered in earlier sections. As already highlighted, we have concerns about the outlined approach and are concerned that locations are at risk of being scoped out of the assessment too easily.

- Para 17.9.29 – It is noted that where a change in character of a road is expected that the likely impact will be considered using professional judgement in conjunction with existing data. Where professional judgement is used, this needs to be clearly explained.

- Para 17.9.30 – there is another reference to the use of “professional judgement” in this paragraph. As stated above, where this approach is taken it needs to be clear that this has happened and the approach clearly explained and justified.

- Para 17.9.32 – We see that the list of receptors does not include communities that could be impacted by severance issues. Given what was stated in the section on Assessment Methodology, this receptor should be added to the list.

- Tables 17.4 and 17.5 – These present similar but different information in relation to assessing the significance of effects. It is not clear if just one of these approaches is to be used or a combination of both.

- Para 17.9.37 also says professional judgement will be used in assigning significance. As before, wherever this approach is taken, it needs to be clear how decisions have been made.

Approach to Mitigation

- Para 17.10.1 – The mitigation assessment needs to take account of how measures intended to provide a benefit in one area could create negative impacts in another. For example, it is stated that workers will be discouraged to travel by road and encouraged to use public transport. This may be of benefit in terms of road network impacts but could cause negative impacts such as overcrowding at peak times on public transport. These impacts need to be covered in the assessment. It is presumed that the mitigation approach during all phases will be fully quantified so that it is clear what impact the proposed mitigation measures will have. An assessment of what impacts will remain even with mitigation in place should also be provided.

- Para 17.10.6 – It is stated that the Surface Access Strategy will set out proposed initiatives for managing surface access movements and addressing significant negative impacts. It is not stated, but presumably this will include a fully quantified assessment of the mitigation measures. The Strategy must show how all of the targets and requirements that the Government sets will be met.

- Para 17.10.7 – in terms of the public transport mode share targets, we want to see clear and robust information on how these targets will be met. The same goes for the commitment for “no increase in Heathrow related traffic” made by Heathrow.

- Para 17.10.9 – some more detail – summary information for example – would be useful to see for the 8 key initiatives, including information on proposed actions, target, monitoring indicators etc.

- Para 17.10.11 – Mitigation measures are listed here briefly. There is very little indication of the actions to be taken to achieve these. Additional information should be provided, otherwise this section on mitigation looks too vague.

- Para 17.10.12 – it is stated that the Surface Access Strategy should reduce significant effects through the use of mitigation. However, it seems that there could still be significant impacts in places. The report should identify this potential scenario and outline intended actions in these circumstances.

Comments on Issues Raised at the 27th February 2018 Meeting between Heathrow and the Planning Inspectorate

- Heathrow have stated to the Planning Inspectorate that the Scoping Report is based on the options that they consulted on earlier on in the year (Consultation 1). The Scoping Report should focus more on the requirements of the Airports NPS document. However, given that Heathrow have carried out the Scoping Report work proper to the final version of the NPS being approved by Government, this is not possible. This shows the questionable timing of submitting the report at this time. The Planning Inspectorate should have advised Heathrow to wait until the final version of the NPs had been designated before finalising the Scoping Report and submitting it.
- We note that the Planning Inspectorate flagged up to Heathrow the need for the Scoping Report to have due regard to the Inspectorate's Advice note 3 on EIA consultation and notification. Having looked at some of the Scoping Report chapters, we have concerns about the stakeholder and consultation process.
- As identified by Heathrow to the Planning Inspectorate there are a number of areas of the 3rd Runway project where Heathrow have not established final details and wish to proceed on the basis of keeping a number of options open to them in respect of the development. This causes uncertainty regarding how the EIA is to be carried out and there is certainly a lack of detail in a number of the Scoping Report chapters which makes it difficult to understand the potential for impacts or how they will be measures or mitigated. As recommended above, it would have been better for Heathrow to wait until details of the Airports NPS were finalised and published before carrying out the Scoping Report and the Planning Inspectorate should have advised them of this.
- It seems that Heathrow are carrying out their Scoping Report now in order to fit in with their own proposed timetable of works and the 2nd round of consultations that they want to carry out (Consultation 2). There is a danger that the drive to meet these requirements has impacted on the quality and detail of the information provided in the Scoping Report.
- With so many issues still under development in relation to the 3rd Runway, it is possible that further scoping works will be required. If thee Scoping Report had been done at the appropriate time with the required level of information, this would not be necessary. Carrying out another scoping exercise places unnecessary strain on stakeholder engagement and resources, especially when the timescale for submission of comments is so short.
- It is not clear who has been consulted on the Scoping Report. It is useful to stakeholders to know who else has been consulted so we see whether or not the consultation includes all necessary groups etc. This information should be provided. We are interested in knowing whether or not community groups have been consulted as clearly they will be impacted by many of the impacts created by a 3rd Runway that the EIA will be assessing. Therefore they are an important stakeholder that should be involved in the Scoping process.

- Has a description of the role of the CAA in respect of the Airspace Design Process been included in the Scoping Report as advised by the Planning Inspectorate?
- Has a chapter on cumulative impacts been included in the Scoping Report?
- Has a chapter on identifying assessments that overlap with the EIA been included in the Scoping Report?

Comments on Issues Raised at the 28th March 2018 Meeting between Heathrow and the Planning Inspectorate

- We note that the Planning Inspectorate has emphasised the need to use a single consistent definition to describe the DCO site boundaries from which study areas are proposed within the Scoping Report. This is to avoid inconsistent understanding of the full extent of the proposed study area for assessment. We have concerns about the way Study Areas for the various assessments have been determined and described and illustrated in the Scoping Report.
- We note that the Planning Inspectorate acknowledged that as consultation bodies would have only 28 days to review the Scoping Report that it would need to be as concise as possible. We do not consider that the Scoping Report has been presented in a way that is conducive to being able to analyse and assess its contents in the level of detail required. The Scoping Report has been published in 3 volumes and over 2,000 pages. In some cases, information is scattered across these documents rather than all being placed in a single place, making it more difficult to comment on. Vol 1 of the Scoping Report is the main report - 669 pages, but no contents page for the document which makes it very difficult to navigate properly.
- We note that the Planning Inspectorate query the controls to be applied in relation to the age of data. This is an issue we have raised in our comments as in some cases very old data sources (close to 10 years old) are proposed for use.
- The Scoping Report is supposed to explain whether proposed methodologies had been agreed with relevant Statutory Consultees or whether an agreement had not been reached. Although an example of Natural England signing off on data for the biodiversity chapter, it is not clear if this is the case for any other assessment.
- Has a description of the different regulatory and functions fulfilled by the Inspectorate and the CAA been provided in the Scoping Report?
- Has consideration been given in the Scoping Report to the potential for significant transboundary effects to arise from the DCO Project?

HILLINGDON
LONDON

3D Eagle Wing
Temple Quay House
2 The Square
Bristol, BS1 6PN

Via e-mail: HeathrowAirport@pins.gsi.gov.uk

19 June 2018

Dear Sir or Madam

PLANNING ACT 2008 (AS AMENDED) AND THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2017 (THE EIA REGULATIONS) – REGULATIONS 10 AND 11

HEATHROW EXPANSION

Please find enclosed the Council's response to the consultation on the Environmental Impact Assessment (EIA) Scoping Report for the Expansion of Heathrow.

The following is without prejudice to the Council's view that, in all the circumstances, the Secretary of State cannot lawfully make a scoping opinion at this point in the process in any event.

In summary, the Council believes that the Scoping Report is fundamentally flawed, lacking in basic information, premature and frustrates the purpose of the Environmental Impact Assessment Directive. In the circumstances, the Secretary of State could not lawfully consider that he has been provided with sufficient information to adopt a screening opinion.

The Council considers that the proposals for which the Scoping Report relate are entirely premature, speculative and not supported by Government Policy. As a consequence of this the project itself is still undeveloped; the Scoping Report is based on a project that has no clarity and in no way follows the best practice advice of the Planning Inspector Advice Note which states:

> *Applicants should consider carefully the best time to request a scoping opinion. In order to gain the most benefit, Applicants should consider requesting the opinion once there is sufficient certainty about the design of the Proposed Development and the main design elements likely to have a significant environmental effect.*

The Applicant has presented a Scoping Report that is of no benefit to the EIA process as it relates to a project that has absolutely no level of certainty. For example, the Scoping Report presents a significant range of options for the diversion or realignment of the M25 and the A4. These are not minor tweaks to a project, these are fundamental design matters that the Applicant has failed to develop to a point of a meaningful engagement on scoping likely significant effects.

Similarly, the Applicant and the Government have provided no clarity on flight paths; this information is essential to determining where impacts would be and ultimately the likely significant effects i.e. the fundamental purpose of this stage of the EIA process.

There is also a clear disconnect between the Applicant's Development Consent Order timetable and the Airspace Change process (a difference of 18-24 months); given the likely significant noise effects, it cannot be possible to have an accurate and robust EIA process that is not supported by clear a understanding of specific noise impacts. The DCO process should be halted to allow for the two processes to be aligned.

Not to do so compounds the failure, which has been present throughout the Government's process, in so far as communities still do not know who will be impacted, how noisy that impact will be and for how long each day they will be expected to suffer the resulting noise.

Air Quality

The Government's own evidence to date is that a 3rd runway at Heathrow cannot operate without risking breach of AQ limits.

The AQ plan for London does not make provision for an expanded Heathrow.

The Scoping report offers no resolution of these fundamental problems, is based on a misunderstanding of the law and provides no satisfactory method or information to meet these so far insuperable problems.

Poor air quality contributes to thousands of deaths annually in London. It is time for Heathrow airport to take the issue seriously in relation to its current operations and deal with its contribution to illegal and unhealth air pollution in London.

Capacity of west London

Finally, neither the Applicant nor the Government has properly assessed whether the lauded growth of Heathrow Airport can even be accommodated in an already heavily developed and constrained area of west London and beyond.

It is acknowledged that the Applicant is relying on other non statutory processes at undefined points in the future to assess and determine the suitably of all the growth that has been systematically connected to the DCO project. The lack of engagement in the Scoping Report on these wider matters is of serious concern.

Summary

In summary, the Council believes that the Scoping Report is fundamentally flawed, lacking in basic information, premature and frustrates the purpose of the Environmental Impact Assessment Directive. In the circumstances, the Secretary of State could not lawfully consider that he has been provided with sufficient information to adopt a screening opinion.

For avoidance of doubt, the Scoping stage can lawfully only be undertaken when the specific characteristics of the project have been fixed to allow the likely significant effects of the project to be assessed; this must include the determination of flight paths.

Should you wish to discuss further any of the matters in this letter or the following consultation response please do not hesitate to contact me at ithynne@hillingdon.gov.uk

Yours faithfully



Ian Thynne
Team Leader Planning Specialists

HILLINGDON
LONDON

Environmental Impact Assessment Scoping Report
Heathrow Expansion

Consultation

London Borough of Hillingdon
June 2018

General Approach to EIA

1.1. Description of Development

1.1.1. There are a number of failings with the approach of the Scoping Report that renders this stage of the EIA process to be ineffective; these are set out further below. However, it needs to be stated at the outset that the Council is concerned that the Scoping Report fails to meet the minimum requirements of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017/572 ("the Infrastructure EIA Regulations"). Regulation 10(3)states that a person who proposes to make an application for an order granting development consent may ask the Secretary of State to state in writing their opinion as to the scope, and level of detail, of the information to be provided in the environmental statement; and a request for a screening opinion must include:

> *(a) a plan sufficient to identify the land;*
>
> *(b) a description of the proposed development, including its location and technical capacity;*

1.1.2. Figure 3.1 of the Scoping Report identifies the only semblance of description for the project. It annotates a map with a large shade of blue which is simply described as:

> *Land being considered for infrastructure works (roads, rivers, water drainage and treatment); airport supporting facilities; airport related development; and construction sites*

1.1.3. The Council, in which the majority of the development land is situated, cannot realistically understand what is planned or where. The description of development is so vague as to remove the purpose of identifying the significant effects to be considered further in the subsequent Environmental Statement (ES). It also renders it impossible to assist in the confirmation of the necessary receptors to be considered in a subsequent assessment.

1.1.4. We note that the Planning Inspectorate is not content with the Applicant's approach as demonstrated by the minutes from a meeting between the Applicant and the Planning Inspectorate recorded on 27 February 2018:

> *The Inspectorate advised that having options for land use on certain land parcels with the [Scoping Report], rather than a defined end use could lead to uncertainty regarding the appropriate EIA scope of assessment, since the end use might dictate the assessment requirements.*

1.1.5. The minutes continue:

> *The inspectorate suggested that it might be more beneficial to undertake scoping once the options had been narrowed down.*

1.1.6. Evidently this suggestion was not accepted. In response, it is noted that the applicant was recorded as saying:

> *The Applicant stated that the methodologies for assessment of environmental effects are likely to be the same for most options and therefore maintained that was appropriate to seek to agree the methodologies for assessment at this stage.*

1.1.7. The implication of the Applicant's approach is that the Scoping stage is purely to determine methodologies and in that regard, details of the project are not entirely relevant. This approach is entirely contrary to the Planning Inspectorate's Advice Note 7 which states:

> *(4.9) Applicants should consider carefully the best time to request a scoping opinion. In order to gain the most benefit, Applicants should consider requesting the opinion once there is sufficient certainty about the design of the Proposed Development and the main design elements likely to have a significant environmental effect. Applicants should avoid submitting requests with multiple and varied design and layout options. However, if this cannot be avoided and options remain under consideration (for example a number of route corridors associated with a proposed linear development), Applicants should be aware that this may affect the ability of the Planning Inspectorate and consultation bodies to provide detailed comments. In addition, should a high level of uncertainty remain around key design elements of the Proposed Development this is likely to limit the Planning Inspectorate's ability to agree to scope out aspects/matters to enable the refinement of the ES*

1.1.8. The Applicant has set out the extent of options for the project at chapter 3 of the Scoping Report; these include:

- A runway between 3,200 and 3,500
- Three options for new taxiways
- Three options for a new terminal for an approximate amount of passengers per year
- Two options for the M25 realignment
- Four options for the new route of the A4
- Four options for the diversion of the A3044
- Four options for the replacement of a major connecting road junction at Stanwell Moor
- Five other significant traffic interventions depending on the outcome of other options
- Four options for the realignment of various rivers

- Extensive unidentified proposals for various airport related uses
- Various options for water treatment including extensive refurbishment of an existing facility

1.1.9. Many of these options, for example the M25 realignment, are EIA Schedule 1 developments in their own right; some of the others are Schedule 2 development and likely to have significant environmental effects requiring EIA. The Council is effectively being asked to provide assistance on identifying likely significant effects of dozens of options, the scale of which are EIA development in their own right; further, many of these options are interconnected increasing the combination of effects; finally, self evidently the majority of these options would not be delivered.

1.1.10. In turn, it is impossible to determine likely cumulative effects needing to be assessed, the interrelationship of effects or what and where receptors might be to determine the baseline approach to the assessment.

1.1.11. The Planning Inspectorate advice on Scoping submissions (Advice Note 7) addresses this point clearly:

> *An effective scoping process should enable the refinement of the assessment and ultimately the information required to form the ES. If done well, it allows for an early identification of the likely significant effects applicable to the EIA Regulations (in particular Schedule 4) and also provides opportunity to agree where aspects and matters can be scoped out from further assessment.*

1.2. Public Consultations

1.2.1. It is also noted from Advice Note 7 that there is encouragement of early stage consultations with the public to assist in the refinement of options.

> *(4.8) Prior to submitting a scoping request, Applicants may choose to undertake their own non-statutory consultation with the consultation bodies, or others. This might allow for refinement of options prior to making a formal request. For example, Applicants may choose to consult on preferred sites or solutions.*

1.2.2. The Applicant has undertaken a public consultation but what relationship that has to the proposals set out in the Scoping Report remains uncertain. Given the extent of unrefined options still being presented, the consultation has been of little merit, and the application for a scoping opinion has been made far too early in the process.

1.3. Cumulative Effects - HS2

1.3.1. The Council is unclear from the Scoping Report how the cumulative effects of certain environmental impacts will be taken into account in the final assessment. The proposed expansion will have serious impacts across large areas which are interconnected with existing impacts. For example, High Speed 2 will cross the Colne Valley north of the proposed Heathrow Expansion yet there appears to be no reference in the Scoping Report to the impacts of the significant severance through valley at two vital points; one by the largest rail viaduct in England, and one by the proposed third runway.

1.3.2. The Colne Valley is effectively one long interconnected wildlife corridor which also supports the West London Waterbodies designated sites.

> ***The Council recommends that the Applicant includes clarity as to the treatment of the cumulative effects of their proposals alongside HS2.***

1.4. Cumulative Effects - Luton Airport

1.4.1. The Council has received notification that London Luton Airport Limited intend to submit a DCO application in 2019 for the expansion of Luton Airport. The implications of Luton expansion coming forward alongside Heathrow expansion need careful consideration, not least because the air space will be shared. Similarly, the cumulative impacts of Heathrow Expansion alongside RAF Northolt needs clarity; there is no reference in the Scoping Report as to how the RAF base, which accommodate commercial aircraft, will be considered in the ES.

1.5. Cumulative Effects - Lakeside Energy from Waste

1.5.1. The Scoping Report provides limited details on the loss of the Lakeside Energy from Waste Plant:

> *Once a preferred site has been identified and the planning and business case agreed, a standalone planning application could proceed in advance of the DCO application. A key part of facilitating this will be early dialogue with the appropriate Local Planning Authority and consultation with local people on the proposals*

1.5.2. The Applicant should provide clarity as to what the contingency is in place should a site for a major energy from waste plant not be found, or planning permission is not readily secured.

1.5.3. As matters stand, there is no reason to divert from a reasonable worst case scenario of a

closure of the Lakeside plant with no replacement identified. The Council expects a subsequent Environmental Statement to be based on this scenario unless there is a clear ground for an alternative, i.e. a planning permission is in place.

1.6. Habitats Regulation Assessment (HRA)

1.6.1. There is a lack of clarity as to when an Appropriate Assessment relevant to the Habitats Regulation will be carried out. The National Policy Statement concluded:

> *To address the uncertainties inherent in a strategic level HRA, and to most helpfully inform the project level HRA, this AA has proposed a suite of avoidance and mitigation measures to be considered in further detail as part of the project level HRA. At this stage, it is considered that the effective implementation of the proposed suite of avoidance and mitigation measures may help to address the identified adverse effects on European Site integrity. However a more detailed project level HRA is required to reach conclusions that are in accordance with the requirements of the European Habitats and Birds Directives and domestic Habitats Regulations. (12.2.2 - HRA for NPS)*

1.6.2. Matters relating to the HRA should have been properly dealt with through the NPS, however, it seems the issues have been deferred for the project to address in detail. The Scoping Report implies that the Secretary of State will undertake the Appropriate Assessment based on information they provide:

> *In order to facilitate the Secretary of State in making their decision, Heathrow are required to provide the information required for an assessment to take place. The information to be provided by Heathrow will follow that outlined in Advice Note Ten.*

1.6.3. The Appropriate Assessment undertaken for the NPS states:

> *Given the uncertainty surrounding flight paths and flight heights at this time, and perhaps even more so, a general lack of broader scientific understanding of the effects of aviation disturbance to waterbirds, the precautionary principle requires the assumption that any further disturbance effects would be likely to result in cumulative disturbance to the interest features of the site. As such an adverse effect on the sites integrity cannot be ruled out.*

1.6.4. A far more robust appraisal is needed to satisfy the Appropriate Assessment requirements. However, it is not clear what the process is for the submission of this, how this will inform a subsequent Environmental Statement and when it will be completed. We also query

whether there has been a lawful approach to this issue following the judgment of the European Court of Justice (Seventh Chamber) on 12 April 2018 in Case C-323/17/

1.7. Approach to Defining Significance

1.7.1. The Scoping Report is unfortunately not advanced enough with regards to defining significance. A determination of significance is generally in line with the following calculation:

Magnitude of Impact x sensitivity of receptor = Significance of Effect

1.7.2. The Scoping Report provides an opportunity to determine how the magnitude of impact will be determined; for example any decrease in air quality already exceeding minimum standards for health will be a 'high' impact; similarly, it provides the opportunity to determine the sensitivity of the known receptors prior to an assessment for example in terms of air quality residential receptors will be considered highly sensitive.

1.7.3. Determining the criteria ahead of the assessment reduces the likelihood of concerns at the subsequent assessment stage where the focus of attention will be on the evidence and collation of data and the conclusions reached.

1.7.4. In this instance, there has been an incomplete identification of receptors, sporadic attempts to assign magnitude and no attempt to assign sensitivity to those receptors that have been identified. PINS Advice Note 7 states Scoping Requests should include:

> *aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect e.g. criteria for determining sensitivity and magnitude;*

1.7.5. The Community chapter identifies a range of receptors in figure 9.2.2 none of which have been assigned a level of sensitivity; it is not possible to determine how the subsequent assessment will treat for example, the Little Harlington Playing Fields in relation to Harlington Open Space. The same problems appear across all the chapters.

1.7.6. It is assumed that this failing has resulted in the urgency to get to this stage; for example there has been no interrogation of the facilities being used, whether these are of significant importance to communities (i.e. their usage cuts across a large area) or whether they are simply a local resource of limited usage. The level of work to undertake a proper and meaningful Scoping Report is extensive; it is disappointing that one of the highest profile infrastructure project fails to apply best practice and adopts the bare minimum of standards.

1.7.7. The failings will only escalate the likely scale of problems at the assessment stage and ultimately impede and hamper any subsequent DCO hearing.

1.8. Baseline

1.8.1. It is not clear from the assessment topics how growth has been factored into the subsequent assessments. For example, a flight path may have 'x' number of people under it now, but in the future this might (or might have) increase(d) to 'y'. The impacts of the airport on the future demographics are essential to understanding its long term impacts.

> ***There must be a clear approach to population growth and this needs clarification now.***

1.9. Geographical Scope

1.9.1. The Community and Economics Chapters identify two study areas, the 'inner study area' and the 'wider study area'. The inner study area is described as:

> *The most local effects of the DCO Project on communities will be related to the displacement of (and changes to access to) homes, businesses, community facilities (including sports and leisure facilities) and publicly open recreational spaces and routes. The inner study area is defined as the area in which these local effects may occur, noting that there is a slight difference in the study area for the community facilities (including sports and leisure facilities) and recreational spaces and routes as explained further...*

1.9.2. The assignation of the inner study area prior to the fixation of a project (including flight paths) is premature. The direct impacts of the proposals relate to much more than just the loss of land for construction. There will be direct impacts from noise on as yet unknown flight paths and the loss of facilities within the inner study area will have immediate and serious consequences for those outside it; for example the loss of Little Harlington Playing Fields is relied upon as useable outdoor space for many communities north of the inner study area. The Scoping Report states:

> *These community study areas [in the inner study area] are the most relevant for the assessment of impacts on these facilities as they capture the location and characteristics of any home, resident or physical community facility potentially displaced by the DCO Project. (Scoping Report 9.4.9)*

1.9.3. These areas are not the most relevant for the assessment of impacts; the areas likely to experience significant effects are the most relevant. As the Applicant has failed to

interrogate the evidence further, it is entirely premature to reach conclusions on the study area; for example, the Applicant should undertake the necessary level of work to understand the usage of Little Harlington Playing Fields and the area it serves, the scope of study is then set as a consequence of the investigations undertaken. Similarly, the areas directly impacted by flight paths, loss of open space, cemeteries, community facilities should all be given similar weighting to those in the inner study area.

1.9.4. The identification of study areas across the chapter has been ill informed and in some instances it is unclear as to what the being in the study area means for some receptors compared to other being outside.

The identification of study areas can only be confirmed once the project description is known and a complete evidence base on the receptors is available.

Detailed Scoping Response Comments

1.10. Introduction

1.10.1. As set out in the preceding chapter, it is not possible for the Council to provide complete and meaningful assistance on the specific identification of likely significant effects due to the absence of an adequate project description with accompanying maps as well as the lack of information on flight paths.

1.10.2. The following comments on the individual topics will relate to the broad methodologies presented. Likely significant effects not addressed specifically have been raised **but this is without prejudice to the identification of further issues when a more complete understanding of the project is known.**

1.11. Biodiversity

Study Area

1.11.1. The Council is concerned about the study area identified within Figure 6.1 and described in the Scoping Report:

> *The study area for biodiversity, is based on the maximum amount of land being considered for the full range of options which could form part of the final DCO Project taking into account all options presented (6.4.1)*

1.11.2. It is premature to refine a study area when one of the most significant impacts of the airport, the flight paths, is not known.

1.11.3. Furthermore, there appears to be little appreciation for indirect impacts potentially causing significant effects. Large areas of land to the south of the borough will be sterilised, either through construction impacts or through noise. This will effectively push users of green spaces in these areas to non-sterilised sites (including designated conservation sites) thus increasing the footfall and potential harm to biodiversity not within the arbitrarily identified study area set out in 6.1.

Need for Robust Assessments

1.11.4. The Scoping Report relies on the approach of no net loss to offset any harm. However, this should not be at the expense of robust appraisals clearly identifying the harm. For avoidance of doubt, assessments must be of the project without mitigation and then

reviewed once mitigation is factored in; the specifics of the mitigation must be known and it would be inappropriate to simply rely on a theoretical delivery of no net loss; the practical implementation, i.e. the specific schemes to achieve this, must be included in any subsequent assessment.

Relocation of mitigation for Terminal 5

1.11.5. The Council is concerned that some land identified in Figure 6.1 was mitigation for Terminal 5 and previous airport expansion. Simply removing this and placing it somewhere else will not be mitigating the harm of the third runway proposals; it will be simply relocating the last lot of mitigation.

1.11.6. The Assessment must identify the land provided for mitigation as a consequence of the Terminal 5 permission; in turn it must detail how this is factored into the mitigation for the third runway. It must not be 'double counted', i.e. to rely on it as mitigation for Terminal 5 in perpetuity and then again to offset the harm of the third runway.

1.12. Carbon

1.12.1. The carbon emissions from the construction and operation of the development must be considered cumulatively alongside all the expected ancillary development.

1.13. Community

Undefined sensitivity

1.13.1. It is not clear how significant effects will be determined. Table 9.7 sets out subjective criteria for determining magnitude of change for community and table 9.6 sets out subjective criteria for sensitivity to change. It is not clear how these two will be used to determine significant effects.

1.13.2. Furthermore, it is not clear what degree of sensitivity has been assigned to the identified receptors.

No Baseline Data

1.13.3. No baseline data on the receptors has been produced and therefore the Council is unable to provide comments on how these should be considered in the ensuing assessment.

Long term effects

1.13.4. The Council is concerned that the Community chapter fails to address the implications for facilities that are not removed or severely affected as a consequence of the proposals. For example, there is a strong likelihood that Little Harlington Playing Fields will be removed or constrained by noise as to be entirely unviable. This will deprive communities north of the inner study area a well used facility placing greater strain on facilities elsewhere. It is not clear from the baseline position whether any consideration will be given to communities outside the inner study area who will directly lost facilities within. The impacts on wider communities must be captured by the subsequent assessment

Study Areas

1.13.5. The Council cannot agree to the scope of the assessment as the project remains vague and undecided. Impacts on existing communities and their facilities will be experienced far and wide as a consequence of traffic impacts, noise from flights and ancillary development.

1.13.6. It is impossible to determine the scope of the Environmental Statement without a clear understanding of what the project is.

1.14. Economics and Employment

1.14.1. The Council remains unconvinced that the lauded economic growth as a consequence of Heathrow Expansion is properly understood by those making the claims. In the past 5 years there has been a variety of claims about the extent of employment growth as shown in the table below:

	Report	New Job Numbers	Year	The scope of growth (quoted from document)
1	**Original Final Airports Commission (2015)**	59 - 77000	2030	At and around the airport
		75 - 78,000	2050	Direct, indirect and induced
2	**Further Sensitivity Review - DfT October 2016**	37,740	2030	Local Jobs
		39,100	2050	Local Jobs

3*	**NPSv1 Feb 17**	37,740 - 76,650	2030	Local Jobs
		39,100 - 78,630	2050	Local Jobs
4**	**NPSv2 Oct 17**	57,000 - 114,000	2030	Local Jobs
		39,000 - 78,000	2050	Local Jobs
5	**Heathrow 2018 Consultation Document**	Up to 40,000	Not given	In the local area
		180,000	Not given	Across the Country
3* - The official figures used in the NPS were essentially reporting the range from the two previous reports. 4** - Heathrow expansion was less economically viable than Gatwick for the second NPS consultation in October 2017. However, Heathrow was preferred because it offered benefits quicker but would then reduce to levels previously reported				

1.14.2. As can be seen, there is obviously no coordinated understanding of how to measure and forecast growth. The Scoping Report should, but doesn't, set out clearly how the subsequent Environmental Statement will identify likely significant effects through the presentation of the methods to be used. Unfortunately, the Scoping Report provides no clarity:

> *The detailed assessment methodology will be agreed with stakeholders during future engagement and response to scoping. (10.9.4)*

1.14.3. Clarity as to the methods for determining the growth needs to be provided . Employment growth relates directly to housing growth and a range of environmental and community effects that need consideration.

1.14.4. The employment growth from the operational impacts of the airport is entirely unclear. Similarly, the consequences from construction are also unclear. However there will be a likely significant effect from the loss of housing and employment uses south of the M4 as a consequence of the project. The implications for this must be fully assessed.

1.15. Historic Environment

Study Areas

1.15.1. This section divides the study areas into a core study area (Fig. 11.1) and a wider study area. As set out above, study areas are not possible to define yet until flight path data is understood clearly, as well as the direct and indirect impacts from the countless project options still to be developed.

Sources of data used in scoping

1.15.2. The Historic England National Heritage List for England is named as a data source, although this is useful in identifying designated heritage assets, their grade and location, they are often extremely brief and not sufficient to establish significance. The heritage assets that are directly affected by the proposal need to be assessed at a much deeper level. The Historic Environment Record should be on this list as the NPPF 128 states that this should be consulted as a minimum requirement in order to ascertain significance. Given the nature of the project, the Council would expect a much greater degree of understanding of the historic environment, particularly with regards to those features to be demolished.

1.15.3. The baseline surveys to date include a high level walkover survey of the areas concerned. It is noted that there has only been an informal review of two interiors, Harmondsworth Church and Harmondsworth Great Barn. While undoubtedly important all the interiors of the listed buildings in the immediate vicinity of the proposed site should be visited in order to understand the proposal's impact.

Baseline conditions

1.15.4. The baseline data collected to date is laid out in Appendix 11.2. This is sufficient to identify the designated assets affected but again would reiterate that those designated assets which are most directly affected should be highlighted.

1.15.5. However, relying on Historic England's NHLE will not in most cases be sufficient to establish significance. A detailed Heritage Statement should be drawn up for each listed building affected.

1.15.6. It is noted that the chronological overview (11.6.11-19) jumps from the 12th and 13th centuries to the 19th and 20th century urban developments. This is to ignore the core centuries between the 14th and 18th centuries when many of the heritage assets affected date.

1.15.7. The report states that baseline data on non-designated heritage assets will form part of the historic environment assessment. This is welcome but it is not clear as to why locally listed buildings have not been included at this stage. Information is readily available on the Hillingdon heritage asset maps available publically.

1.15.8. No mention is made of Areas of Special Local Character in the report. These should also be included within an historic environment assessment.

Determining Significance

1.15.9. The Council disagrees strongly with the applicant's definition of significance:

> *as the sum of the heritage interests that a heritage asset holds is referred to as significance (11.6.20)*

1.15.10. The assessment should align more closely to the definition laid out in the NPPF

> *The value of a heritage asset to this and future generations because of its heritage interest*

1.15.11. This is a nuanced difference but nonetheless important if the correct assessment is to be made of significance.

Effects not requiring assessment

1.15.12. The Council has significant problems with trying to establish the scope of an assessment of a project not yet developed. It must also be noted that the cumulative impacts of the ancillary development must be considered, and given this remains unclear then it's not possible to determine the scope of the study.

1.15.13. It is also noted that in the wider study area only the operational effects will be studied and the Report states:

> *it is therefore proposed that in relation to heritage assets in the wider study area assessment is limited to operational effects and only in relation to heritage assets considered sensitive to changes in noise levels and vibration. (11.8.1)*

1.15.14. There can be no assessment until the flight path data is available.

Proposed approach to the assessment

1.15.15. Paragraph 11.6 states that non-designated assets will be included in a subsequent assessment:

Baseline data on non-designated heritage assets will be incorporated as part of the detailed baseline studies and non-designated heritage assets will form part of the historic environment assessment, both as described in Section 11.9

1.15.16. However Section 11.9 makes no direct reference to non-designated assets save for an unclear footnote which states:

If specific intelligence is available on non-designated heritage assets that warrant consideration they can be included within the scope of the assessment without the need to modify or amend the methodology.

1.15.17. Given the comments at 11.6, the approach to the assessment at 11.9 for non-designated assets makes little sense. For avoidance of doubt, the Historic Environment is made up of designated and non-designated heritage assets. The subsequent historic area assessment must include detailed analysis on the impacts across the whole of historic environment. The Cumulative impacts on non-designated assets will devalue the historic environment and this must be fully appraised; this can only happen once a clear record of the non-designated assets is properly understood.

Figures

1.15.18. The initial overview figure, although necessary to identify the core area, combines so many heritage assets that it is not overly informative. Despite the assets identified, there are no non-designated assets included. It will be necessary to include non-designated assets on the maps and if an inner core area is defined, as suggested above, there should be a map showing in great detail all the heritage assets affected with an overlay of the proposed runway. Without this the maps are not informative.

1.16. Health

Unclear Assessment Methodology

1.16.1. A significant failing of the Scoping Report is that it fails to clearly set out how impacts will be assessed. This is particularly prevalent in the Health section in relation to noise. It is not clear how the applicant will describe the significant effects related to health or what methods will be used.

1.16.2. There is now a specific requirement in the EIA Regulations to consider the risks to human health from a development. Previous attempts to simply identify annoyance as a health effect associated with aircraft noise would not be satisfactory under the new Regulations.

1.16.3. Noise and health are essential to the assessment of effects but there is no agreed approach to assessment and these needs to be done.

1.16.4. Similarly, for the other topics the approach to identifying health effects is unclear. The applicant would be expected to present the studies they intend to rely on in relation to health and how these will inform the methodology. Likely health effects will come from many sources, loss of housing, loss of communities, loss of jobs, air quality, noise, loss of access to open space, construction impacts, flood risk increases and so on.

1.16.5. The approach to the health assessment is not adequate. There is no clarity as to how the applicant intends to arrive at conclusions. Table 12.6 has a column titled methodology, presumably to set out how the assessment will be conducted. Instead it provides a very vague overview. For example, in relation to Living conditions: Relocation and change in living conditions for those being relocated, a fairly important subject as a consequence thousands of people being required to leave their homes, it states:

> *The methodology will draw on the outputs of Chapter 9: Community and identify the number of people likely to be subject to compulsory acquisition. A review of evidence will identify the likely positive and negative impacts that could be expected to be experienced by the population, including vulnerable groups. An overview of the local demography will provide inputs to the assessment of types and numbers of people affected. The methodology will consider the existing mitigation measures (property schemes, compensation, hardship schemes and assistance in relocation).*

1.16.6. The above refers to 'the methodology' as if this will be determined at a later date. It also identifies vulnerable groups without definition; the local demography without explanation; and a review of evidence without disclosure.

1.16.7. In simple terms, it is not clear from the Scoping Report how health effects from the airport will be determined. This is a significant failing.

1.17. Health Facilities and Providers

1.17.1. Given the likely significant health effects from noise and other topics, the Council would also expect any environmental statement to consider the impacts on the health service facilities and providers in the areas impacted. These have not been identified, baseline data not provided and appears to have been omitted.

1.18. Noise and Vibration

1.18.1. The methodology for identifying significant effects is unclear. There is a distinct lack of clarity as to how LOAEL and SOAEL and have been informed by information on health and in turn these will inform significant effects.

1.18.2. It is also disappointing to note:

> *The LOAEL and SOAEL values to be used in the assessment of likely significant effects, as referred to in Table 16.7 have been informed by a review of policy, standards, scientific evidence and previous projects. This evidence review will be published as a separate Technical Report on 'adverse effect levels' to accompany the PEIR.*

1.18.3. It is unclear why this technical report has not been presented with this Scoping Report since this appears to be the most suitable place to understand the methodology for assessing significance. Indeed, there appears to be no obvious clarity as to how the applicant has reached the conclusion on SOAEL. Hiding the evidence base to justify the decision is plainly incompatible with the purpose of the Scoping Report stage.

1.18.4. The noise chapter is one of the longest in the Scoping Report but the crucial parts of understanding the methodology are missing i.e. what evidence base will be used, what studies will inform significance and how will LOAEL and SOAEL be used.

1.18.5. Furthermore, it is important that subsequent assessment does not become simply a matter of assessing change in noise levels. An updated noise evidence (Survey on Attitudes for Noise 2017) has revealed that there would be many people currently impacted by noise and suffering significant effects. Previous studies were based on out of date metrics, and consequently it would not be appropriate to simply assess the change in noise levels.

1.18.6. It would be inappropriate to claim only increases in noise level (i.e. +10dB) will result in significant effects if communities are already exposed to significant effects.

1.18.7. The Environmental Statement must also identify those who are not assisted by forms of mitigation. Previous assessments regarding Heathrow have failed to grasp those changes in runway operation, i.e. switching operations from northern runway to southern runway does not result in respite for all. Some communities are equidistant between the two operations and consequently do not receive the respite claimed.

1.18.8. In general, the Scoping Report fails to provide clarity as to how noise and subsequent effects will be treated in the environmental statement. In particular, there is a distinct lack of clarity

as to how significant effects will be considered particularly at the level of the onset of adverse effects.

1.19. Traffic

Study Area

1.19.1. Given the unrefined nature of the project it is entirely premature to identify study areas or scopes of assessment. It is noted 17.4.6 states:

> *Beyond the boundaries of the AoDM and RoFMA, the increase in Heathrow related trips on the majority of links falls below 5% and are therefore not deemed necessary for inclusion in this assessment. Initially, this is how the study area was determined, however the focus of the EIA will be on locations within this study area which experience a greater change in traffic flow.*

1.19.2. The options open to the M4, A4 and M25 and other supporting roads are not at a stage where the extent of road modelling can be refined. Furthermore, the arbitrary 5% criteria may not be appropriate if some at capacity roads see any further increase.

Significance Criteria

1.19.3. The significance criteria set out in tables 17.4 and 17.5 are too ambiguous to be of assistance. The aim of the Scoping Report is to assist with the specific application of these, instead the Report states:

> *It should be noted that the approach to assigning significance will be based upon reasoned argument, professional judgement of qualified transport planners, assessment of the extent of the traffic flow changes and consulting with appropriate stakeholders.*

1.19.4. This approach does not assist in developing an effective methodology.

1.20. Water Management

Catchment Areas

1.20.1. The surface water catchments identified incorporate the above ground topography which may feature and interact with the airport, however it does not take into account the below sewerage catchment for both surface and foul water. The foul water catchment and associated issues already identified by Thames Water do not appear to have been

considered.

Lead Local Flood Authority

1.20.2. For both HS2 and now Heathrow, the applicants have been inclined to liaise heavily with the Environment Agency and determine their approach to water management with them. This fundamentally ignores the fact that the Environment Agency is just one body responsible for the management of water. The Lead Local Flood Authority has been handed responsibility for flood risk on a range of matters, including groundwater and surface water.

Water Framework Directive Assessment

1.20.3. The baseline assessment is not detailed enough and should include ordinary watercourses and their condition. Further field based assessment and monitoring and surveys are required without reliance on Table 18.1.2. The table also refers to flow gauges but only with regards to main Rivers; this omits a sensitive west to east north of the airport at the Frogs Ditch; this is a strategic spring fed watercourse and needs to be considered further. Evidently, the Council cannot provide full details of the watercourse omitted because the project has not yet been finalised.

1.20.4. There is limited reference to Ordinary Watercourses and the lack of investigative work has resulted in omissions on Figures 18.2 and 18.3 which do not show all of those that have been identified by the Lead Local Flood Authority (LLFA). Their importance in the catchment is fundamental to be included in the EIA. As such the current land use receptors in Figure 14.18 are not detailed sufficiently.

1.20.5. Small ordinary watercourse can be an indicator of the significant water issues in the area, and the water framework directive requires that a holistic approach is taken which considers surface water, groundwater and water dependant ecosystems and their interactions.

1.20.6. Consideration of ordinary watercourses and LLFA data is a necessity for a full understanding of the water environment. They must inform further data collection to provide a baseline understanding that is comprehensive and robust.

1.20.7. There is also a critical need for historic flooding information to be part of the assessment method to determine impacts and should be taken into account.

Determining Significance

1.20.8. As with the other topics, the Scoping Report fails to clearly set out how significance will be determined, or what has been deemed to be the sensitive receptors.

1.21. Water Supply

1.21.1. It is not clear from the Scoping Report how significant effects to and from public and private water supplies will be determined. It is worrying to note that appears the only receptor identified is:

> *Affinity Water maintained assets around the boundaries of the airfield and Heathrow maintained assets on the airfield.*

1.21.2. The development, including the myriad of options under consideration, has the potential to have significant impacts on natural springs, groundwater, man made lakes and other watercourses. It will also have a significant high demand of water.

1.21.3. The Council expects the assessment on water supplies to consider the implications of the airport being in a severely water stressed and the impacts on the water environment as a whole. The assessment must be expanded to all the relevant sensitive receptors, which evidently cannot yet be identified because of the lack of information available from the Applicant.

1.22. Conclusion

1.22.1. The Scoping Report as submitted is not considered fit for purpose. It relates to a project without any certainty, is too undeveloped and directly linked to development not identified.

1.22.2. There is no flight path data rendering it impossible to compile a composite scope of study and identification of receptors.

1.22.3. The methodologies provided are too vague, not project specific and poorly refined.

London Borough of Hounslow

Housing, Planning and Communities

Development Management
London Borough of Hounslow, The Civic
Lampton Road, Hounslow, TW3 4DN

HeathrowAirport@pins.gsi.gov.uk

Your contact: Geoff Hugall
Direct Line: 020 8583 4936
Email: planning@hounslow.gov.uk
Date: 19/06/2018

Dear Sirs,

Re - TR020003

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11 Application by Heathrow Airport Limited (the Applicant) for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the Proposed Development)

I write further to your consultation letter dated 22nd May 2018 requesting comments on Heathrow Airport Limited's request for a Scoping Opinion.

We have had sight of the Heathrow Strategic Planning Group's (HSPG) technical response to the EIA Scoping (attached for information and ease of reference) and would generally concur with its contents and trust that their comments, suggestions and proposals are given significant weight. Notwithstanding that, further comments on specific chapters are set out below –

Chapter 1 –

- Figures should be cross-referenced when describing defined areas throughout the document for ease of understanding
- Table 1- Summary of Scope
  - With regard to the construction phase of the Public Transport we would question the decision to exclude 'Economics and Employment' from the assessment .
- Table 1.2 – Relevant policy documents
  - West of Borough LP Review is an emerging document
  - Add the Great West Corridor LP Review to emerging document

Chapter 5 (Air Quality and Odour) -

- DfT's revised ANPS states that the environmental statement should assess any likely significant air quality effects, their mitigation, any residual likely significant effects, distinguishing between those applicable to the construction and operation of the scheme including any interaction between construction and operational changes and taking account of the impact of the scheme is likely to cause on air quality arising from road and other surface access traffic. However, as there may be different standards for significance criteria, in use by clients and LPAs, we seek clarity as to the significance criteria that should be used for the EIA scoping report?

- In reference to comments within the Aviation Policy Framework (2013), How would Heathrow work differently with LPAs than in the past to improve air quality, as is expected by the Government to take this responsibility seriously, implying as we understand it different approach is needed in delivering the best possible mitigation measures?
- In reference to DfT's 'Beyond the Horizon. The Future of UK Aviation. Next steps towards an aviation strategy 2018', this document states that "Surface transport continues to be the main contributor to local air quality emissions…". How does approach outlined in this document would address projections made in the LAEI 2013, which predicts that emissions from aviation would be twice as high as those from road transport, by 2030? Perhaps, more significant points are as how these impacts will be assessed, to what baseline year and mitigation strategy and measures will be pursued?
- In reference to comments in fourth paragraph "Table 5 Engagement with stakeholders" that states "Model performance will also be evaluated using appropriate diffusion tube data", it should be noted that Hounslow Council has no diffusion tube positioned along A312 section between Jolly Waggoners roundabout and M4, northbound. Besides, it should be noted that air quality model should be verified against a more accurate method than a diffusion tube method as the latter method should only be used for indicative purposes (as a general rule, verification/calibration method/tool should be 10 times more accurate, i.e. an order of magnitude greater than the model, sample under test). Therefore, Heathrow should consider installing a temporary monitor, to establish a true baseline, as discussed at the engagement and subsequent HSPG meetings.
- We consider the study area of 12km x 11km is too small, even when change in air quality due to airfield operations, aircraft and road traffic may be relatively small but yet sufficient to cause new exceedances of air quality objective (AQO) and or delay compliance with the AQO in such areas at the earliest possible date. In the assessment compliance with the EU limit values at additional PCM road links between Heathrow and Central London (5.4.13), it's absolutely critical that a true baseline is established using measured data, rather than relying on Defra background maps that under-predict baseline NO2 concentration levels.
- Reviewing PM10 emission results of Table 5.5, the Council has grave concerns at the lack of progress in annual emission reductions of this pollutant (PM10) and therefore it's corresponding component of PM2.5 at Cranford and Hatton Cross, which are background urban background sites within Hounslow. Therefore, we perceive there is a need for a different strategic approach aimed at reducing particulate and fine particulate concentrations, regardless of whether the source is airfield operations, aircraft and road traffic.
- We anticipate that year of maximum "air quality effects" could be during construction phase when third runway operations commence, however, as construction phase is wound-down, operations are likely to wind-up, which would make it difficult to predict and draw comfort from the fact the emissions in subsequent years will be lower than the year of 3rd runway opening. We also believe the overall effect on air quality on the road network surrounding Heathrow will inevitably depend upon successful delivery of surface access scheme.
- The Council appreciates and understands benefits of role of dispersion modelling particularly when quantifying and identifying sources of pollution (source apportionment), however we believe source apportionment of road traffic using ANPR is one of most accurate ways, which should be undertaken because this is a much more robust method of verifying the ADMS-Roads version of the model.

Chapter 6 (Biodiversity) –

Final documents should take a more simplified/clarified approach to ensure compliance. Please find some comments below, noting that some were addressed but could be improved.

- Details of an effective river monitoring program should be provided, in place over construction and operation time frames. The monitoring program should be comprehensive to detect any impacts to down-stream ecosystems, covering population assemblages, pollutants, etc.
- It is critical that river re-directions are feasible without impacting flow rates across associated river systems. This is important to maintain downstream ecological health, and assist with drainage of potential floodwaters (particularly with increasing severe weather events related to climate change).
- Biodiversity assessments of river impact should not only measure impacts resulting from directly modified areas, but also potential impacts on either side of the airport resulting from breakages in ecological linkage. An adequate ecological contingency plan should be identified, to address any unforeseen ecological impacts associated with river diversions.
- Biodiversity offsetting approaches should not only consider habitat quality/quantity, but also significance of biodiversity linkages in both removed and proposed habitat.
- It should be clarified how the loss of river habitat will be calculated and offset. Biodiversity offsetting is likely difficult to apply for water habitats, due difficulty in measuring various important features, as potential downstream impacts. It is critical to ensure that potential impacts to downstream environments are assessed.
- Although the biodiversity offsetting approach seems effective to assess ecological value of existing habitat, assessment of potential indirect impacts is also important. Such impacts to biodiversity may include increased traffic, increased emissions/pollution, increased travel and business demands, additional flight paths, etc.
- It is important that biodiversity offsets consider species specific recolonisation potential. Habitats with identified high biodiversity potential are not always such for all species, and it must therefore ne ensured that new habitat is suitable for impacted species.
- The development is likely to impact habitat used by designated bat species. Hounslow should be considered for bat habitat offsetting options, as various sites of known presence exist on land to the immediate/proximate east of the airport.
- It would be beneficial to provide more information on how environmental monitoring, biodiversity offset implementation, etc., will be regulated/enforced, including responsible parties at all levels, what baselines/criteria will be used, how progress/targets will be monitored, etc.
- All green space sites important for maintaining biodiversity should be included in measurements, including gardens, allotments, parkland, wastelands and other unlisted vegetated sites. Quantification of total biodiversity impact as a result of the development is critical to meet relevant policy, and the objectives of Biodiversity 2020, and to allow for the adoption of appropriate biodiversity compensation ratios.
- Where used, relative terms such as ‘significant harm’ should be clarified to a measurable extent. Criteria should also be included to indicate when impact minimisation would be considered an appropriate alternative to impact avoidance. Additional information should also be included on what measures may be taken to minimise biodiversity impact when avoidance is not possible (where relevant).
- Further to the point above, it should also be clarified when compensation or offsetting would be an appropriate measure in place of impact avoidance or minimisation.

Chapters 7 (Carbon and Other Greenhouse Gasses) & Chapter 8 (Climate Change) -

The document lacked mitigation detail. Hounslow Council should be consulted for the forthcoming Climate Change Adaptation Plan. Further comments below,

- It must be ensured that site plant, vehicles and site operations are in accordance with relevant sustainability, emission and environmental health standards, and carbon neutral if possible.
- Flood storage requirements should encompass potential increases in rainfall associated with climate change.
- A monitoring program should be in place to ensure that significant emission increases are not apparent due to increased over-ground access. Contingency/regulation should also be proposed, in the event significant emission increases are apparent.
- Aircraft emissions will account for approximately 95% of all current Heathrow related carbon emissions (site operations and travel to/from the airport account for 5%). This proportion is likely to increase with the additional proposed flights, and the increase in carbon emissions will be significant if timely measures are not implemented. Measures for sufficient adoption of fuel-efficient aircraft and sustainable biofuel is critical to achieve the carbon reduction targets set by Heathrow, and UK/EU Legislation, and must therefore be proposed.
- For airport operations, it must be ensured that effective baseline, monitoring and periodic targets are set to ensure carbon reduction is apparent. As above, contingency/regulation measures should also be in place.
- Interim carbon reduction targets are likely necessary. It is often unrealistic, and highly risky, to set long-term targets only. Further, considerable research indicates that imminent carbon reduction action is required to meet UK/EU/Global targets. Scientists warn that it won't be enough for emissions to flatline or decline slowly in the years ahead, and that emissions must fall sharply to reach targets. Scientists state that even a few years of delay could make that task much harder, and the rate of change matters as much as the direction. Even a temporary delay could therefore be hugely consequential.
- Further, is widely agreed that failure to reduce carbon emissions immediately will result in ever-increasing costs and public safety risk associated with the impacts of climate change. 2017 disasters in the USA, for instance, caused a record $306 billion (£220 billion) in damages. Many believe the severity is likely related to human-induced climate change, and that the UK is subject to such impacts.
- Although Heathrow proposes to offset biodiversity loss, much of this will likely occur in already existing greenspace via biodiversity quality improvements. A net decrease in actual green area can therefore be expected as a result of the development. This should be an important consideration, and reason for Heathrow to commit to carbon reduction/climate change initiatives, as green space is critically important for carbon storage, temperature regulation and flood mitigation.
- As water scarcity is a potential impact of climate change, and is detailed as a likely forthcoming issue to London in the London Environmental Strategy, serious efforts should be made to reuse as much water onsite as possible. This will additionally reduce pressure on surrounding infrastructure, Mogden sewer works, etc.
- Flood risk mitigation methods should be aligned within other biodiversity/green infrastructure benefitting-work where possible.

Chapter 9 (Community) –

- There's no mention of traffic impacts of relocation of leisure services or playing spaces, this should be considered when testing outcomes
- Would expect to see Crane Valley and Osterley Park included in the survey area
- No mention of ensuring access to recreational and community services or increased services for vulnerable populations to mitigate potential impacts

Chapter 11 (Historic Environment) –

- Ensure that cumulative impacts on the historic environment and assets are assessed

Chapter 13 (Landscape and Visual Amenity) -

- Table 13.4. Consider including view from Osterley Park.
- Include reference to Hounslow Council's published Character Area Study.
- Consider the potential for off-site visual and landscape improvements.

Chapter 14 (Land Quality) –

- Ensure that the proposed methodology for assessing land quality is fully compliant with industry best practice and current guidance.

Chapter 16 (Noise and Vibration) -

- In accordance with 'Night Noise Guidelines (NNG) for Europe, 2009', the increase in "mean motility" relates to the Lnight at external façade and not LAeq 8hr, and therefore the metric proposed at point 8 in 16.10/16.11, under 'relevance to assessment', is not appropriate when determining LOAEL for night. We suggest that the metric should remain as that stated in the WHO standard.
- The outcome of DfT's Airspace Consultation Response, under point 9, the sub-clause 3 (pg. 16.11) is misrepresented because the Government has reviewed its position following the Public Inquiry (Enabling Works to Allow Implementation of full runway alternation during easterly operation at Heathrow Airport, 2015), where the operator is expected to offer financial assistance towards acoustic insulation to residential properties, regardless of whether or not they experience 3dB or more increase, which leaves them exposed to levels of noise 63dB, LAeq, 16hr or more. This mean that if any air space change, expansion or otherwise that leaves residents exposed to noise of 63dB, they would be entitled to financial assistance towards acoustic insulation.
- In the context of point 1 above, the 'noise objective' stated in 10/11 (16.12) should be interpreted in accordance with WHO NNG Guidelines.
- In the context of successful application of the ICAO's 'balanced approach', almost all of the four principals elements have failed to deliver because 'reduction at source' through use of quieter aircraft has not worked because the latest chapter aircraft engine technology might have become quieter, however their sound power and therefore their noise level has offset gains made through quieter design; Land use planning and management has been less effective due to pressure on LPAs to build more housing; Noise abatement operational procedures remain largely ineffective for communities in the immediately vicinity of the airport; and 'Operating restrictions' to prevent noisier type of aircraft during sensitive time periods, early mornings and late departures have been ineffective because there are always unscheduled flights that are sanctioned to avoid delays the next day. It would seem that different approach is needed for the operator to demonstrate compliance with the ICAO principals, possibly through ICCAN.
- We accept the fact that the airspace change process (ACP) and development consent order (DCO) processes needs to be independently robust, however CAA guidance and best practise should be followed and the use of indicative flight paths should be avoided because they may not be fully representative of real-time multiple flight paths that will be likely under expanded Heathrow operations. In other words, use of indicative flights paths is likely to lead to under-estimation of noise climate around Heathrow (16.7.3).
- Re. section 16.10.70, the potential impact of static noise sources, in addition to using BS4142, should consider designing out noise from such static sources by limiting their

noise level 10dB below the background, i.e. restrict sound power level of all static sources.

Chapter 18 (Water Environment)

- EIA needs to be compliant with best practice guidance and most up to date borough evidence base such as the SFRA

I trust this is of assistance.

Yours Sincerely,

Marilyn Smith
Chief Planning Officer GH

INTRODUCTORY CHAPTERS 1-4, CHAPTER 19 – Outline Structure of ES				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
General	Contents	No overall contents page	Future reports should include an overall contents page to facilitate better navigation of the document for consultees.	Include an overall contents page in future reports.
Chapter 1 - Introduction	Volume 1, Chapter 1 (Introduction), Paragraph 1.2.5	*'The components themselves are well determined and their final locations and detailed design are being refined'* – It is unclear exactly what this statement means and how it related to the scheme to be assessed.	Refer to comments below regarding Rochdale Envelope approach and the need to clearly set out the parameters and flexibility of each of the design components at each stage of assessment.	HSPG to be consulted on the Rochdale Envelope approach to be applied to ensure assessment of reasonable worst case.
	Volume 1, Chapter 1 (Introduction), Paragraph 1.2.5	Section notes that a 'further Scoping Opinion' may be sought in future. In what circumstances would a further Scoping Report be issued for consultation? HSPG is concerned that the need for a further Scoping Report implies that the scheme is insufficiently developed at present for an informed Scoping Opinion to be adopted by PINS. The current Scoping Report suffers due to a very high degree of uncertainty on scheme elements at present.	HSPG would support production of a further refined Scoping Report for consultation once further scheme details have been developed; this would ensure the assessment effort is focussed on the key environmental risks and appropriate mitigation is built into the design at an early stage.	HSPG would support production of a further Scoping Report once a greater level of design detail is available to ensure the focus of the EIA is properly directed and identify appropriate mitigation measures as early in the assessment process as possible.
	Volume 1, Chapter 1, Section 1.7.11	The relationship between the ACP and DCO processes is not clearly set out here, i.e. *'coordinated but kept separate throughout'*. It is accepted that indicative flight paths will need to be adopted in the EIA, but what will the mechanisms be to ensure some integration in the approach?	Greater clarity on the relationship and interaction between the ACP and DCO going forward is required, which will ensure that the EIA provides an fair and accurate assessment of the environmental effects of the proposal.	Further detail on the relationship between the ACP and DCO and the mechanisms to be adopted to ensure an integrated approach.
Chapter 2 – Description of the existing site and its surroundings	Volume 1, Chapter 2	Provides an appropriate summary of the existing site.	More detailed information on the existing site would be expected to be included in the PEIR and ES.	More detailed information on the existing site would be expected to be included in the PEIR and ES.

INTRODUCTORY CHAPTERS 1-4, CHAPTER 19 – Outline Structure of ES				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Chapter 3 – The DCO Project	Volume 1, Chapter 3	<u>Rochdale Envelope Approach</u> HSPG recognises that the scheme is still at options masterplanning stage and there are elements of each component which are undefined, and will need a degree of flexibility up to and including the final DCO scheme. However, at present HSPG consider that the approach to the Rochdale Envelope to be adopted at later stages of assessment is poorly defined in the Scoping Report in relation to treatment of individual environmental topics. The Rochdale Envelope approach should ensure the assessment of a reasonable worst case, i.e. a conservative approach to each of the topic areas. The scheme parameters to be assessed may therefore vary by topic area, depending on what configuration of elements are the 'worst-case' for each topic. This is a standard approach adopted on several similar major schemes where design flexibility has been required, but is not adequately set out in the Scoping Report at present. The flexibility requirements inherent in each major component of the development is considered to be adequately addressed in the Scoping Report but will need to be reviewed and updated as the scheme design progresses.	Transparency in method and application of a Rochdale Envelope approach will allow for a comprehensive assessment and identification of mitigation measures for the local community, whilst retaining flexibility for amendments as the plans evolve.	The Rochdale Envelope Approach is currently poorly defined and does not fully adopt best practice and the approach set out in PINS advice note Nine. Recommend review of PINS advice note Nine and the setting out of a more clearly defined approach. HSPG to be consulted on the Rochdale Envelope approach to be applied to ensure assessment of reasonable worst case.
Chapter 4 – Approach to EIA Scoping	Volume 1, Chapter 4, Section 4.2.6	This section states that *..'the topic chapters consider the environmental effects of the full range of options, to ensure that the likely significant effects of each of the component*	The combination of elements representing the worst case for each environmental topic would represent a more comprehensive and useful method while still retaining flexibility in the design.	The Rochdale Envelope Approach is currently poorly defined and does not accurately adopt best practice and the approach set out in PINS advice note Nine. Recommend review of

INTRODUCTORY CHAPTERS 1-4, CHAPTER 19 – Outline Structure of ES				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		options have been scoped into the assessment, meaning the scoping exercise will remain applicable and robust after the options have been further refined...' Refer to comments above on Rochdale Envelope approach – this statement does not suggest the adoption of a transparent and robust Rochdale Envelope approach.		PINS advice note 9 and more clearly defined approach. HSPG to be consulted on the Rochdale Envelope approach to be applied to ensure assessment of reasonable worst case.
	Volume 1, Chapter 4, Section 4.4	Consideration of waste is proposed to be excluded from the EIA as it will be covered in other DCO products including the Resource Management Plan. This is not typical of similar DCO EIAs, and the approach risks ignoring significant environmental effects of the proposal in relation to waste and materials management, difficulties in identifying cumulative effects, and the effects on traffic and local communities, if not fully integrated in EIA process.	An integrated waste assessment within the EIA process will ensure that all potentially significant effects are considered, mitigation measures identified and the receptors directly and indirectly affected by waste-related issues clearly identified.	HSPG would like to see waste issues included as a fully integrated part of the EIA. This will ensure cumulative and in-combination waste effects are identified and addressed and the significance of any potential effects are identified.
	Volume 1, Table 4.3	Generic significance matrix and preceding text indicates that 'moderate' effects would be considered usually significant, but in some topic specific circumstances, may be deemed not significant. All other levels of effect are deemed non-significant (marked green in Table 4.3). EIA best practice almost always adopts an approach which defines major and moderate effects as significant. It is also not clear how the decision as to whether a moderate effect is significant will be made.	Moderate effects should be considered significant in all cases and appropriate mitigation applied accordingly – this is in accordance with best practice. Otherwise, a very robust argument and transparent process for determining which moderate effects are not significant needs to be demonstrated.	Moderate effects should be considered significant in all cases and appropriate mitigation applied accordingly – this is in accordance with best practice. Otherwise, a very robust argument and transparent process for determining which moderate effects are not significant needs to be demonstrated.
Chapter 19 – Outline Structure of the ES	Volume 1, Chapter 19	HSPG question the logic of separating the cumulative effects and in-combination effects. A combined chapter in the PEIR/ES would be in keeping with best practice and ensure all interactions are identified and visible in one place.	A combined cumulative and in-combination assessment would reflect best practice and ensure all interactions and effects on local communities are identified.	Combined cumulative/in-combination chapter recommended for PEIR/ES.
	Volume 1, Chapter 19	A section describing the Rochdale Envelope approach to be adopted and any remaining	See comments above re Rochdale Envelope approach and clearly setting out parameters and	See comments above re Rochdale Envelope approach and clearly setting out parameters

INTRODUCTORY CHAPTERS 1-4, CHAPTER 19 – Outline Structure of ES				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		flex in the design should be included in the PEIR and ES. The assessment parameters of the scheme for each environmental topic should also be set out in each topic chapter.	flexibility for each scheme element and environmental topic assessment.	and flexibility for each scheme element and environmental topic assessment.

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 5 (Air Quality), Section 5.4 (Study Area), Para 5.4.4 Volume 2, Figure 3.1 and 5.1	**<u>Extent of the core assessment area</u>** The initial core assessment area is proposed as a grid 12 km by 11 km centred on the existing Heathrow Planning Boundary. Whilst it is noted that the boundaries may be subject to change (based on identification of affected roads, it is our view that the initial assessment area is too limited in spatial extent, particularly to the west where it appears not to acknowledge the location of the new runway. It also omits the Additional Development areas shown in Figure 3.1.	The initial core assessment area should as a minimum use the DCO boundary as a basis, not the existing planning boundary, and apply a suitable buffer around it on a precautionary basis so as to not exclude important baseline information. Slough Borough Council is expected to declare an AQMA in Langley, slightly further west than the extent of the core assessment area, in addition to their existing AQMAs adjacent to the M4 which may be affected by the proposals. The study area should actively include these existing and proposed AQMAs which may similarly have been excluded on the basis of the initial, limited study area.	Extend the core assessment area to take account of (i) the DCO boundary; (ii) Additional Development Areas; (iii) existing and proposed AQMAs for all affected local authorities (HSPG to coordinate provision of data?)
	Volume 1, Chapter 5 (Air Quality), Section 5.4 (Study Area), para 5.4.9	**<u>Identification of affected roads</u>** The spatial limit of the core assessment area may be extended if traffic modelling indicates that traffic movements on links outside the proposed 12 km by 11 km grid are likely to be affected. The report states that Highways England DMRB (2007)[1] screening criteria will be	A precautionary approach to identification of affected road network, particularly in light of the limited extent of the initial core assessment area and poor air quality in some local urban areas, is preferred. The IAQM[2] (2017) land-use planning guidance includes more stringent screening criteria, set specifically with land development in mind, including that	Use IAQM Screening Criteria to identify affected road links

[1] Highways Agency, Design Manual for Roads and Bridges. Volume 11. Section 3. Environmental Assessment Techniques. Part 1. HA207/07. Air Quality, 2007

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		used to determine whether road links will be affected: - Road alignment will change by 5 m or more - Daily traffic flows will change by 1,000 Annual Average Daily Traffic (AADT) or more - HDV flows will change by 200 AADT or more - Daily average speed will change by 10km/hr or more - Peak hour speed will change by 20km/hr more. The HE's guidance is intended for use on schemes affecting the Strategic Road Network, which would typically move traffic away from populated areas. It was not intended for land development which has the potential to increase flows on roads in urban areas. The DMRB air quality guidance was developed over 10 years ago, at a time when (i) less was known about the health effects of NO_2, now understood to be associated with morbidity (not just in combination with PM), and (ii) when vehicle emission reductions were expected to result in lower concentrations in future, a trend which has not been realised in many areas (despite certain of the newest, mostly petrol, vehicles having lower emissions closer to the latest standards). The scoping report shows that local NO_2 concentrations are high and a downward trend is not clearly apparent, thus a smaller change now may be of greater importance than it was in 2007. AQMAs continue to be declared, specifically in congested areas where emission rates have historically underestimated actual exhaust conditions (a point acknowledged in	within urban areas. It includes the following traffic flow thresholds: - Changes in LDV flows by (i) more than 100 AADT within or adjacent to an AQMA; or (ii) more than 500 AADT elsewhere; - Changes in HDV flows by (i) more than 25 AADT within or adjacent to an AQMA; or (ii) more than 100 AADT elsewhere. The IAQM notes that "*where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate*." For example, using DMRB, any roads where there is an increase of fewer than 200 HGVs per day would not be assessed in detail in the EIA. By contrast, IAQM guidance states that an increase of 25 HGV per day in an AQMA should trigger a detailed air quality assessment, or 100 outside an AQMA. These criteria are considered more appropriate in urban settings where smaller changes in air quality may be critical to achieving compliance with EU limit values. Given (i) the proximity to current and planned AQMAs, (ii) the proximity to areas of known Limit Value exceedance as modelled by Defra's PCM (see comments on the limitations of this national scale model), and as demonstrated by local monitoring, (iii) the magnitude of the proposed development and duration of the construction period, (iv) uncertainty of future baseline projections, (v) the range of uncertainty of the forecast impacts of the Surface Transport and Freight Strategies, it is recommended the study takes a precautionary approach and applies IAQM screening criteria for changes to traffic flows, as a minimum those in urban areas and existing and proposed AQMAs, in order to identify a robust study area and ensure potentially significant impacts are not missed.	

[2] EPUK & IAQM Land Use Planning & Development Control: Planning for Air Quality. January 2017.

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		Appendix 5.1, para 1.4.6). Arguably, then, a smaller increment could now result in a significant effect, particularly within AQMAs in town centres.		
	Volume 1, Chapter 17 (Traffic and Transport), Section 17.4 (Study Area), para 17.4.8	The traffic assessment will consider only areas with change in flows of 30% or 10% HGV flows in sensitive areas. It is important that potential air quality impacts within AQMAs are given due consideration even where these may not fall below the thresholds for the traffic assessment. A numerical change in HGV numbers is preferable as a criterion to a percentage change.	The traffic assessment should include consideration of impacts on AQMAs even where the change may be less than 10% of the total flow.	Review traffic assessment methodology to ensure all potential air quality impacts within AQMAs are given due consideration.
	Volume 1, Chapter 5 (Air Quality), Section 5.4 (Study Area), para 5.4.13-14 Volume 2, Figure 5.2	**Assessment of compliance** The methodology proposes comparison with selected PCM links to assess compliance with EU limit values. In fact, the wording in the Airports National Policy Statement is broader than this, requiring the applicant to demonstrate that construction and operation *"will not affect the UK's ability to comply with legal obligations"*. These include EU limit values (as established under the Air Quality Directive 2008), but reference is also made to the National Emission Ceilings Directive. The NPS requires the environmental statement to assess *"existing air quality levels for all relevant pollutants referred to in the AQS Regulations 2010 and the National Emission Ceilings Regulations 2002"* in addition to *"forecasts of levels for all relevant air quality pollutants at the time of opening"*. The Airports NPS does not specifically refer to Defra PCM compliance, but "areas above the	A broader assessment of compliance would provide local authorities in the surrounding areas with more confidence that the development will not affect their ability to comply with legal requirements.	The assessment of compliance should include consideration of the National Emission Ceilings Regulations, in addition to the AQS Regulations. Assessment of compliance with EU limit values should be broader than use of the PCM model alone.

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		limit value", requiring a broader definition of compliance (ref. also the recent Silvertown DCO). Revisions to the text of the National Planning Policy Framework signal that it is now not only areas of exceedance that are of concern. Project compliance with objectives and EU limit values must look beyond the PCM modelled area and Greater London Agglomeration as impacts may occur at sites not in the model, and further to the west including M4 Slough AQMA. Given the uncertainties and gaps in Defra's crude nationwide PCM model, which are well known to AQ specialists, it seems wholly inadequate for the proposed development only to focus on compliance on PCM links, not least because it omits the entire M25 as well as M4 through Slough. Furthermore, the rates of decline in concentrations assumed in the PCM model (Table 5.7) bear little resemblance to the trends in the study area (Table 5.3). For example, the PCM model suggests that concentrations in Colnbrook AQMA at roadside are meeting the NO_2 AQ objective; Slough monitoring (Figure 5.5) suggests otherwise.		
		Figure 5.2 shows the "key Defra PCM locations" just as centre points rather than the full extent of the model links.	Compliance along the full extent of PCM links should be assessed not simply as a point, to ensure the worst case receptors are considered.	Assess the full extent of PCM links, not only at the centre points. Revise figure to show the full length.
		Para 5.4.14: As written, this seems to suggest that airport related emissions will not be included in the assessment of compliance.	Emissions from all sources should be included within the compliance assessment, to ensure that all impacts are considered when calculating total change with the proposals.	Include emissions from all sources within the assessment of compliance
	Volume 1, Chapter 5 (Air Quality),	**<u>Construction Dust</u>** The dust assessment must be transparent in its definition of construction dust emission	Transparency in method and application of a Rochdale Envelope approach will allow for a comprehensive assessment	HSPG to be consulted in definition of construction dust

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	Section 5.4 (Study Area), para 5.4.15, paras 5.9.10-16	magnitudes, and of receptor/area sensitivity. A Rochdale Envelope approach should ensure the assessment of a reasonable worst case, i.e. a conservative approach to construction dust emissions estimates.	and identification of mitigation measures for the local community, whilst retaining flexibility for amendments as the plans evolve.	emission magnitudes and area sensitivity and on the Rochdale Envelope approach is applied to ensure assessment of reasonable worst case.
	Volume 1, Chapter 5 (Air Quality), Section 5.4 (Study Area), para 5.4.17, para 5.9.17	**Odour** More detail on potential odour sources locations, strength, and emission type required to allow comment on the proposed assessment method. A qualitative Source-Pathway-Receptor approach for odour (as outlined in IAQM guidance) is reasonable during construction. It is unclear whether detailed modelling of aircraft odorous emissions of VOCs including diffuse emissions from fuel handling is proposed.	Further information should be presented in the PEIR to justify the chosen approach to odour assessment. Good practice mitigation measures for handling, containing and disposing of any contaminated soil or other odour sources should be adequate to ensure no significant impacts on the local community.	Present further analysis in the PEIR to justify chosen approach to odour assessment. Consult with HSPG on recommended odour containment methods
	Volume 1, Chapter 5 (Air Quality), Section 5.5 (Sources of data used in scoping), paras 5.5.4-5 Volume 2, Figures 5.4 and 5.5	**Baseline monitoring data** Figures 5.4 and 5.5 do not include any monitoring from within the Slough AQMA on the M4 It would be more informative to present the data with an intermediate colour for sites approaching/just exceeding the AQS objective (e.g. within 10%), as these may exceed/meet in future with the proposals	Inclusion of additional monitoring data from nearby AQMAs, coupled with more detailed presentation of results, would enhance understanding of the baseline conditions at sensitive locations and potential for improvements/small deteriorations to have a significant impact.	Include monitoring data from relevant local authorities in a wider study area. Present monitoring data with an intermediate colour for sites approaching the objective (e.g. within/over 10%).
	Volume 1, Chapter 5 (Air Quality), Section 5.6 (Baseline Conditions)	**Baseline Conditions** **Para 5.6.3:** This could also acknowledge the portion of PM that is formed by secondary particulate formation following emission of NO_X and SO_2 (of which aircraft and land transport are a key source)		

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		Table 5.3: - Although not formally removed from the air quality strategy[3], the higher benzene objective for 2003 is essentially superseded by the lower limit to be achieve by 2010. The annual mean objective for $PM_{2.5}$ (as alluded to in 5.6.7) is not included in this table.		Include $PM_{2.5}$ annual mean objective
		Para 5.6.6: This should reference AQMA which may be on a route affected by additional traffic as a result of the airport expansion. For instance, both the Slough M4, and the proposed new AQMA in Langley.	AQMAs in a potentially wider study area to be considered, noting that the IAQM criteria for traffic changes are more stringent. Inclusion of additional AQMAs in the assessment will provide HSPG with information on where small changes may have a significant impact.	Ensure definition of study area and description of baseline within it is an iterative process
		Para 5.6.13 – CO objective/concentrations should be described in units of mg/m^3		
		Table 5.4: The scoping report has not included a complete analysis of the data such as trends. Inclusion of 2017 data would help illustrate recent trends as 2016 is generally considered a poor year for air quality. Some monitoring sites appear at first sight not to show any clear trend, many are stable and some may be increasing. This is in contrast to the justification provided for use of DMRB traffic change criteria (para 5.4.11), which focuses on the expected reductions in vehicle emissions in future.	Statistical analysis of at least 5 years' data should ideally be reviewed in the PEIR to build a robust baseline and thus ensure that future projections are appropriate and realistic	Include trend analysis at PEIR stage
		Paras 5.6.20 and 5.6.21: Other information sources to provide baseline evidence regarding dust deposition and/or odour would be useful in order to establish a robust starting point. Does Heathrow maintain a complaints log regarding its activities? Is there any further evidence or monitoring from the Environmental Management System?		Include information from historic Heathrow surveys of dust and odour
		Para 5.6.21: Information regarding the scope of the baseline odour surveys is limited.	A robust monitoring regime will help to ensure appropriate mitigation is put in place	What will the surveys consider – sniff tests, specific, indicator compounds or odour by

[3] Defra (2007) Air Quality Strategy https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf

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				olfactometry?
		Likely Significant Effects		
	Volume 1, Chapter 5 (Air Quality), Section 5.7 (Likely significant effects)	**Para 5.7.1:** Limiting the scope of the road traffic assessment to NO_X/NO_2 and $PM_{10/2.5}$, is considered appropriate. It is noted VOCs will also be included for aircraft emissions. If industrial processes associated with the airport are specific emitters of other pollutants e.g. SO_2, heavy metals, these should also be considered.		
		Table 5.8: No reference to ecological sites as receptors.	**Table 5.8:** Receptors in final column should also include ecological sites.	Include ecological sites as receptors in Table 5.8.
		Table 5.8: The scope of the assessment for the construction phase includes emissions from construction vehicles and plant through fuel combustion that could increase concentrations of NO_2 and PM. Emissions from worker vehicles accessing the site appear not to have been considered. Further, it is unclear whether an assessment of road traffic emissions will be undertaken during construction as well as operation. Table 17.3 of Chapter 17 (Traffic and transport) appears comprehensive in its coverage of likely effects. Consideration of HGV impacts in the air quality chapter, given a) significant construction movements b) possible freight parking area (para 5.10.6) and c) increase in freight at the airport, appears weak in comparison.	A conservative approach to the assessment of construction traffic emissions should be taken in the event of uncertainty regarding phasing of works. This should include both HGV and worker movements, as well as temporary traffic management, particularly with regard to the M25 works which may displace traffic. Given the timeframes for construction works, and the extensive changes proposed to the road network once operational, plans to manage the traffic disruption should be set out (e.g. diversions, contraflow, or overnight works), and a suitably detailed air quality assessment undertaken to identify mitigation.	Detailed air quality assessment of traffic emissions during the construction phase, including HGV movements, worker vehicles, and temporary traffic management, and any increase in freight movements once operational.
		Under mitigation options for the construction phase (para 5.10.5), it is noted opportunities are being investigated to maximise the transport of bulk construction materials by rail, as a means of reducing construction traffic and emissions. If this option is taken forward, rail freight emissions should be subject to screening at PEIR stage. Note screening criteria within Defra's Local Air Quality Management Technical Guidance TG (16) relate to passenger trains (DMU) which	A detailed approach to the screening of construction rail emissions would be welcome in the PEIR, which should as a minimum include identification of sensitive receptors within 30 m of the proposed freight routes and investigation of current NO_2 concentrations at those receptors, and potential for impacts in combination with construction traffic emissions, prior to screening out significant impacts (Defra background maps of annual mean may not accurately reflect the concentrations experienced at receptor locations).	Undertake detailed screening of construction rail emissions

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		have much lower emissions than freight trains (ref. DfT webTAG guidance).		
		Table 5.8: The scope of the assessment for the operational phase considers aircraft movements on the new runway and taxiways. Appears not to consider reductions in emissions from the two existing runways, once the third runway is operational	Assessment of potential reduction in emissions from other runways, e.g. through reduced holding time may identify air quality benefit	Holistic assessment of operation of the three runways operating together.
		Table 5.8: The scope of the assessment for the operation phase includes combustion emissions of NO_2 and PM from both aircraft movements on the new runway and taxiways, as well as land based activities in support of airport operation. However, there may also be non-combustion emissions of PM from tyre wear, particularly from aircraft landings. Whilst emission factors are likely to be highly uncertain, given the focus on reduction to exposure to $PM_{2.5}$ within the 2018 Clean Air Strategy, the PEIR should consider this source / provide justification for scoping out.	Include consideration of non-combustion PM emissions from airport operations and aircraft (e.g. tyre wear from aircraft landings), with reference to objectives to reduce exposure to $PM_{2.5}$.	Consider non-combustion PM emissions from aircraft and airport operations
	Volume 1, Chapter 5 (Air Quality), Section 5.9 (Assessment Methodology), para 5.9.22 Volume 3, Appendix 5.1 (Detailed Modelling)	**<u>Assessment Method: Detailed Modelling</u>** **Appendix 5.1, Section 1.1 Sources:** This appears only to consider operational phase sources. Detailed modelling should also be undertaken for the construction phase, given length of time and expected numbers of construction traffic movements (both HGVs and workers)/construction plant and NRMM.	Detailed air quality modelling of construction phase to fully assess impacts on sensitive receptors in a well defined and precautionary study area.	Include detailed air quality modelling for the construction phase where appropriate
		Appendix 5.1, Para 1.1.2: The recognition of uncertainty is welcome although it is unclear how or why the models will be validated. Use of a state of the art model that is approved for use by the Environment Agency / Defra, such as ADMS or AERMOD, would remove need to validate models. However, as set out in Appendix 5.1, Section 2.6, the model results should be verified through comparison with real world monitoring data, and adjusted where appropriate.	Proportionate approach to model validation and verification	Consider whether validation of the models themselves is necessary.

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		Calculation of LTO emissions up to 1km height is considered appropriate for aircraft emissions with regard to impacts on local air quality. However there may be impacts on ecological sites through deposition of pollutants and justification of applying the same approach should be provided.	Consideration / justification required for deposition of nitrogen/acid to ecological receptors further afield once aircraft are beyond this area.	Consider need for assessment of aircraft emissions beyond 1km LTO cut off for ecological impacts
		App 5.2 **Para 2.3.2** – there is unlikely to be a single "worst case" meteorological year for all receptors under varying operational scenarios/ layout options/runway allocations. This may result in underreporting of findings. **Para 2.5.2, 2.7.6** – the primary NO2 emission from aircraft is likely to differ to those for road vehicles therefore application of PCM/LAQM approaches may not be suitable. Justification for applying these factors, including demonstrating they are conservative, should be provided in full. **Para 2.7.3** – Justification that the assumption that only direct deposition of NOx is relevant appears to be missing, can a reference be provided? Clarify if same exclusion of ammonia for road traffic is relevant to aircraft emissions. Even if released in smaller quantities, its relative contribution to N deposition is greater.		Concentrations should be presented for a variety of years Ensure appropriate NOx to NO2 conversion is applied A full explanation of the justification behind choices for approach to ecological assessment
	Volume 1, Chapter 5 (Air Quality), Section 5.9 (Assessment	**<u>Effect significance</u>** The approach for construction traffic is to use HE interim guidance[4] to assess the significance of effects from changes in NO_2 and PM concentrations. This defines changes of less	Given (i) the proximity to current and planned AQMAs, (ii) the proximity to areas of known Limit Value exceedance as modelled by Defra's PCM (see comments on the limitations of this national scale model), and as demonstrated by local	Use IAQM guidance on land use planning and development control criteria to determine significance of effect, as a

[4] Highways England, Interim Advice Note 174/13 Evaluation of Significant Local Air Quality Effects, 2013

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
	Methodology), para 5.9.25-27 and Table 5.10	than or equal to 1% of the air quality threshold as 'imperceptible' (0.4 µg/m³ for NO_2 as an annual average). Conversely, IAQM guidance on land use planning and development control,[5] which is considered more appropriate for developments in urban areas, describes changes of less than 0.5% as negligible (0.2 µg/m³ NO_2 as an annual average). Use of DMRB guidance, may result in changes that are significant for local authorities to be missed.	monitoring, (iii) the magnitude of the proposed development and duration of the construction period, (iv) uncertainty of future baseline projections, (v) the range of uncertainty of the forecast impacts of the Surface Transport and Freight Strategies, it is recommended the study takes a precautionary approach and applies IAQM guidance significance criteria, particularly in areas within or adjacent to AQMAs, or where concentrations are approaching the air quality objectives.	minimum in areas of existing/proposed AQMAs and other sensitive areas
		Definition of significance may need to be redfined in light of Defra's draft Clean Air Strategy which aims to reduce exposure to $PM_{2.5}$ and introduction of tighter standard. DMRB does not explicitly consider this pollutant.	Consideration of significance of $PM_{2.5}$ results with reference to exposure reduction will help identify appropriate mitigation.	Include consideration of $PM_{2.5}$ significance in context of exposure reduction
	Volume 3, Appendix 4.3 (Guidance and Best Practice Documents)	**<u>Guidance and Best Practice Documents</u>** Relevant guidance for air quality also includes IAQM Guidance on land-use planning and development control, considered best practice methodology for land development in spatial planning. The DMRB is intended for application to major new road schemes. This IAQM guidance document on the other hand is applicable to assessing the effect of changes in exposure of members of the public resulting from residential and mixed-use developments, especially those within urban areas where air quality is poorer (and thus a smaller change in air quality may be more significant).	IAQM Guidance is best practice methodology for land development, and provides more sensitive assessment criteria for the identification of affected roads, as well as the significance of effects.	Use IAQM Guidance on land use planning and development control, as best practice methodology for land development, applicable to assessing the effect of changes of exposure, particularly within urban areas.
		Environment Agency (EA) online guidance for dispersion modelling of point sources should be referred to for sources such as power generating plant.	EA guidance is best practice for dispersion modelling of point source emissions	Use EA guidance for dispersion modelling of point sources
		The reference in this table and in Appendix 5 1.2.1 to PSDH report on air quality is welcomed.		Assessment to be done in line with PSDH

[5] EPUK & IAQM Land Use Planning & Development Control: Planning for Air Quality. January 2017.

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		Slough has developed a draft Low Emissions Strategy[6], which references Defra's emission damage cost approach to assess mitigation requirements. The London Plan (Policy 7.14) also includes the requirement that developments are 'air quality neutral', and require calculations of building and transport emissions. Inclusion of such an approach to mitigation for the Heathrow Expansion would be relevant, particularly in light of the wide area that may be affected by emissions and thus population exposed, including to $PM_{2.5.}$ The AQC air quality neutral guidance[7] recognises that major transport infrastructure development uses the DfT's webTAG methodology which includes economic valuation.	Inclusion of an emission damage cost methodology or equivalent, would provide a means of quantification and monetisation of emissions impacts, which could be used to inform the assessment of mitigation options (including on-site, off-site and financial contributions).	Include an emissions damage cost assessment or equivalent, for the construction and operation phases.
Alternative options	General	Ensure a Rochdale Envelope approach is applied to ensure the assessment of a reasonable worst case, i.e. a conservative and precautionary approach, where potential exists for the location/magnitude/temporal scope of emissions to change during the DCO process and once operational	Transparency in method and application of a Rochdale Envelope approach will allow for a comprehensive assessment and identification of mitigation measures, whilst retaining flexibility for amendments as the plans evolve.	Ensure a Rochdale Envelope approach is applied to ensure assessment of reasonable worst case
Cumulative effects	Volume 3, Appendix 3.1 (Cumulative effects)	The principle of the approach appears sound in relation to air quality effects: a. Scheme-wide effects = DCO with "other development" associated with airport expansion b. Effects of Scheme plus other development - under construction, permitted, submitted - in line with PINS advice note 17	-	-

[6] Slough Low Emission Strategy (LES) 2018-25 Draft. November 2017. Available online at: http://www.slough.gov.uk/downloads/LES_final_draft_23Nov.pdf

[7] Air Quality Consultants/Environ (2014) Air Quality Neutral Planning Support Update http://www.aqconsultants.co.uk/getattachment/Resources/Download-Reports/GLA-AQ-Neutral-Policy-Final-Report-April-2014.pdf.aspx

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		c. In combination effects - e.g. noise, air quality and visual on health. The assessment scenarios (Appendix, Table 3.2) appear sound, covering both construction and operational impacts on existing and new receptors. A robust assessment year should be selected, ensuring a balance between likely improvements in air quality vs increase in emissions due to growth in land/air traffic The proposed use of strategic traffic model data should take into account growth as a result of development as set out in local plans. This should include plans for surrounding local authorities not just those within which the DCO boundary sits, as this may affect flows in wider area. Model adjustment may be necessary to also consider for other developments not included in local plans. Table 3.1.1 - the air quality study area for cumulative impacts cannot be commented upon at this stage. It should be noted the area presented in the scoping report is subject to change (but in our opinion, should be expanded), as is the case for noise. Appendix A3.4 identifies 2079 cumulative developments. A proportionate approach to assessment would be welcome to ensure the assessment can be interpreted readily and the key impacts identified by stakeholders. This could incorporate an initial screening step undertaken to identify those with potential AQ Impacts.	HSPG should ensure ongoing consultation in the identification on relevant developments and on any approach to screening. Consideration should be given as to whether the Western Rail Link should be included as a Scheme Wide impact.	For cumulative developments where there is a high degree of uncertainty, apply precautionary principle and professional judgement in a qualitative assessment, if numerical data are not available to allow for modelling.
Scheme design	-	-	As a general measure, construction and operation should be planned so as to increase distance between source and receptor where practicable Potential to extend Ultra Low Emission Zone (ULEZ) to just inside the M25 boundary. Joint monitoring and review	-

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
			processes and action are required to monitor are quality targets and manage the improvement of air quality improvement and across the HSPG area impacted by expansion; HAL should be required to fund the air quality monitoring.	
Mitigation	Volume 1, Chapter 5 (Air Quality), Section 5.10 (Approach to Mitigation)	**<u>Mitigation: Construction</u>** References to specific guidance and further detail on proposed mitigation measures should be included, e.g. dust, non-road mobile machinery (NRMM), construction vehicles (HGVs and LGVs) and construction worker movements	Mitigation measures for construction dust should reference guidance by the GLA and IAQM. A commitment to vehicle standards for NRMM, should follow GLA guidance and SPGs. Emissions performance of HGVs and LDVs used during construction should be Euro VI/6 or better. Emissions from concrete batching/crushing screening will be controlled by a local authority permit	Assessment should be iterative, so that due consideration is given to emissions from mitigation measures such as the use of rail/waterways
	Volume 1, Chapter 5 (Air Quality), Section 5.10 (Approach to Mitigation)	**<u>Mitigation: Operation</u>** It would be useful to include details of the methodology by which the impact on air quality emissions and concentrations of mitigation measures will be quantified. For example, whilst it is assumed that changes to traffic volumes resulting from Surface Traffic and Freight mitigation will be incorporated into traffic modelling (and therefore into the AQ model), there are no details regarding a methodology to quantify the impacts of emission reduction measures, i.e. incentivising / requiring use of low emission vehicles – both as part of airport operations, as well as public vehicles accessing the site (e.g. measures identified within the ANPS, para 5.10.11, emission-based vehicle charging para 5.10.16). The methodology proposed does not include reference to air quality neutral or emissions damage costs (ref. Policy 7.14 within the London Plan and Slough's draft Low Emissions Strategy). Inclusion of such an approach to mitigation for the Heathrow Expansion, for both construction and operation phases, is welcome,	The air quality emissions and concentrations impacts of mitigation measures should be fully quantified, ideally including use of emission damage cost methodologies to inform whether additional mitigation (on-site, off-site or financial contributions) is required for either construction or operation phase emissions. Details of the methodology to be used set out in the PEIR.	Establish methods to be used to quantify mitigation impacts. Include an emissions damage cost assessment for the construction and operation phases.

Chapter 5 – Air Quality and Odour				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		particularly in light of the wide area that may be affected and thus population exposed, in particular to $PM_{2.5}$. Outline mitigation is provided at this stage and a more detailed mitigation strategy will be required for the EIA. The success of the air quality mitigation is dependent on the contents and delivery of separate documents (Surface Traffic Strategy, Freight Strategy and existing Heathrow Low Emissions Plan). The impacts of these strategies on air quality should be clearly established.	The following additional measures should be considered, many of which could be initiated at an early stage to improve local air quality, contribute to achieving legal compliance and help to offset both construction and operation emissions. - Investment in low emission bus fleet (i) servicing Heathrow; (ii) on other routes in surrounding areas as off-site / financial mitigation - Investment / funding to incentivise low emission taxis, for example provision of ULEV taxi ranks and supporting charging infrastructure at the airport, and surrounding rail hubs, supporting complete electric journeys from home to Heathrow. Note, there is a direct opportunity to work with Network Rail and develop Langley as an ultra-low emission hub, as Slough has already received £157k in OLEV funding for rapid charging facilities for plug-in taxis and the licensing committee is set to approve plans for all taxis to be ULEV by 2025. - Broader expansion of EV charging infrastructure, both within the airport and in the surrounding areas - Zero/low emission or electric vehicles as part of airport operations - Ringfencing of funds from emission-based access to support low emission measures within the local area	Consider broader measures to contribute to air quality improvement in surrounding areas. Maintain close communications with local authorities to maximise opportunities for a coordinated approach. HSPG should be kept informed of the development of mitigation options, and opportunities for a coordinated approach should be maximised.

Chapter 6 – Biodiversity				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 6	The desk study search area extends to 20km for international/European sites in relation to nitrogen deposition due to traffic. The HRA should also take into consideration SACs designated for bat	Full consideration should be taken of local development policies. The implementation of the Biodiversity Offsetting Strategy in full should ensure locally significant losses of habitat are taken into	Effects on bat species in relation to SACs should be assessed under the HRA. Clarification of the value of Local

Chapter 6 – Biodiversity				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		species which can be highly mobile and range long distances. Effects of local or negligible significance are proposed to be scoped out. LNRs and Sites of Local Importance for Nature Conservation (SLINCs) could be argued to be of local importance and any loss of these sites is of local significance. However, these sites have been valued at higher than local importance (Borough or County) in the Scoping report. This avoids these sites being scoped out of further assessment. The report states that Species of Principle Importance (SPI) are generally considered to be Nationally important (para 6.9.9), but in Table 6.12 regularly occurring populations of SPI are considered to be of Regional importance. The Biodiversity Offsetting Strategy would take into account negative effects on ecological features of local importance, even though effects on these features is deemed to be not significant. There is a risk that, if locally significant effects are not included within the EIA, these effects could be relegated at later stages of scheme development in relation to biodiversity offsetting targets. The identification of likely effects does not include the effect of increased run-off from the new runway and hard surfaces into watercourses causing increased water flow and flooding events.	consideration in providing biodiversity net gain. However, the mechanism for how this would be delivered, if not an integral part of the EIA process, should be fully explained.	sites (LNRs and SLINCs). Clarification of the value of populations of SPI. Clarification that biodiversity offsetting will take into account locally important habitats. Clarification that surface water run-off will be assessed in terms of volumes and flooding and the effects on biodiversity. A firm commitment to ensuring all effects of local or negligible significance are captured in the Biodiversity Offsetting strategy and the mechanisms for achieving this is not assessed in the EIA.
Cumulative effects	Volume 1, Chapter 6	Effects of local or negligible significance are proposed to be scoped out, without consideration of the cumulative effect of a number of locally significant effects.	Consideration should be made to the cumulative effect of a number of locally significant effects that could collectively be more significant.	Confirmation that the cumulative effect of a number of locally-significant effects will be taken into consideration.
Scheme design	Volume 1, Chapter	The outline scheme design provides large areas of new habitat. However, the detail of this habitat	-	Provision of preliminary

Chapter 6 – Biodiversity				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
	6	is outline at this stage and detailed calculations for the provision of offsetting for biodiversity net-gain is not set out in the Scoping report.		biodiversity net gain calculations.
Mitigation	Volume 1, Chapter 6	New habitats will require management in the long term (some e.g. meadow that are labour intensive). New habitats may be given over to local countryside organisations for future management which will require sufficient financial support. There is a risk that created habitats lose biodiversity value over time due to lack of management.	Consideration should be made of the ecosystem services provided by existing habitats loss and these services should be inherent in the new habitats provided.	Clarification required on how ecosystem services and long-term management of compensation sites are being taken into consideration.

Chapter 7 – Carbon and other Greenhouse Gases				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Sections 7.9.12 – 7.9.29	The positioning of the scope boundaries is important to the robustness of the study, as any exclusions or omissions will lead to an underestimated result. Further clarity on what specific items will be excluded and included in the study area is required. It is stated that the scope of the assessment will be decided by the amount of 'reasonable data or assumptions' available. Further detail should be provided, for each emission source, on the amount of data expected to be from actual project data, the amount that will be estimated p data, and what will be based on non-project-specific proxies. Any exclusions from the study should be clearly justified, and the effect of any	Further detail required on what specific items will be included in and excluded from the study boundary, which parts of the calculation will be based on actual project data and which will be based on proxy data. Further detail required on the basis of assumptions (e.g. has a reasonable worst-case been selected). Details on the approach to quantify and present carbon offsetting/sequestration to be provided.	Further detail required on what specific items will be included in and excluded from the study boundary, which parts of the calculation will be based on actual project data and which will be based on proxy data. Further detail required on the basis of assumptions (e.g. has a reasonable worst-case been selected). Details on the approach to quantify and present carbon offsetting/sequestration to be

Chapter 7 – Carbon and other Greenhouse Gases				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		assumptions on the accuracy of the result should be made. The assessment of operational emissions will use future projections, for example projected decarbonisation of the UK National Grid, and reduction in use of fossil-fuel powered vehicles. It is unclear how these future scenarios will be selected. Will a realistic worst-case be used? Over-estimation of UK electricity decarbonisation, for example, will lead to an under-estimation of operational emissions. Depending on the scenarios chosen, this may lead to significant inaccuracies in the study. The Scoping Report does not explain what the approach will be to quantifying and presenting carbon offsetting/sequestration as described in the Consultation Document.		provided.
	Volume 1, Sections 7.9.32 – 7.9.33	**Significance Assessment** The Scoping Report states that professional judgement will be used to determine whether emissions are significant, however it is not clear how this will be done in the absence of suitable best practice guidance. The IEMA guidance referenced in the report states that because GHG emissions will all contribute to climate change (the largest cumulative environmental effect and one that has a scientifically defined threshold) any GHG emissions might be considered significant.	**-**	**Significance Assessment** Further detail required on how 'professional judgement' will be used to determine significance of emissions.

Chapter 7 – Carbon and other Greenhouse Gases				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Alternative options	Volume 1, Section Table 3.7	GHG emissions are scoped out for a number of items under the category 'airport supporting facilities'. It is not clear why this is the case, as there will be both construction and operation impacts for these components.	-	Clarification on reasons why airport supporting facilities have been scoped out of the GHG emission calculations.
Mitigation	Volume 1, Section 7.10	Very little detail on mitigation measures is provided. It is suggested that mitigation measures will meet the requirements in ANPS (5.77, 5.78 & 5.79) and will include design elements, construction approach and traffic management. Further detail on envisaged mitigation measures that directly address the different sources of emissions should be provided. A significant proportion of GHG mitigation measures are achieved at design stage, when decisions about the scale and nature of development and the materials that will be used are made. Further mitigation for the construction phase can come through the specification of construction approaches. Actual and potential mitigation measures presented at this stage would demonstrate that carbon reduction is being embedded into the design.	GHG mitigation measures are integral to the design – see opportunities above. Some detail on how mitigation is being integrated into the design process should be included in the EIA. clima	Further detailed information around specific mitigation measures that are planned. This might include choice of materials and how material quantities are being reduced, how the design of the scheme minimises emissions from the operational phase, and what construction approaches might be specified to reduce emissions.

Chapter 8 – Climate Change				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**

EIA Methodology	Volume 1, Chapter 8	The methodology seems appropriate and proportionate, and based on relevant policy and legislation. It has also been agreed with the Environment Agency, who will be consulted on an ongoing basis as the study develops. However, it should be noted that the Environment Agency only has responsibility to the Government for ensuring climate change adaptation in relation to water related aspects.	-	-
Alternative options	Volume 1, Table 3.7	Climate Change is scoped out of the options consideration for a number of items under the category 'airport supporting facilities'. It is not clear why this is the case, as the climate resilience of these elements will need to be considered.	Clarification on reasons why airport supporting facilities have been scoped out of the climate change assessment.	Further clarification on scoping out of airport supporting facilities to be provided.
Mitigation	Volume 1, Section 8.10.1 – 8.10.9	The Scoping Report does not specify mitigation measures, rather states that these will be developed by environmental topic leads and embedded through the EIA process. Any additional mitigation will be incorporated into the Climate Change Adaptation Plan. Effects of climate change on local communities and local resilience to climate change should be considered in the EIA.	Measures to reduce the impacts of climate change on the local area and improve local resilience should be considered as part of the package of mitigation measures.	Local measures to address climate change should be considered in the package of mitigation measures. HSPG to be consulted on the Climate Change Adaptation Plan.

Chapter 9 - Community				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 9	The method focuses heavily on recreational spaces and routes; there is very little information on how effects of other types of community facility will be assessed (e.g. schools, places of worship etc).	Set out the approach to assessing the effects of the project on community facilities such as schools etc. This will need to consider / set out the approach to assessing displacement, severance and viability of the facilities	Set out approach to assessing effects on other community facilities, as it stands the method is focused on recreational spaces and routes.

	Paragraph 9.3.6	Paragraph 9.3.6 states that user surveys will be drawn upon where published by LPAs and undertaken with regard to users of recreational facilities, spaces and routes. The onus should be on the applicant to undertake these and this should include a wider range of community facilities (e.g. indoor sports facilities etc).	Paragraph 9.3.6 – Include a user survey of other community facilities, not just recreational spaces and routes.	Ensure that the applicant fills the gaps in user survey data and doesn't rely on solely LPA user surveys, this should include other community facilities not just recreational spaces and routes. Clarify how the effects on community viability will be assessed with reference to the effect on population and demographics. Open space assessments are an important data source, and it is helpful the OSA is being prepared but local assessments of need should take precedence, with the OSA supplementing these. Existing open space and recreational facility deficiency maps are an important data source and where not available should be prepared. The applicant should be using data on the value and quality of recreational spaces to inform the assessment. Local workers should be included as a potential receptor. Improve the user survey data by collecting usage data for a wider selection of community facilities (i.e. built facilities). Strengthen user data by collecting detailed information such as
	Volume 1, Section 9.6 and Table 9.4	Section 9.6 and Table 9.4 – Identifies baseline population & demographic information. However, it is not clear what the approach will be to assess the impact of the project on the population and demographic mix of the communities	Section 9.6 and Table 9.4 - Provide clarity on the approach to assessing the effect of the project on the baseline population and demographic conditions in each community and the impact this has on the viability of the community.	
	Volume 1, Table 9.3	Table 9.3 – Data Sources. Refers to studies from local authorities etc. The assumption is that local authority assessments will be used, however where these don't exist the Open Space Assessment (OSA) that is being carried out and is referred to in paragraph 9.9.10 should be used. Table 9.3 – open space and indoor recreation deficiency maps should be referred to as a specific data source in this table. Table 9.3 - The quality and value of the recreational space hasn't been referred to. This is important data that should be extracted and included in the assessment.	Table 9.3: - Ensure that local authority assessments are used as the starting point, to ensure data is based on local assessments of recreational need. - Include open space and indoor sport catchment / deficiency maps as a data source, and prepare these where they are not available. This will be important for understanding how the project impacts on existing deficiencies in open space and sports facility provision. - Inclusion of value and quality data, to ensure that there is a clear understanding of which are the best quality and highest valued recreational spaces.	
	Volume 1, Sections 9.6.9 - 10	Paragraph 9.6.9 - 10 and Table 9.5 – doesn't include workers at local businesses who could / are also likely to be users of recreational spaces and routes	Paragraphs 9.6.9 / 10 and Table 9.5 – to add local workers as a potential receptor.	

	Volume 1, Section 9.9.10 – bullet 7	Paragraph 9.9.10 (7) - Surveys of users of recreation facilities. There are some weaknesses with the proposed approach including: - The survey is exclusively assessing recreational routes and spaces, it would also be valuable to collect data on the use of indoor sports facilities and other community uses. - The paragraph doesn't specify what information about usage will be collected.	Paragraph 9.9.10 (7) - User survey data collection could be improved by: - Collecting usage information for a sample of other community facilities. - Strengthen user data, by collecting data on frequency of use of recreational space / route; distance travelled by user, mode of travel of user, whether the space / route is the primary space / route that the user visits (if not where is their primary space/ route and what others do they visit).	frequency of use etc. The assessment should use recreational provision standards that have been either adopted by LPAs or defined through an assessment of local needs. The standards need to be for all types open space and include indoor sports. Sensitivity of receptors should be amended so that it is clear where users of non-park recreational spaces and indoor facilities would be placed in terms of magnitude
	Volume 1, Section 9.9.10 – bullet 8	Paragraph 9.9.10 (8) – States that the OSA will set common standards for provision of open space throughout the agreed study area. The starting point should be to use adopted local provision standards as defined / adopted by the LPAs for affected recreational spaces. It is not clear from the scoping report that the standards will be for all types of open space (i.e. allotments, natural and semi-natural greenspace etc.) not just parks.	Paragraph 9.9.10 (8) – Where LPA's recreational provision standards are missing/ unavailable, adopting standards would be appropriate (if based on an assessment of local needs). The standards used in the assessment should be for all types of open space (i.e. allotments, natural and semi-natural greenspace etc.) not just parks. Indoor sports standards should also be used / defined.	
	Volume 1, Table 9.9	Table 9.9 – refers sensitivity of receptors to change of recreation and amenity. There are weaknesses in the approach proposed including: - The approach refers to users of 'Regional' or 'Metropolitan' parks etc as a way of considering the sensitivity. This approach works for parks which tend to be defined by a set 'hierarchy' but there are issues with other open space types (including semi-natural green space, water bodies etc.), as it is not immediately clear how each recreation space would be categorised. - It's not clear how indoor recreation facilities will be accounted for in terms of sensitivity, as they are not referred to in this table.	Table 9.9 – improve the approach to sensitivity of receptors as follows: - Define or identify how users of non-park open space types will be classified into a 'hierarchy' based on their size and importance. - Identify how users of indoor recreation facilities will be classified into a hierarchy, based on their catchment.	Define or identify how users of non-park open space types will be classified into a 'hierarchy' based on their size and importance. Identify how users of indoor recreation facilities will be classified into a hierarchy, based on their catchment.
	Volume 3, Appendix 9.4-3 Proforma Attribute Table	Appendix 9.4-3 Proforma Attribute Table The information collected during the walk over survey of recreational spaces and routes has some weaknesses including: - Quality – this attribute appears to be based on whether the site is 'fit for purpose' rather than the quality of the	Appendix 9.4-3 Proforma Attribute Table could be improved by: - Quality - Define / assess the quality of the recreational space, rather than whether they are 'fit for purpose'. - Value - Include the value of open space as an attribute to ensure highly valued spaces that	The following summarises the recommendations related to the proforma attribute table, Volume 3: - Amend the proforma to make improvements to the data collected in order to provide a clear understanding of the

		site. - Value – The value of the recreational space is not considered. - Access does not consider how many points of entry the space has, sites with multiple access points will be widely accessible to their surrounding communities - Amenities – doesn't refer to car or cycle parking, which is important in understanding how the spaces are used. - Perceptual features – refers to noise, this shouldn't be considered a perceptual feature. - Physical attributes – it is not clear how sports facilities e.g. tennis courts etc within a park would be considered, these are recreational facilities in their own right but also part of the overall recreational offer of the park - Does the proforma pick up the full range of multi-functional roles that public spaces can play, for example are the spaces used by local schools as outdoor classrooms, or is the space used for events (e.g. fireworks, fairs etc).	might be affected by the proposals can be clearly identified. - Access - Should note the number of entry points / ease of entry under public accessibility attribute. - Amenities - Ensure amenities that would impact on the usage of the recreational spaces are identified. - Perceptual feature - Noise in recreational spaces should be considered / assessed using noise data, and shouldn't be considered a perceptual feature. - Physical attributes - Ensure sports facilities get picked up in proforma All the above are important in helping to understand the quality, value and role of the recreational spaces that could be affected by the project, and will be important in ensuring any replacement land proposed in secondary mitigation would be of equivalent or better provision.	quality, value and role of the recreational spaces that could be affected by the project. This is important for ensuring any replacement land proposed in secondary mitigation would be of equivalent or better provision than that displaced.
Adequacy of consideration of cumulative effects	Volume 1, Chapter 9, Section 9.4	Chapter 9 - No specific approach is identified for cumulative effects on community. Section 9.4 – although study areas are defined, it is not specifically stated that these would also be the Zone of Influence for assessing cumulative effects on community.	-	HSPG would like to see clearer evidence of how community effects will be integrated into the cumulative effects assessment.
Outline scheme design	Volume 1, Chapter 3, Section 3.3 ad Table 3.7	Section 3.3 and Table 3.7 – identify that only new cargo floorspace and car parking could be considered as relevant topics for community; the scoping report should clarify why other airport supporting facilities are not relevant to community.	Section 3.3 and Table 3.7 - Ensure that airport supporting facilities are not relevant for the community topic. For example, the utilities network, is referred to as being to the west of the airport, diversions to these networks could potentially affect the community (either temporary or permanent) and therefore shouldn't be scoped out as relevant to the topic at this stage. Consider whether land take for car parking, (in particular, off airport) and the level of parking overall could be reduced in order to minimise the impact on communities and community facilities. Particularly given the potential for changes in technology that could result in a significant modal shift.	Confirm that the airport supporting facilities that have been scoped out as not relevant for the community topic could not potentially affect the community (either temporary or permanent). Ask for detail on how the level of parking required in particular off airport has been calculated and whether this allows for scenarios for reduced levels of parking.

Suitability and robustness of proposed mitigation measures (on site, off site and financial)	Volume 1, Section 9.10 – Approach to mitigation.	Section 9.10 - For community the embedded measures included are: - Property compensation package in the CPZ and voluntary package in the WPOZ - A commitment to set up a Heathrow Community Engagement Board - Commitment to Community Mitigation Fund For the property compensation package, the measure identified refers to residents; it's not clear whether this measure extends to business and in particular community facing businesses? The compensation package for the community is not clearly explained. The community mitigation fund is not clearly explained.	Explain how WPOZ and CPZ are defined and how the compensation package is calculated. Explain the community mitigation fund: what it will be used for and how the funds will be distributed. Consider whether there is an opportunity to phase development in a way that ensures communities are only displaced to minimise disruption and ensuring adequate facility provision prior to displacement. For communities surrounding the airport there are likely to be a range of 'secondary' mitigation measures that, as yet, are not identified in the scoping report and will be identified at the next stage. It will be important to ensure these secondary mitigation measures such as replacement community facilities and recreational amenities (both temporary and permanent replacement facilities) are identified.	Provide a more detailed explanation of the embedded measures such as the compensation package and community mitigation fund. Secondary mitigation measures will be important for the community topic which are not defined at this stage of the EIA.

Chapter 10 – Economics and Employment				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Adequacy of EIA Methodology	Volume 1, Chapter 10	The proposed methodology does not include analysis of the net additionality of socio-economic impacts. So for example, it would not capture what proportion of "new" jobs would really be new and would not be displaced from elsewhere. Or what proportion of these jobs would be taken up by local people and benefit local communities, rather than leak further away. The policy review makes no mention of the Government's Industrial Strategy.	-	The assessment needs to include analysis of the net additionality of socio-economic impacts. In addition to the economic multiplier effects already mentioned in the scoping chapter. This includes deadweight, leakage, substitution and displacement effects. This would provide a more robust assessment of the true socio-economic impacts of the scheme. The Industrial Strategy is the key national economic development document and the socio-economic assessment needs to show how the scheme aligns with it.
Adequacy of alternative options	Volume 1, Chapter 10	The scoping report states that a variety of scenarios will be used to assess the range of likely significant effects that could occur. This is an appropriate approach given the	-	See comments above re Rochdale Envelope approach and clearly setting out parameters and flexibility for each scheme element and

		number of uncertainties at this provided that a more clearly defined approach to the Rochdale Envelope (see comments above) is adopted.		environmental topic assessment.
Adequacy of consideration of cumulative effects	Volume 1, Chapter 10	The socio-economic chapter provides no details of likely socio-economic cumulative effects. It refers to the generic cross-topic text provided in Chapter 4.	-	The assessment should indicate the nature of likely cumulative socio-economic impacts as well as the projects that should be considered as part of the cumulative assessment.
Suitability and robustness of proposed mitigation measures (on site, off site and financial)	Volume 1, Chapter 10	-	The scheme has the potential to deliver significant positive socio-economic effects. Therefore, alongside the consideration of mitigation actions for addressing adverse effects, measures to maximise these positive effects (e.g. appropriate complementary actions) should be explored in consultation with HSPG.	HSPG to be consulted on complementary actions which could help maximise the positive socio-economic effects of the scheme for local communities and businesses.

Chapter 11 - Historic Environment				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Section 4.2.12, Table 4.3 and Table 11.8 (page 11.25).	Historic environment section does not state that Table 4.3 will be used in conjunction with Table 11.8. The historic environment assessment needs to identify where significant positive or adverse effects are Major or Moderate, to identify the most beneficial and harmful effects.	-	Request clarification that historic environment assessment will use both Table 4.3 and Table 11.8 in conjunction in the historic environment methodology.
	Volume 1, Section 11.4, Appendix 2, Fig. 11.1, Para 11.8	The Core Study Area boundary seems mostly realistic in relation to airport related development. However, it excludes the extent of the ZTV, which would be in the Wider Study Area. If a heritage asset is within a project's ZTV it is usually considered likely to be affected by both construction and operation, and the effects may be significant, depending on the nature of the asset and the change. 11.4.3 and 11.4.4 imply that in excluding the ZTV, the Core Study Area is sufficiently 'holistic' to identify the heritage assets affected during construction, where tall cranes and temporary structures may be erected. This is a departure from usual	Using ZTV to identify heritage assets for inclusion in the baseline that may be subject to significant construction effects would allow for appropriate mitigation for setting effects beyond the Core Study Area. This would also be the case with visual setting impacts within the ZTV beyond the Core Study Area (the	ZTV should be used to establish heritage assets impacted by construction as well as operation. Request that significant operational effects relating to visual changes to the settings of heritage assets beyond the Core Study Area, within the ZTV are included in the assessment.

		practice. Para 11.8 also states that within the Wider Study Area (including, according to the definition of the wider Study Area, the area covered by the ZTV) operational effects will only be assessed in relation to noise and vibration and not in relation to visual impacts. As the ZTV is a by definition visual, it seems inappropriate to exclude visual effects within the ZTV in the methodology	methodology currently excludes these).	
	Volume 1, Table 4.6 Summary Scope of the Assessment and Chapter 11	Methodology in relation to Setting: Terminology/phrasing used is potentially misleading. Setting changes are material changes in planning terms as well as physical changes. Therefore, in Table 4.6, under Historic Environment 'material' should be changed to 'physical'. Similarly setting changes are referred to as 'perceptual' changes. Setting guidance and previous decisions demonstrate that setting can also relate to former associations and former spatial relationships. Although appreciation is an important element of setting, using the term 'perceptual' may potentially exclude some elements of setting.	Addressing all setting related issues, including spatial relationships, may help capture design opportunities to respond to former relationships better	Suggest terminology changes are adopted in the EIA.
	Volume 1, Section 11.9.31	Paragraph 11.9.31 states that setting assessment is subjective. Setting impacts are assessed on the basis of the impact on the contribution of setting to significance and on the ability to appreciate the significance. Identifying how setting contributes in these respects provides a robust baseline from which to assess impacts with supporting evidence.	Failure to provide a robust, proportionate and logically argued analysis of the contribution of setting to the significance and appreciation of the assets in terms of the criteria set out in the guidance would provide an inaccurate assessment, and potentially inappropriate mitigation/design responses.	HSPG question whether the setting assessment is, as suggested in the scoping report, subjective and request that criteria for assessing the contribution of setting to the significance and appreciation of the assets in terms of the criteria within the guidance are clearly set out and argued in the assessment.
Alternative options	Volume 1, Chapter 11, General and 11.10.2	Historic environment mitigation does not extend to building design, just landscape design, interpretation, archaeology etc.	There may be opportunities for design of structures and layout, to respond to and reference historic environment significance. Especially the case with structures of airport related development and supporting facilities.	HSPG would expect to see enhancement through design references to heritage assets and building design and layout responses. Design should better reveal the significance of heritage assets and respond positively to historic character.
Scheme design	Volume 1 and	Form, massing, extent and/or exact location of car parking	Design and sensitive siting of these	HSPG would expect to see responsive

	Figures	and airport related development is outline and could potentially significantly impact nearby heritage assets. This is also the case with potential impacts to Colnbrook heritage assets/historic character from more offline A4 diversions south of the A4 and from river diversions from Assembly Option 1. Parameters of options around Stanwell also have potential to impact its heritage assets.	elements have the potential to preserve, enhance or harm significance, and it is vital that design of these elements responds to the specific nature of the heritage assets' character and significance, rather than being standardised. Interpretation of history and archaeology should be through building and public realm design and public art, as well as being through more conventional interpretative display and outreach programmes, etc.	nonstandard, detailed design around historic village cores and in areas where historic character survives, to enhance it and the sense of place and historic environment interpretation including public art, building and public realm design.
	General	The settings of any surviving areas of Harmondsworth village core would be significantly affected by the proximity of the runway. The design of structures and landscape beyond the north edge of the proposed airport boundary is vital to maintaining the significance of the village core.	Design should aim to robustly protect significance where large scale new development is immediately adjacent to village cores.	A more detailed design should aim to robustly protect significance where large scale new development is immediately adjacent to village cores.
Mitigation	-	-	Colnbrook village conservation area enhancement package – building upon the heritage mitigation scheme to achieve wider objectives to achieve rounded package of traffic management, environmental and social economic compensatory and mitigation actions. Similar will be appropriate in other local communities. HSPG seek not only mitigation but enhancement of this area, it is already prone to cumulative development pressures.	-

Chapter 12 - Health

Aspect	Volume/Report references	Questions and concerns	Proposed HSPG approach to address concerns	Summary
Summary scope of the assessment	Volume 1, Executive Summary, p. iv and Chapter 3 The DCO Report, p.3.15	No rationale provided as to why Rivers and Flood storage, operation phase has been scoped out, only construction phase is assessed.	Given climate change it is precautionary to make some assessment of implications of flooding during operational phase.	Ensure inclusion of Rivers and Flood storage in the health assessment of the operational phase to ensure that flooding issues take account of climate change and local communities as well as future developments around Heathrow over the next 20-50 years.
Policy context	Volume 1, 1. Introduction, p.1.14	Only Section 4 of the revised draft ANPS is mentioned. This section, like Chapter 12 Health, should also mention the paragraph in Section 1 and this specific point. The ANPS, June 2018, has this in Section 4 but also in Section 1, p. 11 states "The application should include and propose health mitigation, which seeks to maximise the health benefits of the scheme and mitigate any negative health impacts."	This sets out a clear strategic principle for the scheme that aligns with HSPG. This point is mentioned in the Health chapter but needs to be upfront as well.	There should be explicit mention of Section 1 and this particular sentence in the policy context.
Airport supporting facilities	Volume 1, 1. Introduction, p.3.17	Unclear why aviation fuel storage facilities have been scoped out from the community health assessment	There is potential for leaks as well as unforeseen events where the location of the aviation fuel storage could have adverse implications for local communities	Aviation fuel storage facilities should be considered as part of the health assessment.
Approach to assessment of impacts from waste (Table 4.5)	Volume 1, 4. Approach to EIA scoping, p.4.14, row on Environmental Impacts of New Waste Management Facilities	In the column on 'Key considerations raised by the revised draft ANPS', nothing is stated.	The ANPS (June 2018) gives a clear steer on the broad scope that should be used to assess community health and so key statements from the ANPS should be stated here.	This section should refer to para 1.37 of ANPS (June 2018) "The application should include and propose health mitigation, which seeks to maximise the health benefits of the scheme and mitigate any negative health impacts." And para 4.73 of ANPS (June 2018) "The applicant should identify measures to avoid, reduce or compensate for adverse health impacts as appropriate. These impacts may affect people simultaneously, so the applicant, the Examining Authority and the Secretary of State (in determining an application for development consent) should consider the cumulative impact on health."
Summary scope of assessment (Table 4.6)	Volume 1, 4. Approach to EIA scoping, p.4.18, row on Air Quality	For both construction and operation, there is no mention of in-combination or cumulative air quality related health impacts i.e. baseline (existing aircraft and roads) plus scheme construction plus other development in the neighbouring areas.	This is a key inconsistency in the document, it is mentioned (again inconsistently) in the Health chapter	Explicit mention for both construction and operation, of in-combination or cumulative air quality related health impacts
Summary scope of assessment	Volume 1, 4. Approach to EIA scoping, p.4.22,	Only health and safety impacts of extreme weather/climatic events during the construction phase are considered.	There are likely to health and safety impacts on visitors and users of the airport in extreme weather/climatic	This needs to be assessed in more detail before being scoped out.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
(Table 4.6)	row on Climate Change		events and possibly local communities as well during the operational phase	
Summary scope of assessment (Table 4.6)	Volume 1, 4. Approach to EIA scoping, p.4.25, row on Health	No mention that impacts will be separated out into local and wider community beneficial impacts to recognise the differential and unequal (inequitable) impacts on local people compared to those living further away (those living further will mostly/wholly experience the positive impacts). <u>Living conditions: Construction and Operation</u> No mention of impact on local house prices during both construction and operational phases. No mention of potential difficulties in selling homes during construction and early operational phases. Living conditions should remain a theme for the operation phase. Its removal shows that this theme is only about relocation of some residents and hence not about local living conditions but simply about resettlement. <u>Safety: Construction and operation</u> This should be part of both construction and operation not just operation. <u>Assessment of key health outcomes</u> There is no mention of assessing the effects on four of the five main health outcomes of any scheme – non-communicable disease (heart disease, respiratory disease), mental health and wellbeing, injury and nutritional disorders (obesity) [communicable disease - in the UK context - is only relevant in terms of global epidemics e.g. SARS]. Mental health and wellbeing should be the term used not just wellbeing, which is too broad and as defined in the scoping report is decoupled from the fact that adverse effects on wellbeing can lead to mental health/ill health effects. <u>Receptors</u>	This is about protecting community health and making a full and well considered assessment of health impacts. It is important that the health assessment recognise and assess effects with the understanding that the adverse impacts and beneficial impacts fall on different groups of people. They cannot be summed. The themes under Environment should be under Living Conditions and the theme Environment should be removed. This would more logical and connect up key in-combination impacts and associated health effects. There needs to be a stronger focus on health outcomes as this is lost in the generic themes that will be used to assess health impacts.	An explicit statement should be added in the health assessment to clarify the fact that in general negative impacts are likely to be experienced by local residents and the positive benefits likely to be experienced by people living further away using or being employed in the airport. Review of determinants/themes used to make them more consistent and more aligned to community concerns and needs. The health assessment should consider the health and wellbeing impacts of: - Changes in local house prices during both construction and operational phases. - Difficulties in selling homes during construction and early operational phases. Safety issues should be considered as part of both construction and operation. There should be explicit mention that the health assessment will consider the key health outcomes: non-communicable disease (heart disease, respiratory disease), mental health and wellbeing, injury and nutritional disorders (obesity). Mental health and wellbeing should be the term used not just wellbeing which is too broad and as defined in the scoping report is decoupled from the fact that adverse effects on wellbeing can lead to mental health/ill health effects. The following receptors should be included:

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		Users of the airport Airport staff/ People who work in the airport (this is the bigger group to benefit and most of these will not be local residents) Visitors to the local area Open, green and play spaces		<u>Receptors</u> Users of the airport Airport staff/ People who work in the airport (this is the bigger group to benefit and most of these will not be local residents) Visitors to the local area Open, green and play spaces
Summary scope of assessment (Table 4.6)	Volume 1, 4. Approach to EIA scoping, p.4.27, row on Land Quality	No mention of in-combination and cumulative impacts on health.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Explicit mention of in-combination and cumulative health impacts.
Summary scope of assessment (Table 4.6)	Volume 1, 4. Approach to EIA scoping, p. 4.28, row on Major Accidents and Disasters	Accident and disaster plans for the airport need to be updated to include the construction and operational phases as part of mitigation proposals.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Explicit mention that accident and disaster plan for the airport will be updated to include the construction and operation phases as part of mitigation proposals.
In-combination effects	Volume 1, Approach to EIA scoping, p.4.37-4.37, 4.7 In-combination effects	Paragraph 4.7.1 defines in-combination effects narrowly as effects on a single receptor at one point in time, however this does not take into account in-combination effects over long periods of time. Paragraph 4.7.2 states that impacts are rarely additive. From a public health perspective in-combination health effects are either additive or synergistic (in most situations). Some health effects can be quantified using recognised UK or international methodologies e.g. air pollution and noise. Therefore, it is unclear what is meant by "a collection of impacts need to be drawn together in a meaningful way"	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts. The definition for in-combination effects should be "the combined environmental impacts/effects from the DCO project on a single receptor at a single point in time or over a period of time". This would ensure that the assessment of in-combination impacts/effects took account of single point, intermittent predictable, intermittent unpredictable and continuous effects (short, medium and long term. Where necessary HSPG should ensure that if required the EIA	Recommend changing definition to be broader so a more holistic analysis of in-combination impacts can be undertaken. Ensure that the scope allows HSPG to request that the modelled changes in air quality and noise be quantified into estimated changes in key health outcomes if needed.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
			undertakes quantification. This is likely only to be useful in specific cases e.g. effects on a school. This is because there is some evidence that indoor air in schools is worse than local outdoor air pollution. See, Indoor air quality in London's schools report.	
Air quality and odour	Volume 1, 5. Air quality and odour, p.5.27-5.28, Table 5.8 Likely significant air quality and odour effects	No mention of potential health effects on people (especially children) using open, green and play spaces. No mention of sensitive receptors such as the elderly, those with existing respiratory conditions and young children (it is mentioned in the Health chapter).	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Explicit mention of potential effects on people (especially children) using open, green and play spaces. Explicit mention of sensitive receptors such as the elderly, those with existing respiratory conditions and young children.
Climate change	Volume 1, 8. Climate change, p.8.15 Table 8.3 Likely significant climate change effects	Extreme weather events are only considered for the construction phase and not the operation phase. They should be considered for both. The potential health impacts of these events would be on local communities, airport staff, users of the airport, and visitors to the local area. Not sure why 'Changes in seasonal patterns of rainfall, temperature and wind resulting in changes in air quality exacerbating health and safety impacts' is only in the operation phase. It would also apply to the construction phase.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Recommend that extreme weather events are considered for both the construction phase and operation phase. Ensure that the full range of receptors is considered: local communities, airport staff, users of the airport, and visitors to the local area. Changes in seasonal patterns of rainfall, temperature and wind resulting in changes in air quality exacerbating health and safety impacts' also applies to the construction phase
Climate change	Volume 1, 8. Climate change, p.8.20, Construction and operation assessment methodology	Paragraph 8.9.11 should also include the WHO report, Promoting health while mitigating climate change.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriate analysis the community health impacts.	Request that Paragraph 8.9.11 should also include the WHO report, Promoting health while mitigating climate change
Health Likely	Volume 1, 12. Health, p.12.16-	As mentioned earlier in the comment on the summary of the scope:	This is about protecting community health and ensuring the health	As stated previously, an explicit statement should be added in the Health assessment to

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
significant health effects	12.17, Table 12.3 Likely significant health effects	No mention of the fact that impacts will be separated out into local and wider community beneficial impacts to recognise the differential and unequal (inequitable) impacts on local people compared to those living further away (those living further will mostly/wholly experience the positive impacts). <u>Living conditions: Construction and Operation</u> No mention of health impact of changes in local house prices during both construction and operation phases. No mention of the health impact of potential difficulties in selling homes during construction and early operation phases. The environmental theme is really better seen as living conditions. Currently, Living Conditions theme is really about Resettlement. <u>Safety: Construction and operation</u> This should be part of both construction and operation not just operation. <u>Assessment of key health outcomes</u> There is no mention of assessing the effects on four of the five main health outcomes of any scheme – non-communicable disease (heart disease, respiratory disease), mental health and wellbeing, injury and nutritional disorders (obesity) [communicable disease - in the UK context - is only relevant in terms of global epidemics e.g. SARS]. The human set of receptors is mentioned in 12.9.24, p. 12.23 but not elsewhere: “The general population scope of the health assessment considers: residents of and visitors to local communities (in the inner and wider study areas); the workforce and passengers of Heathrow (current and future); and construction workers for the DCO Project. However, the focus is on community effects.”	assessment is holistic and fully and appropriately analyses the community health impacts.	clarify the fact that in general negative impacts are likely to be experienced by local residents and the positive benefits likely to be experienced by people living further away using or being employed in the airport. Undertake a review of determinants/themes used to make them more consistent and more aligned to community concerns and needs. The health assessment should consider the health and wellbeing impacts of: - Changes in local house prices during both construction and operational phases. - Difficulties in selling homes during construction and early operational phases. Safety issues should be considered as part of both construction and operation. There should be explicit mention of the fact that the health assessment will consider the key health outcomes: non-communicable disease (heart disease, respiratory disease), mental health and wellbeing, injury and nutritional disorders (obesity). Mental health and wellbeing should be the term used not just wellbeing which is too broad and as defined in the scoping report is decoupled from the fact that adverse effects on wellbeing can lead to mental health/ill health effects. The following receptors should be included: <u>Receptors</u> Users of the airport Airport staff/ People who work in the airport

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		Receptors Users of the airport Airport staff/ People who work in the airport (this is the bigger group to benefit and most of these will not be local residents) Visitors to the local area Open, green and play spaces		(this is the bigger group to benefit and most of these will not be local residents) Visitors to the local area Open, green and play spaces
Health Health impacts and mitigation of health impacts of flooding	Volume 1, 12. Health, p.12.18, Paragraphs 12.8.3 and 12.9.20	Taking a precautionary approach, flooding (assessment and mitigation) should be part of the assessments; as with climate change, potential flooding would create a public health emergency in the area and Heathrow would be an important stakeholder in supporting the management of any local flooding. Flood risk management plan and how Heathrow will link in with other emergency services, especially health services, should be part of the mitigation. A public health perspective is needed alongside the review by the Environment Agency. This should be provided by the HIA team and/or Public Health England as the appropriate statutory agency working at the same level as the Environment Agency.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Recommend that flooding (assessment and mitigation) should be part of the assessments; as with climate change, potential flooding would create a public health emergency in the area and Heathrow would be an important stakeholder in supporting the management of any local flooding. Flood risk management plan detailing how Heathrow will link in with other emergency services, especially health services, should be part of the mitigation. A public health perspective is needed alongside the review by the Environment Agency. This should be provided by the HIA team and/or Public Health England as the appropriate statutory agency working at the same level as the Environment Agency.
Health Transparency in assessing complex impacts	Volume 1, 12. Health, p.12.19, Paragraph 12.9.5	The health assessment will need to assess individual components of the development and then develop a combined assessment of significance. For transparency of these individual components of the DCO will need to be assessed separately e.g. using a health impact table/matrix.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	The health assessment will need to assess individual components and then develop a combined assessment of significance. For transparency of the assessment key individual components of the DCO will need to be assessed separately e.g. using a health impact table/matrix.
Health How other assessment findings link into the health assessment	Volume 1, 12. Health, p.12.20, Paragraph 12.9.9	Unclear what is meant by “applied in the health assessment”, it should be informed by as the health assessment taking the findings of these assessments into account may judge that some aspects are significant even if these other assessment do not judge them significant.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriate analysis the community health impacts.	Clarify what is meant in this paragraph. The other specialist assessment should inform the health assessment and should not be applied without reflection and critical review into the health assessment.
Health Uncertainty of health	Volume 1, 12. Health, p.12.22, Paragraph	Unclear where the uncertainty lies; Is it an uncertain relationship between a project activity and heath outcome, and hence uncertainty of the possibility or likelihood of the health impact?	This is about protecting community health and ensuring the health assessment is holistic, and fully and	Clarify what is meant in this paragraph.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
pathway relationships and impacts	12.9.16	Adopting a precautionary approach to the assessment will help address uncertainty.	appropriately analyses the community health impacts.	
Health Precautionary approach	Volume 1, 12. Health, p.12.23, Paragraph 12.9.18	The assessment is either precautionary or it is not (i.e. pragmatic in this context implies non-precautionary). Iit cannot be both. It is strongly recommended that the approach is precautionary. The second part of this paragraph, is an obvious point and it is unclear why it is made here.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analysises the community health impacts.	The scoping report and EIA must take precautionary approach that is consistently applied across the whole scoping report and EIA.
Health Assessing significance	Volume 1, 12. Health, p.12.23, Paragraph 12.9.21	The full analysis of the health impacts should consider impacts that are moderate and then analyse whether these have the potential for significant in-combination or cumulative impacts/effects. Similarly potential cumulative impacts linked to other projects in the locality need to be considered?	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	The health assessment must consider, and not scope out, health impacts that are moderate. These moderate impacts must be discussed in the environmental statement and then analysed in terms of whether these have significant in-combination or cumulative impacts/effects. The health assessment must consider the cumulative impacts linked to other projects that are likely to occur in the locality.
Health Population scope	Volume 1, 12. Health, p.12.23, Paragraph 12.9.24	The meaning of the statement specifying the focus will be on “community effects” is not clear. Does this mean the assessment is not holistically considering all human receptors and will narrowly focus on immediate local residents?	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Clarification on what is meant by a focus on community effects. The whole focus of the health assessment is on the community.
Health In-combination effects and cumulative effects	Volume 1, 12. Health, p.12.24, Paragraph 12.9.27	What about reporting of cumulative impacts? These should also be considered in the Health assessment and presented in brief in the health chapter. This is mentioned in 12.9.7 but not mentioned in 12.9.27	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Both in-combination and cumulative impacts should also be considered in the health assessment and presented in brief in the health chapter (and in detail in the separate cumulative assessment chapter).
Health Exposure-response relationships	Volume 1, 12. Health, p.12.25, Paragraph 12.9.30	This is not an accurate statement. Exposure-function is a typo it seems. Exposure-response functions (relationships) for quantifying health impacts can be used when there is expert consensus (WHO) and sufficiently strong evidence from rigorous studies.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Paragraph should be amended so it is scientifically accurate and include the fact that DEFRA has developed guidance on noise quantification.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		The issue of chance, bias and confounding applies only to the studies that inform the expert consensus. There is DEFRA guidance on noise quantification.		
Health Quantitative analysis	Volume 1, 12. Health, p.12.25, Paragraph 12.9.31 and Table 12.5	Does this mean that the health assessment will use the quantitative modelling findings to inform the health assessments qualitative judgment of impact and significance? Or does this mean that a quantitative analysis of the health outcomes will also be undertaken using exposure? The air quality and noise chapters do not discuss quantifying health outcomes. The Air Quality and Noise Expert Groups should inform the health assessment on this aspect.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Ensure that HSPG can request a quantification of the health outcomes of modelled changes in air quality and noise, if deemed appropriate, particularly for sensitive receptors like schools.
Health	Volume 1, 12. Health, p.12.26-28, Table 12.6	These rows should be linked to physical health outcomes as well as mental health and wellbeing: Relocation as a minimum should be linked to mental health and wellbeing. The effects of noise and air quality on cardiovascular and respiratory health (as with changes in local traffic in Lifestyle row, there is no threshold effect for air quality and for aircraft noise on learning and cognition) should be examined. Employment is linked to cardiovascular health. Given a precautionary approach and that there is reasonable evidence of a health pathway, physical as well as mental health and wellbeing effects should be considered in the health assessment.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	The Living conditions, Environment and Economy rows should mention both physical health outcomes and mental health and wellbeing
Health	Volume 1, 12. Health, p.12.29, Paragraph 12.9.1	The assessment should use a matrix approach to analyse the nine criteria (ticks and crosses) to be transparent about the qualitative professional judgment used for each category to determine significance of impacts. Non-significant moderate impacts should be reported. Particularly as Paragraph 12.10.3 states that:	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	There should be an explicit analysis of the nine dimensions used to determinant level of impact.

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Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		"The application of mitigation measures will not be limited to health effects that have been identified as being 'significant'."		
Health Criteria for scientific evidence set too high	Volume 1, 12. Health, p.12.30, Table 12.7	Given a precautionary approach, the bar for scientific evidence is being set too high. How is sufficient defined and decided? Who decides this? The threshold should be based on the balance of probabilities i.e is there a reasonable chance for the health effect to be experienced by a given population.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts. The methodology sets a high scientific bar for what can be considered a likely health impact, that goes against the stated precautionary approach taken by in the scoping report and health assessment.	This paragraph should be re-worded to say: "Is there a plausible health pathway, outcome or determinants with some good quality scientific evidence to support the link between…….?"
Health Approach to determining significance	Volume 1, 12. Health, p.12.30, Paragraph 12.9.3	This paragraph should add that a precautionary approach will be used to judge significance.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	This paragraph should also say explicitly that a precautionary approach will be used to judge significance.
Health Reporting of moderate impacts not just major impacts	Volume 1, 12. Health, p.12.32, Paragraph 12.9.4	HIA good practice advocates transparency of judgment for stakeholders so that the number and range of moderate impacts are clear; all moderate impacts should be reported. Discretion and professional judgment will need to be used as some moderate impacts could be deemed significant. As stated previously in-combination moderate impacts can lead to a significant impact. This is not considered in this assessment criteria checklist.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyse the community health impacts.	Moderate impacts should also be discussed alongside major impacts in the health assessment chapter and HIA report appendix.
Health Mitigation proposals	Volume 1, 12. Health, p.12.34, Paragraph 12.10.5	The proposals are very general: There is no mention of: - protecting and enhancing open, green and play spaces, - protecting and enhancing social capital and cohesion - identifying those worse affected/vulnerable and providing additional support for them - working with local communities to deal with complaints and grievances over the construction and operation phases	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Include the following broad proposals: - protecting and enhancing open, green and play spaces, - protecting and enhancing social capital and cohesion - identifying those worse affected/vulnerable and providing additional support for them

Chapter 12 - Health				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		- supporting local schools with educational, training and employment opportunities		- working with local communities to deal with complaints and grievances over the construction and operation phases - supporting local schools with educational, training and employment opportunities
Health Population and human health	Volume 1, 15. Major accidents and disasters, p.15.11, table 15.4	The row Population and Human Health should include Chapter 12: Health	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	The row Population and Human Health should include Chapter 12: Health
Community Appendix 9.2	Volume 3, pdf pages 969-979 Index of multiple deprivation	These are useful high level maps. However, there is a need for more zoomed in maps and identification of the wards where 10% and 20% most deprived areas are located, to better inform the health assessment and its analysis of inequalities and inequity.	This is about protecting community health and ensuring the health assessment is holistic and fully and appropriately analyses the community health impacts.	Zoomed in deprivation maps and identification of the wards where the 10% and 20% most deprived areas are located would be useful to better inform the health assessment and its analysis of inequalities and inequity.

Chapter 13 - Landscape and visual amenity				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
Adequacy of EIA Methodology	Volume 1, Chapter 13 Appendices and Figures for Chapter 13.	**Scoping Report:** Reference is made to current guidance, relating to and Landscape and Visual Effects Assessment guidance (IAN 135/10). Note recent changes to this guidance. **Appendices:** There is no background or baseline information relating to landscape in the Appendices. Given that baseline work and field study has been initiated in 2017, it would be useful to see this early work recorded, noting of course there will be a need to return and review the study as the schemes become more progressed. A Landscape Constraints Plan provides a preliminary ZTV, representative viewpoints and designations but does not yet illustrate local Landscape Character, or Protected view	There are many strands that are cross cutting and this project gives a unique opportunity to review the landscape issues across a series of authorities. Identifying criteria for design exploration could include the following: • London Green Grid • General plan of localised published landscape character variation. • Vegetation and open space lost and quantified	Integrate additional considerations into the design including London Green Grid, landscape character variations, vegetated and open space areas ad land requiring remediation. Provision of a GIS baseline that provides a mapped series of assets across all the HSPG boroughs.

Chapter 13 - Landscape and visual amenity				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
		corridors.	in terms of areas within the DCP scheme area. • Areas in need of management of distinctly similar themes, e.g., land requiring remediation or in a degraded/despoiled condition or character; essentially these are future opportunity areas.	
Landscape Characterisation	Volume 1, Chapter 13	The report identifies and quotes extracts from the National Character Area, NCA 115, Thames Valley, but does not to set out the local borough character mapping, which would be expected at the assessment stage.	Develop a full plan of the local published character areas, highlighting where the opportunities exist for management especially in areas of lesser quality or urban/degraded landscape, as a tool to identify off-site improvements.	HSPG to be consulted on these issues during PEIR review period.
Viewpoints	Volume 1, Chapter 13	The viewpoints are still to be finalised and agreed with Borough Landscape Officers. The land to the west of London is generally flat and the responses from Colne Valley Regional Park highlight this and the concerns for visibility. Once agreed, 'existing' and 'after' views along a suitable timeline (e.g. Years 0, 1 and 15), with consideration of the changes between winter and summer, need to be set out in the method, perhaps highlighting where these are going to be of greatest interest.	Review the Harmondsworth View to consider views the open space, Harmondsworth Moor and settlement areas, to ensure the loss of viewpoints is noted, as well as change in views. Viewpoints within the CVRP are set out in 'All London Green Grid: 10, River Colne and Crane Area Framework; note that one of these views would be lost to the proposals. The proposal needs to provide new potential viewpoints (which are recreational and related to design of new spaces as part of a visual framework for the masterplan.)	Request confirmation of viewpoint agreement, with the Boroughs Landscape Officers, a composite plan and requirements for visualisation to be explored to achieve a pragmatic set of representative viewpoints. Develop and share a 3D model for visualisation of the scheme, to be developed to assist in conveying the proposals, and as a cost-effective means of reviewing views from different receptor viewpoints.
Protected Views	Volume 1, Chapter 13	No reference to any protected view corridors, which should be highlighted or excluded. The 87m tower will be visible from parts of outer London and elevated viewpoints within the nearby boroughs. This will similarly be an issue from Windsor and Slough's elevated viewpoints, e.g. viewpoints No. 17, 20 and 23.	Review the Richmond Planning sources and the King Henry's Mound Viewing Platform. This is a protected viewing point towards St. Paul's in London, but views west are noted towards both Windsor Castle /	Review views westwards from selected high points in outer London (Richmond Policy DMHD7) and protected views or views within and surrounding Windsor.

Chapter 13 - Landscape and visual amenity				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
			Albert Bridge and Heathrow, part of which would include the new 87m tower.	
Alternative options .	Volume 1, Chapter 13, Section 3.10.2	Reference is made to the different options and the requirements in relation to construction and operation landscape and visual measures, but they are not specific yet.	There is potential to consider a tabular alterative layout to give an indication of the potential landscape and visual effects, perhaps to assist in determining the greater spread of visibility of one option. Consider the potential for off-site enhancement to add value as renewed landscape infrastructure in areas of degraded landscape, as well as providing visual amelioration.	Review the options in terms of loss of landscape elements and quality/value.
Scheme design	Figure1.2, Annex B of the revised draft ANPS.	Loss of assets to the north and south - including open space, landscape components, severance of PRoW - their function and uses and value to the wider neighbourhoods of Harmondsworth, Sipson to the north and Stanwell to the south-west. For these it is not clear where re-provision of open space will be located and if it provides the same accessibility and amenity to the neighbourhoods it formerly served. The same principle would apply to lakes or water features as landscape components, although this is possibly covered elsewhere. Upstream flood compensation areas need to be included in the masterplan and their capacity for providing other habitat or open space roles explored. Areas in need of management of distinctly similar themes, e.g., land requiring remediation or in a degraded/despoiled condition. The masterplan needs to embed the ecological measures, which will emerge as the assessments are completed.	There is no obvious re-provision of open space or landscape components to the south-west at Stanwell, this needs to be addressed. Understanding the rationale for the re-provision of all types of open space and parkland to meet need in terms of accessibility.	Provide a strategy which sets out the equivalency of open space and a rationale for its location to demonstrate that the land for open space is on an 'equally advantageous' basis (as embedded in the DCO land acquisition process) with clear criteria for why it is acceptable.

Chapter 14 – Land quality				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1 Chapter 14, Volume 3 Appendix 14.1	Proposed methodology for assessing land quality issues is fully compliant with current guidance and industry best practice. Land quality has been included in the EIA scope for all construction aspects and most operational aspects. It has been excluded from the operational stages of road construction and public transport which is considered to be appropriate. Scoping report has been based on a conventional desk study which has been undertaken in accordance with relevant published guidance and industry best practice.	There is opportunity for a number of local contaminated sites to be remediated, including multiple dilute and disperse landfills, as part of the airport expansion. HSPG would like to see remediation of these sites incorporated into the mitigation package.	Integration of landfill remediation into the mitigation package for the scheme including commitments to specific sites.
Alternative options	Volume 1, Chapter 14	The proposed scope of the assessment considers all land within the DCO boundary plus a 500m buffer which is considered to be appropriate.	-	The spatial coverage of the land quality section is considered sufficient to encompass all appropriate alternative options.
Mitigation	Volume 1, Chapter 14	Proposed approach to development of mitigation measures is considered to be appropriate and consistent with relevant published guidance e.g. CLR 11.	-	-

Chapter 15 – Major accidents and disasters				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 15, Appendix 15.5	HSPG are generally satisfied with the approach to assessment of Major Accidents and Disasters, including the types of incident to be included and excluded within the assessment which seems reasonable and logical.	At PEIR stage it would be expected to see an indication of the receptors which could potentially be affected by each potential type of incident.	At PEIR stage it would be expected to see an indication of the receptors which could potentially be affected by each potential type of incident

Chapter 16 – Noise and vibration				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 16	The methodology describes 8 different assessment years, but it is not clear which comparisons will be made to consider all of the effects. Certain comparisons could give rise to more/less adverse impacts. Two different aircraft noise calculation methodologies are noted, but it is not clear why two are needed. For non-residential receptors it is stated that annoyance would be assessed for operational noise. For construction noise disruption of function/cognitive impairment is also assessed – this also needs to be assessed for operational noise. The assumptions on future flight paths may be key in determining if operational impacts are significant or not. The LOAEL and SOAEL Table 16.7 currently includes a non-specific maximum criterion for aircraft noise "L_{Amax}/number of events and a risk assessment of objective sleep disturbance". An appropriate L_{Amax} value should be inserted to ensure the is not ambiguous.	The EIA methodology indicates that study areas would be expanded where it is clear that LOAEL is exceeded at the currently expected study areas. This could be an opportunity to ensure that impacts are picked up in wider areas. It is proposed that the L_{Amax} parameter is also considered for night-time construction works to protect against sleep disturbance. It was not clear that the engine testing facility will be included in "maintenance". It is also not clear if engine testing noise will be assessed under ground noise or fixed noise sources. It is proposed that engine testing noise should be assessed as a fixed noise source in accordance with BS4142.	In general the assessment methodology and criteria are considered appropriate, but clarification required on the issues raised here to ensure a robust methodology is adopted.
Alternative options	Volume 1, Chapter 16	The Airspace Change Process (ACP) is proposed to be developed separately, and will continue after the DCO process has concluded the PEIR will need to be based on a number of indicative flight path options that will be further refined. The scheme parameters to be assessed should be based on the 'worst case' combination of scheme elements including worst case flight paths. It is not clear how impacts would be assigned as a result of DCO or ACP processes.	Worst case scheme parameters to be adopted in the assessment in relation to flight paths.	Worst case scheme parameters to be adopted in the assessment in relation to flight paths.

Cumulative effects	Volume 1, Chapter 16	Some of the displaced activities (paragraph 3.3.37) would appear to be essential activities to the operation of the airfield, and these are combined into cumulative effects.	In general, it is accepted that cumulative impacts will be assessed qualitatively. However, in some instances it may be feasible to combine inter-project contributions quantitatively rather than qualitatively i.e. contribution from road, rail and aircraft.	Quantitative approaches to cumulative assessment in relation to noise should be explored and justification for a qualitative/quantitative method justified.
Mitigation	Volume 1, Chapter 16	The Scoping report states that mitigation in the form of noise insulation will be considered. It is not clear how this will be considered where existing properties already have noise insulation.	If the project is taking existing noise insulation into account, HSPG would expect to see verification that noise insulation is still working as intended in those properties.	If the project is taking existing noise insulation into account, HSPG would expect to see verification that noise insulation is still working as intended in those properties.

Chapter 17 – Traffic and transport				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 17, Section 17.9.17	The methodology references the Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment, 1993). Following recent correspondence with the Institute of Environmental Management and Assessment (IEMA) we have been advised these guidelines should be treated with a 'health warning.' Whilst the Guidance remains the most current version, many sections are out of date. It also does not cover topics which have become more prominent since 1993 such as Health. A greater use of professional judgement is also now advocated in place of the previous 'threshold based assessment.'	Recognising that there can be limitations to the accuracy of a traffic model the lower down the roads hierarchy, it may be appropriate for HSPG to provide HAL with guidance with respect to sensitive or heavily congested locations in each respective Borough/ Council area.	A list of sensitive areas on the local road network (this can reflect congestion levels, road safety, potential rat-runs or economic importance) should be developed in conjunction with HSPG so that these can be incorporated into the baseline conditions to be considered by Heathrow. We note the ES Scope states at Chapter 17, para 17.8.1 that *"no effects have been scoped out of the assessment",* however the prescriptive use of the thresholds outlined in the IEA Guidelines may potentially scope out sensitive locations due to the simplistic nature of this approach. As advised by IEMA, care should be taken and greater emphasis ought to be placed on professional judgement when considering the significance of an effect in terms of changes in traffic volumes. [*For example, a 1% increase in traffic on a congested network may have a high impact whereas a 10% increase in traffic on a lightly*

				trafficked road may not]
Mitigation	Volume 1, Chapter 17, Section 17.10.14 "…Heathrow would be committed to securing the necessary mitigation to address the impacts of the DCO Project."	-	-	The Scoping Report states that there is a commitment to providing the necessary mitigation to offset the impacts provided that it is demonstrated through the EIA and TA process. HSPG to be consulted to ensure traffic and transport impacts are fully identified and appropriately mitigated. Bespoke plans may be required to specify some of the mitigation proposals for example a Construction Traffic Management Plan and a Construction Workforce Travel Plan.

Chapter 18 – Water environment – surface water aspects				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**

EIA Methodology	Volume 1, Chapter 18, Baseline sections	No indication in the main text of the current status and objectives of the water bodies in the study area. No reference to derogations for disproportionate costs for phosphate (currently Poor for example in some water bodies). Section 8.6.41 Protected Sites - those with water dependence should be listed as they (should) have Very High sensitivity (for water). No reference has been made to main rivers and ordinary watercourses - so HSPG partners have no clear picture of which attributes they may have responsibility for. Table 18.8 (impacts) does not identify nutrients as a likely impact (nutrients are the focus of modelling described in the surface water assessment in Appendix 18.3) - all those identified are a result of construction or changes to source water (i.e. another catchment from diversion or change in baseflow dilution) or air deposition (from increased aviation. None of these warrant the modelling for nutrients (laid out in Appendix 18.3). No focus on the likely substances to be found in runoff: • Construction - sediments, oils and chemicals from spillage - all controllable by best practice. • Operation - de-icer, herbicides, pesticides, some metals. All related to intermittent - should follow a risk based approach - look at what is draining where and what is likely to be in that catchment - what SUDs and other mitigation should be applied.	Provision of a table to show the current status and objective of the water bodies and their sensitivity/importance so that the significance of any impacts can start to be gauged (need this to be able to scope attributes in or out). Modelling for nutrients is not considered an appropriate method of identifying potential impacts as nutrients do not represent a likely impact of the scheme. Substances likely to be found in runoff need to be addressed in the assessment methodology. Significance criteria should follow standard guidance, for example DMRB in particular for road components, and criteria needs to be more detailed than the coarse High/Med/Low approach suggested at present. Main rivers and ordinary watercourses should be identified in the assessment.	It is considered that there are significant flaws in the methodology proposed which does not adhere to best practice guidance and appears to adopt methods which are not relevant to the types of issues likely to be associated with the proposal. HSPG recommend a full review and update of the proposed assessment approach for surface water issues as it is currently not considered fit for purpose.

	Volume 1, Chapter 18, Approach	Sensitivity of receptor is coarser than the norm - just High/Med/Low; approach is not based on WebTAG or DMRB (DMRB uses Very High as an additional level for designated/sensitive sites) Descriptions of sensitivity and impact are not based on well used methods like WebTAG or DMRB. E.g. EQS used for low impact but not cited in other categories. DMRB needs to be followed for all the road aspects of the design (not even mentioned) - it would be best to focus on this approach for the runway areas too (i.e. rainfall linked drainage to outfalls). Whole approach is taken as if for new continuous discharges - i.e. WWTW where the make-up of the discharge is better understood. Using P as a surrogate seems to be a hangover from default description of modelling for WWTWs.		

	Volume 1, Chapter 18 Mitigation	Mitigation is not well covered - it refers to Section 3 for drainage, but there is very little information provided. Overall, there is no attempt to value the baseline or gauge the magnitude of likely effects. The assessment methods do not appear to be lined up with the impacts that are expected and could be misleading - for example large scale modelling of nutrient budgets is not going to show intermittent quality issues for sediment, de-icer and potential metal/plastics contamination. Sanitary/ continuous discharges are likely to be treated by Thames Water as current, so should have no direct permit for discharge to receiving waters	Reference should be made to current drainage balancing and treatment in the baseline and how this will be employed for the extension. Information on the type of drainage features they may have to adopt and maintain. All the receiving water re-alignments and diversions will have to take account of WFD and will require enhancements and offsetting. The report should be more explicit on this. Instead of nutrient modelling, focus should be on SUDs drainage and pollution prevention that will alleviate the majority of impacts. It is unclear as to why reservoir and lake modelling is focusing on nutrients? This approach seems to be driven by compliance for the SPA but is likely that there will be limited nutrients from Heathrow? It is recommended that the conceptual model should just link standing water to the source water – as most of the embanked reservoirs will be pumped from nearby rivers. If there is a pathway from the project/source risk from the project then consider modelling. Using SIMCAT for construction impacts may not be the best approach - best practice pollution prevention should be applied as it is a risk assessment for spillages and potential incidents.	
	Volume 1, Appendix 18.3 - Surface water assessment	New continuous discharges should be small scale and covered by EPA permit so modelling is probably not required beyond RQP. New intermittent discharges should be controlled by attenuation and addition of best practice SuDS features to pick up WQ issues, allow drainage to be isolated in emergency etc - again it may not be necessary to model this?	-	

Scheme design	-	-	Rivers/water courses are addressed and intertwined with runway, roads, etc. The enhancement of Green and Blue infrastructure (including habitats, biodiversity and access routes for recreation) should be approached as design objectives / principles and not left to deal with the consequences of other decisions. Rivers will need to be culverted but the Colnbrook should be retained as an open channel with as much of other water courses remaining as open channels. Rivers, water bodies and storage are interconnected systems and need to be considered on a macro scale - diversions at one point will have impacts at another. Need information and clarity on what happens with surface water run-off and any exceptional release of polluted waters.	-
Chapter 18 – Water environment – groundwater aspects				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA methodology	Volume 1, Chapter 18, Water environment Appendix 18.1 WFD compliance assessment methodology Appendix 18.2 Numerical Groundwater Modelling Method Statement Appendix 18.4 Flood Risk Assessment Method Statement (groundwater sections)	<u>Monitoring</u> Monitoring groundwater levels in the gravels across the areas of interest and adjacent to water courses is essential. This is referred to briefly in Table 18.10 and in Appendix 18.2. Baseline monitoring should be for at least 1 year in order to provide sufficient data for conceptualisation and model calibration. <u>WFD groundwater bodies</u> The list of water bodies to be considered for WFD compliance in Appendix 18.1 includes only one groundwater body – Lower Thames gravels. However, Appendix 18.2 suggests there is also a risk to the Chalk e.g. in listing the potential environmental receptors in Table 18.2.1, or e.g. text in Section 5.4 (of 18.2) which refers to "interaction with the deep subsurface" and that "some elements of the Project may sit beyond the spatial extent of the Lower Thames Gravels Groundwater Body (e.g. to the north, where the Cretaceous Chalk is unconfined)." Chapter 18 of the main report also refers to potential impacts on the Chalk as well	Further detail would be expected on groundwater monitoring in future scoping report and PEIR. Potential effects in relation to the Chalk should be included in the assessment, or justification provided for scoping out. In relation to WFD compliance assessment, the assessment should be presented as results for individual tests. The extent of the groundwater modelling and gravel aquifer should be shown on a plan. The scale at which it is appropriate to use the model Groundwater flood risk model will need further consideration.	Overall approach to groundwater aspects appears reasonable. HSPG would expect to see the clarifications listed here addressed in the future scoping report and PEIR.

		as gravels. WFD groundwater tests With regard to the approach to WFD compliance, screening and detailed assessment (Section 6 and 7 of Appendix 18.1), it would be more transparent if the groundwater assessment is presented as results for each individual test, rather than just overall quantitative and overall chemical effects (e.g. for quantity: Saline or other intrusions, surface water, GWDTE, water balance). Extent of groundwater model Figure 18.2.3 in Appendix 18.2 does not show the proposed extent of groundwater modelling, nor the extent of the gravel aquifer. Groundwater flood risk modelling Appendix 18.4 gives a brief account of how groundwater flooding risk will be assessed, referring to use of the groundwater model. The scale at which it is appropriate to use the model will need consideration, as it may not work well for local scale flood issues (this is mentioned in Appendix 18.2). Careful interpretation of model outputs will be required. Document formatting Appendices 18.1 and 18.4 include quite a few typographical errors, particularly around bullet point format, which hinder interpretation.		
Chapter 18 – Water environment – Flood risk aspects				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**

EIA methodology	Volume 1, Chapter 18, Baseline	Local watercourses are described in “Surface water features”. Surface water flood risk should be considered additionally to both fluvial and reservoirs. This distinction is not clear in Section 18.6. Figure 18.1 demonstrates the water environment study area within the context of the assessment. Figures 18.2 and 18.3 demonstrate the distinction between main rivers and ordinary watercourses. A more detailed map would provide greater clarity. No mapping of surface water flood risk has been provided. Although this is listed in the Water environment data sources table (Table 18.4) and briefly discussed in Section 18.6.36. A more detailed assessment of surface water flood risk would be expected at a later stage.	There should be a clear distinction between fluvial flood risk (including main river or ordinary watercourse), surface water flood risk, reservoirs or canal (artificial) sources of flood risk.	Overall approach to flood risk aspects appears reasonable. HSPG would expect to see the clarifications listed here addressed in the future scoping report and PEIR.
	Volume 1, Chapter 18, Approach	The Flood Risk Assessment and EIA should adopt DMRB criteria (DMRB uses Very High as an additional level for designated/sensitive sites) and be NPPF compliant. The Flood Risk Assessment should demonstrate that there is no increase to flood risk as a result of the proposed development, to the Heathrow site or any of the satellite developments. Sewer flooding was not listed as a source of flooding in the scoping report; HSPG expect this flood source to be considered in the Flood Risk Assessment, as detailed in Table 18.11. Detailed modelling of the proposed culverting and diversion must be completed to demonstrate that any works to the watercourses will not have any adverse impacts on the watercourses or increase flood risk to the surrounding area. A more detailed map of the sections of the watercourse that will be modified should be provided in the Flood Risk Assessment.	The FRA and EIA should adopt DMRB significance criteria and be NPPF compliant. The risk of sewer flooding should be included in the assessment.	

	Volume 1, Chapter 18 Mitigation	A level for floodplain compensation should be provided for any lost flood storage and any loss of floodplain as a result of the development. The Scoping report provides no indication of the current preferred locations for floodplain compensation. Culverted river corridors are proposed to ensure connectivity remains across the proposed development. HSPG would expect to see hydraulic modelling to demonstrate that there are no adverse impacts to flood risk as a result of culverting the river corridor and combining the Colne and the Wraysbury watercourses. Demonstration that there would be no increase to food risk as a result of any new open channels would be expected as well as details of ownership and maintenance responsibilities.	All floodplain compensation areas should located away from any areas of development allocated in the local plan. HSPG would expect to receive more detail of the ownership and maintenance responsibilities of the floodplain compensation areas in the Flood Risk Assessment. Hydraulic modelling to demonstrate that there are no adverse impacts to flood risk as a result of culverting the river corridor or any new open channels should be undertaken	
	Volume 1, Chapter 18, Appendix 18.4 – Flood Risk Assessment	HSPG would expect to see mitigation and floodplain compensation included within the Flood Risk Assessment. A flood plan and access and operating arrangements in extreme flood events should be outlined in the Flood Risk Assessment. Justification for the sequential test and the exception test within the Flood Risk Assessment should be provided The level at which mitigation is required (as a result of modelling flood risk) should be discussed and agreed with the Environment Agency and HSPG.	Inclusion of a flood plan and access and operating arrangements should be included in the FRA. Justification for the sequential test and the exception test within the Flood Risk Assessment should be provided.	
Chapter 18 – Water environment – Water Framework Directive				
Aspect	**Volume/Report references**	**Questions and concerns**	**Proposed HSPG approach to address concerns**	**Summary**
EIA Methodology	Volume 1, Chapter 18 and Appendix 18.1, Table 18.1.1	Current status is not identified in the main report chapter, although the overall status is shown in the appendix. However, there is no acknowledgement for the Reasons for Not Attaining Good (RNAG) and therefore no understanding of the overall current pressures which give context to the proposed options when commenting.	Improve insight into the water environment.	Recommend inclusion of the RNAG and mitigation measures.
	Volume 1, Chapter 18, Table 18.14	Sensitivity Criteria: Does not conform with recognised methods, e.g. DMRB. See: http://www.standardsforhighways.co.uk/ha/standards/dmrb/v	-	Expand on the sensitivity criteria to include a category for “Very High” and add more clarity on

		ol11/section2/ha20508.pdf – Table 2.1 and https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/638648/TAG_unit_a3_envir_imp_app_dec_15.pdf - Table 14; Both of which included a "very High" classification for sensitivity and importance respectively. Sensitivity criteria is quite simplified and does not touch on specific sediment or morphological conditions, nor any supporting fluvial processes for habitats		observable conditions (specifically for hydromorphology) for the sediment regime, channel morphology and natural fluvial processes.
	Volume 1, Chapter 18, Table 18.15	Magnitude of Impact: as above, regarding guidance, typically terminology is *Neutral, Slight, Moderate, Large* and *Very Large* (Webtag) or *Major* to *Minor* (DMRB); does not differentiate between *Adverse* and *Beneficial*; does not account for potential for beneficial effects resulting from the proposed works; does not account for *No change* either.	-	Consider a change in terminology to be in line with recognised relevant standards, and include potential for beneficial effects.
	Volume 1, Chapter 18, and Appendix 18.1	Does not differentiate between *main river* and *ordinary watercourses*; The responsibility for ordinary watercourses lay with the LFA or IDB.	Opportunity to ensure the protection of the wider water environment, not only those designated under the WFD.	Identification of the entire potential impact on watercourses, both main and ordinary.
	Volume 3, Appendix 18.1	Lengths are based on 1:50k maps – this seems a little coarse given there are more accurate datasets available, e.g. OS Open Rivers 1:15-30k or Mastermap or the Digital River Networks (DRN)	Will also enable the smaller ordinary watercourses to be identified. Ensure thorough mitigation for all water bodies.	Better scale to encourage more accurate mapping and impacts assessment.
	Volume 1, Chapter 18, Table 18.1.5	Statement reads "An appropriate percentage and/or channel length" – what is the appropriate % or length?	Transparent screening criteria to be discussed upfront with EA and stakeholders to agree what constitutes low – high?	More specificity on the quantitative assessments.
Alternative options	HSPG slide deck 6th June issue, River Diversion Options and General Assembly Options 1 - 4	The descriptions on the potential GA options are not clear nor intuitive. The realignment locations and extent are not totally clear.	Opportunity to improve the general understanding of the potential options for the local community, helping engage and get better feedback in the long run.	More detailed layouts and labelled impacts required to thoroughly understand the potential impacts further.
Cumulative effects	Volume 3, Appendix 18.1	Limited acknowledgement of cumulative impacts in the Appendix document	-	Clearer scope on how the cumulative impacts will be assessed for the water environment. EIA methodology asks for two types of cumulative impacts: … from a single project; and …from different projects (in combination with the project being assessed) Not clear which is being recommended.
Scheme design	HSPG slide deck 6th June issue,	Too few details on the watercourse realignments and the proposed tunnel. Descriptions of the options are not intuitive	-	As above, more detailed focus on the scheme layouts for the

	River Diversion Options and General Assembly Options 1 - 4	and slightly confusing. There is little clarity on the design and mitigation for the tunnel environment.		realignments. Labelled and clearly shown on the plans.
MItigation	Volume 1, Chapter 18, and Volume 3, Appendix 18.1	Little detail on the potential mitigation proposed. Only the types of mitigation that will be considered.	Greater details on the tunnel and realignment mitigation.	Standard mitigation or best practice guidance should be outlined at the outset.

General – Cumulative effects		
Aspect	**Volume/Report references**	**Questions and concerns**
EIA methodology	Volume 1, Table 4.6	**Scope of Assessment table**: The table is inconsistent with methodology provided within Volume 1 and 3. All chapters should refer to assessment of cumulative effects and In-combination effects within the Scope of Assessment as well as for both construction and operational phases.
	Volume 1, Section 4.6.6	PINS guidance suggests that exclusion/ inclusion criteria should be applied to stage 2 and not stage 1 as is set out here.
	Volume 1, Section 4.6.6	The methodology states that for Tier 1 developments a five-year exclusion criterion is in place. Some very large developments may have complex planning permissions with ongoing issues and may have temporal overlap despite their original planning permissions being approved outside of this 5-year timeframe. Justification for exclusion or confirmation of inclusion should be provided.
	Volume 1, Section 4.6.6	The Scoping Report suggest that Tier 3 developments have insufficient information to undertake Cumulative Effects Assessment. PINS advice note 17 recognises this may be a limitation and has the following recommendation *3.4.2 The assessment should be undertaken to an appropriate level of detail, commensurate with the information available at the time of assessment. Information on some proposals may be limited and such gaps should be acknowledged within the assessment, moving from a more quantitative to a more qualitative assessment as the availability and/or certainty of information decreases. The uncertainty in such assessments should be clearly documented.* Despite limited information, it is likely that high-level qualitative assessment could still be undertaken for the majority of sites with spatial and temporal information. In particular identification any conflicting proposed land uses or potential effects on sensitive receptors within the vicinity of both developments.
	Volume 1, Section 4.6.7	It is proposed that the development schedule be frozen six months ahead of each phase of the assessment. If major DCO or EIA projects are anticipated to or do come forward in this intervening time they should be considered at each stage. The development schedule should be as up-to-date as possible at each phase; though some time lapse will be necessary, it should be minimised. This would also reduce the likelihood of being asked for further detail and assessment during the examination stage [as noted in PINS advice note 17 para.3.4.9]. This also applies to Volume 3 para. 3.4.1.

	Volume 1, Section 4.7.3	Clarification is required on identification of receptors. Will this involve all receptors within the ZoI being considered or is there an alternative spatial scale. Assets that fall outside of community areas should also be considered e.g. sensitive areas including SSSI or regional parks in the vicinity of the scheme that may be used by wider communities or be of national & regional significance. How are receptors identified? And to what spatial extent?
	Volume 3, Appendices Table 2.1	**Stage 1** - The ZoI appears to be limited, and it is considered that very large developments or specific types of development e.g. transport-related are likely to both impact on and be impacted by Heathrow expansion. These should be considered for inclusion despite lying outside the ZoI e.g. any DCO within the Transport Modelling area may be more appropriate.
	Volume 3, Appendices Section 3.2.7	5-year limit for inclusion in the development schedule may result in very large or complex developments being missed out of the assessment. It is recommended that the assessment include all extant permissions.
	Volume 3, Appendices Section 3.2.8	Para. 3.2.8 states that NSIPs within 10km of the scheme will be considered. This appears to contradict para. 3.2.9 which says that Tier 2 (NSIPs with Scoping Opinions) will be considered within ZoI.
	Volume 3, Appendices Section 3.2.13	Where information on type of development, and spatial and temporal data is available it is thought that a high level cumulative effects assessment is possible. Although it is agreed that individual receptors and/or environmental topics may not be assessable, a high-level assumption-based summary on main issues is likely to be achievable for many sites allocated in local plans or similar.
	Volume 3, Appendices Section 3.2.15	Whilst all developments of a certain size and threshold are required to undertake EIA this does not mean that all effects will be mitigated by either Heathrow Expansion Project or the 'other development'. Some losses are irreversible (e.g. ancient woodland) and should not be considered by a piecemeal approach but rather through a '*holistic mitigation strategy*' [PINS advice note 17; para. 3.4.12]. It is not suitable to leave it to 'other developments' to provide mitigation if there is likely to be a significant cumulative effect in the future. Due to the long time scales with this project, temporal overlap of site allocations in local plans is possible, even where these have not yet submitted planning applications.
	Volume 3, Appendices Section 3.4.1	See comment above on development schedule freeze period.
	Volume 3, Appendices, Table 3.1.1	The ZOI table should clearly set out distances or method of what constitutes 'area over which effects'. The latter suggests professional judgment has been exercised, but does not provide any further detail or justification for these spatial areas. For transparency the justification for the ZoI should be summarised here.

Ministry of Defence

Defence Infrastructure Organisation

Sir/Madam
3D Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN

Safeguarding Department
Statutory & Offshore

Defence Infrastructure Organisation
Kingston Road
Sutton Coldfield
West Midlands
B75 7RL

Tel: +44 (0)121 311 2443 **Tel (MOD):** 94421 2443
Fax: +44 (0)121 311 2218
E-mail: DIO-safeguarding-statutory@mod.gov.uk

www.mod.uk/DIO

18 June 2018

Your Reference: TR020003
Our reference: 10042740 - rev 1

Dear Sir/Madam,

MOD Safeguarding – RAF Northolt

Proposal: **Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11 – Application by Heathrow Airport Limited (the applicant) for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the Proposed Development) – Scoping consultation**

Location: **Heathrow Airport**

Thank you for consulting the Ministry of Defence (MOD) on the above Scoping consultation. The MOD has been asked to provide comments on what the applicant should consider when preparing their Environmental Statement.

Heathrow Airport occupies statutory safeguarding zones surrounding RAF Northolt in Ruislip. The airport is approximately 9.4km to the south of RAF Northolt and occupies aerodrome height and birdstrike safeguarding zones.

The EIA Scoping Report refers to the effects the airport expansion could have on surrounding surface and groundwater features. To mitigate flood risks new flood storage areas will be created which will also provide opportunities for creating new wetland habitats. Within the birdstrike safeguarding zone the MOD would have concerns with the creation of any habitats which have the potential to attract birds hazardous to air traffic.

The creation of any new water bodies to provide additional flood storage capacity particularly to the north of Heathrow Airport would be of concern to the MOD. The Environmental Impact Assessment and subsequent submissions prepared for this scheme should therefore consider birdstrike safeguarding when creating new wetland habitats and these should be designed to minimise their attractiveness to species of birds hazardous to air traffic.

Provided the design of any new flood storage areas and associated wetland habitats are designed to minimise their attractiveness to species of birds hazardous to air traffic and the aerodrome height safeguarding zones are not infringed by any structures then it is most likely that the MoD would not formally object to the scheme proposed.

I trust this is clear however should you have any questions please do not hesitate to contact me.

Yours sincerely



Laura Nokes
Safeguarding Officer

National Grid house
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

Land and Acquisitions
Spencer Jefferies
Development Liaison Officer
Network management
Spencer.Jefferies@nationalgrid.com
Direct tel: +44 (0)7812 651481

www.nationalgrid.com

SUBMITTED ELECTRONICALLY:
HeathrowAirport@pins.gsi.gov.uk

19 June 2018

Dear Sir/Madam

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11

Application by Heathrow Airport Limited (the Applicant) for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the Proposed Development)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if requested

This is a response on behalf of National Grid Electricity Transmission PLC (NGET).

I refer to your letter dated 22nd May 2018 regarding the proposed Order. NGET wish to express their interest in further consultation while the impact on our assets is still being assessed.

Can a representative of yours please contact me using the details above at the earliest convenience in regards to this proposed development.

In respect of existing NGET infrastructure, NGET will require appropriate protection for retained apparatus including compliance with relevant standards for works proposed within close proximity of its apparatus; providing that the order affects NGET apparatus in any way.

NGET assets near the proposed Order:

EALING - LALEHAM 2: 275kV Cable
IVER-NORTH HYDE: 275kV Cable

VW ROUTE: 275kV Over Head Line

Please see relevant guidance for working near NGET assets below.

National Grid is a trading name for:
National Grid Electricity Transmission plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2366977

National Grid is a trading name for:
National Grid Gas plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2006000

National Grid house
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

Where the Promoter intends to acquire land, extinguish rights, or interfere with any of NGET's apparatus, both will require appropriate protection and further discussion on the impact to its apparatus and rights.

Specific Comments – Electricity Infrastructure:

- National Grid's Overhead Line/s is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset

- Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. National Grid recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for "overhead line clearances Issue 3 (2004).

- If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances.

- The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's (www.hse.gov.uk) Guidance Note GS 6 "Avoidance of Danger from Overhead Electric Lines" and all relevant site staff should make sure that they are both aware of and understand this guidance.

- Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum "sag" and "swing" and overhead line profile (maximum "sag" and "swing") drawings should be obtained using the contact details above.

- If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances.

- Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or "pillars of support" of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation ("pillar of support") drawings can be obtained using the contact details above.

- National Grid Electricity Transmission high voltage underground cables are protected by a Deed of Grant; Easement; Wayleave Agreement or the provisions of the New Roads and Street Works Act. These provisions provide National Grid full right of access to retain, maintain, repair and inspect our assets. Hence we require that no permanent / temporary structures are to be built over our cables or within the easement strip. Any such proposals should be discussed and agreed with National Grid prior to any works taking place.

- Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the

National Grid house
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented.

Technical information and guidance documents mentioned above in regards to National Grid's apparatus can be found at:

https://www.nationalgrid.com/uk/about-grid/our-networks-and-assets/land-planning-and-development

I hope the above information is useful. If you require any further information please do not hesitate to contact me.

Yours sincerely

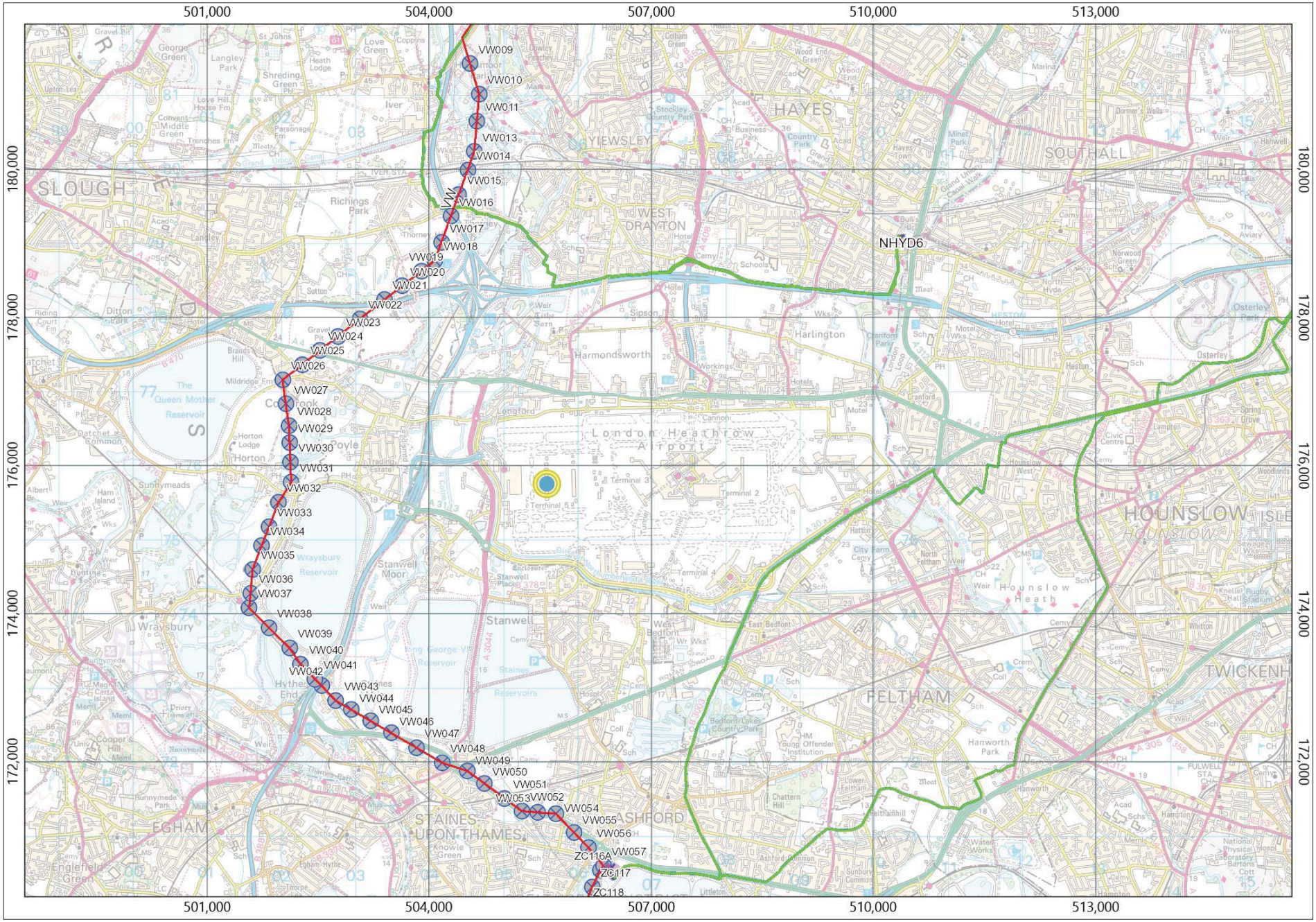
[redacted]

Spencer Jefferies
Development Liaison Officer, Land and Acquisitions.

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National Grid Electricity Transmission plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2366977

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National Grid Gas plc
Registered Office: 1-3 Strand, London WC2N 5EH
Registered in England and Wales, No 2006000

nationalgrid | Heathrow





Legend:

- Substations Commissioned
- OHL 400Kv Commissioned
- OHL 275Kv Commissioned
- OHL 132Kv & Below Commissioned
- Towers Commissioned
- Buried Cable Commissioned
- Fibre Cable Commissioned
- Pilot Cable
- Gas Operational Boundary
- Gas Site Boundary
- Block Valve
- Compressor
- LNG Site
- Multijunction
- Minimum Offtake
- Future Minimum Offtake
- Offtake
- Pressure Reduction Installation
- Pig Trap
- Terminal
- Transferred Offtake
- Aerial Marker Post
- CP Test Post
- Transformer Rectifier
- Gas Pipe Feeder
  - Commissioned
  - Decommissioned Group
  - Planned and Spares
- Pipe Line Control Point

Notes:

Third Runway

0 1.27 2.5 Kilometers

OS Disclaimer: Background Mapping information has been reproduced from the Ordnance Survey map by permission of Ordnance Survey on behalf of The controller of Her Majesty's Stationery Office. ©Crown Copyright Ordnance Survey NationalGrid Electricity-100024241.NationalGrid Gas-100024886

Date: 19/06/2018
Time: 16:28:55

Page size: A3 Landscape Scale: 1: 50,000
Print by: **Jefferies, Spencer**

NG Disclaimer: National Grid UK Transmission. The asset position information represented on this map is the intellectual property of National Grid PLC (Warwick Technology Park, Warwick, CV346DA) and should not be used without prior authority of National Grid.

Note: Any sketches on the map are approximate and not captured to any particular level of precision.

NATS Safeguarding Office
4000 Parkway
Whiteley
Fareham
PO15 7FL

T: 01489 444687
E: natssafeguarding@nats.co.uk

The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol
BS1 6PN

11th June 2018

Sent via email: HeathrowAirport@pins.gsi.gov.uk

Dear Sir/Madam,

Application by Heathrow Airport Limited (the Applicant) for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway)

I refer to the application above by Heathrow Airport Limited (HAL) and can confirm that a third runway at Heathrow will have a major impact upon NATS En-route's (NERL) operations and infrastructure.

For this reason NERL is collaborating with HAL at various corporate and technical levels in respect of the third runway, not only in relation to the infrastructure and procedures required to ensure that the eventual three runway operation integrates with the wider air traffic environment but also that during the development phase the existing two runway airport continues to operate safely and efficiently.

NERL is satisfied that there is a very good working relationship with HAL and that through the joint NERL-HAL collaboration it will be able to address any concerns it might have, however NERL is happy to keep the Government informed in respect to its position and the progress of any on-going work.

Kind regards

[redacted]

Alasdair Auld
On Behalf of NATS Safeguarding

Date: 19 June 2018
Our ref: 249432
Your ref: TR020003

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

T 0300 060 3900

BY EMAIL ONLY
HeathrowAirport@pins.gsi.gov.uk

Dear Sir/Madam

Environmental Impact Assessment Scoping consultation (Regulation 15 (3) (i) of the EIA Regulations 2011): Expansion of Heathrow Airport and creation of third runway.
Location: Heathrow Airport

Thank you for seeking our advice on the scope of the Environmental Impact Assessment/Environment Statement (EIA/ES) in your consultation which we received on 23 May 2018.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Case law[1] and guidance[2] has stressed the need for a full set of environmental information to be available for consideration prior to a decision being taken on whether or not to grant planning permission. Annex A to this letter provides Natural England's advice on the scope of the Environmental Impact Assessment (EIA) for this development.

Should the proposal be amended in a way which significantly affects its impact on the natural environment then, in accordance with Section 4 of the Natural Environment and Rural Communities Act 2006, Natural England should be consulted again.

We would be happy to comment further should the need arise but if in the meantime you have any queries please do not hesitate to contact us. For any queries relating to the specific advice in this letter only please contact Jonathan Shavelar at jonathan.shavelar@naturalengland.org.uk.

For any new consultations, or to provide further information on this consultation please send your correspondences to consultations@naturalengland.org.uk.

Yours faithfully

Jonathan Shavelar
Thames Team

[1] Harrison, J in *R. v. Cornwall County Council ex parte Hardy* (2001)
[2] *Note on Environmental Impact Assessment Directive for Local Planning* Authorities Office of the Deputy Prime Minister (April 2004) available from http://webarchive.nationalarchives.gov.uk/+/http://www.communities.gov.uk/planningandbuilding/planning/sustainabilityenvironmental/environmentalimpactassessment/noteenvironmental/

Annex A – Advice related to EIA Scoping Requirements

1. General Principles

Schedule 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2011, sets out the necessary information to assess impacts on the natural environment to be included in an ES, specifically:

- A description of the development – including physical characteristics and the full land use requirements of the site during construction and operational phases.
- Expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.
- An assessment of alternatives and clear reasoning as to why the preferred option has been chosen.
- A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.
- A description of the likely significant effects of the development on the environment – this should cover direct effects but also any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects. Effects should relate to the existence of the development, the use of natural resources and the emissions from pollutants. This should also include a description of the forecasting methods to predict the likely effects on the environment.
- A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.
- A non-technical summary of the information.
- An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

It will be important for any assessment to consider the potential cumulative effects of this proposal, including all supporting infrastructure, with other similar proposals and a thorough assessment of the 'in combination' effects of the proposed development with any existing developments and current applications. A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.
Natural England are broadly satisfied with the general principles throughout the ES, but do raise specific matters below.

2. Biodiversity and Geology

2.1 Ecological Aspects of an Environmental Statement

Natural England advises that the potential impact of the proposal upon features of nature conservation interest and opportunities for habitat creation/enhancement should be included within this assessment in accordance with appropriate guidance on such matters. It is acknowledged that these opportunities are not yet fully developed due to the scale of the development. Guidelines for Ecological Impact Assessment (EcIA) have been developed by the Chartered Institute of Ecology and Environmental Management (CIEEM) and are available on their website.

The National Planning Policy Framework sets out guidance in S.118 on how to take account of biodiversity interests in planning decisions and the framework that local authorities should provide to assist developers.

2.2 Internationally and Nationally Designated Sites

The ES should thoroughly assess the potential for the proposal to affect designated sites. Natural England note that for designated sites close to the development, potential impacts have been sufficiently scoped in. There is however the possibility that sites outside the study areas may be affected by air quality impacts resulting from increased vehicle movements. The scoping document does not provide full clarity about the assessment methodology for air quality effects. For example, it

is not clear if biodiversity effects of air quality will extend outside of the biodiversity study area (Figure 6.1), the air quality study area (Figure 5.1) or the traffic modelling area (Figure 17.1). Natural England note that “the study area may evolve as appropriate” and would encourage the inclusion of specific information about the assessment of air quality impacts on nationally and internationally designated sites. European sites (e.g. designated Special Areas of Conservation and Special Protection Areas) fall within the scope of the Conservation of Habitats and Species Regulations 2017. In addition paragraph 118 of the National Planning Policy Framework requires that potential Special Protection Areas, possible Special Areas of Conservation, listed or proposed Ramsar sites, and any site identified as being necessary to compensate for adverse impacts on classified, potential or possible SPAs, SACs and Ramsar sites be treated in the same way as classified sites.

Under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 an appropriate assessment needs to be undertaken in respect of any plan or project which is (a) likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and (b) not directly connected with or necessary to the management of the site.

It has been identified that there is the potential for Likely Significant Effect on a European/Internationally designated site. As a result the competent authority will need to prepare an Appropriate Assessment, in addition to consideration of impacts through the EIA process.

Figure 6.3 shows the results of Phase 1 habitat surveys. Natural England note that the information could be presented in a more ‘user-friendly’ way, as it is currently difficult to read and identify the keys. For example, many of the letters used to indicate features become broken up by features on the map. This should be addressed in the EIA/ES.

Sites of Special Scientific Interest (SSSIs) and sites of European or international importance (Special Areas of Conservation, Special Protection Areas and Ramsar sites)
For reference, further information on SSSIs and their special interest features can be found at www.magic.gov. The Environmental Statement should include a full assessment of the direct and indirect effects of the development on features of special interest and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects. Natura 2000 network site conservation objectives are available on our website; http://publications.naturalengland.org.uk/category/6490068894089216

The EIA scoping document does not specifically refer to Special Protection Area Functionally Linked Habitat. Special Protection Areas (SPAs) are classified for rare and vulnerable birds, and for regularly occurring migratory species. Annex 1 bird species associated with the SPA receive protection both within and outside of the SPA boundary. Sites outside of the SPA which support the Annex 1 bird species, often referred to as SPA supporting habitat or ‘functionally linked’ habitat, play an important role in maintaining the SPA bird population through the provision of additional roosting or feeding areas. Due to the importance of these off-site habitats in maintaining Annex 1 bird populations, the supporting habitat benefits from the same level of protection as the SPA itself. Therefore, any impact to, or loss of, SPA functionally linked habitat would need to be adequately mitigated against or compensated for. The Wintering Bird Survey Methodology shows that relevant areas will be surveyed for relevant Annex 1 bird species. Natural England would advise that full consideration should be given to the assessment of Functionally Linked Habitat.

2.3 Regionally and Locally Important Sites
The EIA will need to consider any impacts upon local wildlife and geological sites. Local Sites are identified by the local wildlife trust, geoconservation group or a local forum established for the purposes of identifying and selecting local sites. They are of county importance for wildlife or geodiversity. The Environmental Statement should therefore include an assessment of the likely impacts on the wildlife and geodiversity interests of such sites. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures. Contact the local wildlife trust, geoconservation group or local sites body in this area for further information.

2.4 Protected Species - Species protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2017
The ES should assess the impact of all phases of the proposal on protected species (including, for example, great crested newts, reptiles, birds, water voles, badgers and bats). Natural England does not hold comprehensive information regarding the locations of species protected by law, but advises on the procedures and legislation relevant to such species. Records of protected species should be sought from appropriate local biological record centres, nature conservation organisations, groups and individuals; and consideration should be given to the wider context of the site for example in terms of habitat linkages and protected species populations in the wider area, to assist in the impact assessment.

The conservation of species protected by law is explained in Part IV and Annex A of Government Circular 06/2005 *Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System*. The area likely to be affected by the proposal should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES.

In order to provide this information there may be a requirement for a survey at a particular time of year. Surveys should always be carried out in optimal survey time periods and to current guidance by suitably qualified and where necessary, licensed, consultants. Natural England has adopted standing advice for protected species which includes links to guidance on survey and mitigation.

2.5 Habitats and Species of Principal Importance
The ES should thoroughly assess the impact of the proposals on habitats and/or species listed as 'Habitats and Species of Principal Importance' within the England Biodiversity List, published under the requirements of S41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act 2006 places a general duty on all public authorities, including local planning authorities, to conserve and enhance biodiversity. Further information on this duty is available here.

Government Circular 06/2005 states that Biodiversity Action Plan (BAP) species and habitats, 'are capable of being a material consideration…in the making of planning decisions'. Natural England therefore advises that survey, impact assessment and mitigation proposals for Habitats and Species of Principal Importance should be included in the ES. Consideration should also be given to those species and habitats included in the relevant Local BAP.

Natural England advises that a habitat survey (equivalent to Phase 2) is carried out, in order to identify any important habitats present. In addition, ornithological, botanical and invertebrate surveys should be carried out at appropriate times in the year, to establish whether any scarce or priority species are present. The Environmental Statement should include details of:

- Any historical data for the site affected by the proposal (e.g. from previous surveys);
- Additional surveys carried out as part of this proposal;
- The habitats and species present;
- The status of these habitats and species (e.g. whether priority species or habitat);
- The direct and indirect effects of the development upon those habitats and species;
- Full details of any mitigation or compensation that might be required.
- We note in paragraph 6.5.3. that the full area will be defined at a later stage.

The development should seek if possible to avoid adverse impact on sensitive areas for wildlife within the site, and we welcome the commitment to provide a biodiversity net-gain.

The current study area looks comprehensive but Natural England would advise it is likely that there are sites outside of the current survey extent which may require baseline survey effort if the development seeks to use these areas to provide mitigation, net gain or compensation. These will need to be included as and when they are identified.

The record centre for the relevant Local Authorities should be able to provide the relevant information on the location and type of priority habitat for the area under consideration.

2.6 Contacts for Local Records
Natural England does not hold local information on local sites, local landscape character and local or national biodiversity priority habitats and species. We recommend that you seek further information from the appropriate bodies (which may include the local records centre, the local wildlife trust, local geoconservation group or other recording society and a local landscape characterisation document).

Natural England note that there have been delays in obtaining some local data sets and would highlight that these will need to be presented as part of the ES.

3. Access and Recreation
Natural England encourages any proposal to incorporate measures to help encourage people to access the countryside for enjoyment. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways are to be encouraged. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of wider green infrastructure. Relevant aspects of local authority green infrastructure strategies should be incorporated where appropriate.

Rights of Way, Access land, and National Trails
The EIA should consider potential impacts on access land, public open land, rights of way and coastal access routes in the vicinity of the development. Consideration should also be given to the potential impacts on nearby trails. The National Trails website www.nationaltrail.co.uk provides information including contact details for the National Trail Officer. Appropriate mitigation measures should be incorporated for any adverse impacts. We also recommend reference to the relevant Right of Way Improvement Plans (ROWIP) to identify public rights of way within or adjacent to the proposed site that should be maintained or enhanced.

The Colne Valley Trail is set to be directly impacted by the footprint of the third runway. This will have major consequences for the north/south connectivity within the Regional Park and the EIA needs to consider how the design of the development will ensure this connectivity is maintained.

Green Infrastructure
Greening our towns and cities, and helping people improve their health and wellbeing by using green spaces are both key principles within the Government's 25 Year Environment Plan. Extensive and well-designed Green Infrastructure can deliver and reinforce wider community and environmental benefits, which directly deliver the Government's ambitions as set out in the plan.

Natural England welcome the plan to include an Open Space Assessment to inform the design of the green infrastructure plan. Effective green infrastructure should be utilised to increase the permeability of the local landscape for both biodiversity and people.

4. Protected Landscapes
The construction of the airport will have an impact on local landscape but not on any nationally designated landscapes, whilst the operational element of the proposed development has the potential to impact nationally designated landscapes, such as the Chilterns Area of Outstanding Natural Beauty.

Natural England supports the use of the relevant National Character Areas for the broader landscape as well as more local landscape character assessments and other resources at local authority level where these are available. We encourage the use of Landscape Character Assessment (LCA), based on the good practice guidelines produced jointly by the Landscape Institute and Institute of Environmental Assessment in 2013. LCA provides a sound basis for guiding, informing and understanding the ability of any location to accommodate change and to make positive proposals for conserving, enhancing or regenerating character, as detailed proposals are developed. Where local areas are designated primarily for biodiversity or heritage they should

be included within the landscape and visual impact assessment if they are accessible to the public. We would recommend the inclusion of the London Environment Strategy as a resource (table 13.3).

Natural England supports the publication *Guidelines for Landscape and Visual Impact Assessment*, produced by the Landscape Institute and the Institute of Environmental Assessment and Management in 2013 (3rd edition). We support the intention to use this methodology which is almost universally used for landscape and visual impact assessment. Using a nominal ZTV of 5km is appropriate to the scale of the project and the topography of the surrounding area.

Natural England are satisfied that both construction and operational effects are being considered. We note that the LVIA is anticipated to respond to any changes in project parameters and input from stakeholders where relevant and we continue to work with stakeholders to identify further areas to be included in the LVIA.

The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. In this context Natural England advises that the cumulative impact assessment should include other proposals currently at Scoping stage. Due to the overlapping timescale of their progress through the planning system, cumulative impact of the proposed development with those proposals currently at Scoping stage would be likely to be a material consideration at the time of determination of the planning application.

When considering an assessment of Airspace impacts on the landscape in due course, which is likely to include a wider area, consideration should be given to cumulative impacts in protected landscapes for example the route of HS2 within the Chilterns AONB.

We also advise that you consult the relevant AONB Partnership or Conservation Board. Their knowledge of the site and its wider landscape setting, together with the aims and objectives of the AONB's statutory management plan, will be a valuable contribution to the planning decision.

5. Soil and Agricultural Land Quality

Impacts from the development should be considered in light of the Government's policy for the protection of the best and most versatile (BMV) agricultural land as set out in paragraph 112 of the NPPF. We also recommend that soils should be considered under a more general heading of sustainable use of land and the ecosystem services they provide as a natural resource in line with paragraph 109 of the NPPF.

Soil is a finite resource that fulfils many important functions and services (ecosystem services) for society, for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution. It is therefore important that the soil resources are protected and used sustainably.

The applicant should consider the following issues as part of the Environmental Statement:

1. The degree to which soils are going to be disturbed/harmed as part of this development and whether 'best and most versatile' agricultural land is involved. This may require a detailed survey if one is not already available. For further information on the availability of existing agricultural land classification (ALC) information see www.magic.gov.uk. Natural England Technical Information Note 049 - *Agricultural Land Classification: protecting the best and most versatile agricultural land* also contains useful background information.

2. If required, an agricultural land classification and soil survey of the land should be undertaken. This should normally be at a detailed level, eg one auger boring per hectare, (or more detailed for a small site) supported by pits dug in each main soil type to confirm the physical characteristics of the full depth of the soil resource, ie 1.2 metres.

3. The Environmental Statement should provided details of how any adverse impacts on soils can be minimised. Further guidance is contained in the *Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites*.

6. Air Quality

Air quality in the UK has improved over recent decades but air pollution remains a significant issue; for example over 97% of sensitive habitat area in England is predicted to exceed the critical loads for ecosystem protection from atmospheric nitrogen deposition (England Biodiversity Strategy, Defra 2011). A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity.

Table 3.6 shows that air quality effects on rivers and flood storage are not considered as part of the ES. Natural England would recommend screening air quality impacts to rivers and flood storage in to the ES. The plans at this stage are not sufficiently developed to screen this impact out. Future plans could include areas of stagnant or low flowing water which may be susceptible to impacts from air quality. There are numerous options being looked at for the road configurations, many of which will bring the potential air quality impacts close to water courses. Some water courses may flow into designated sites. Green infrastructure and mitigation plans may also feature wetland areas which could be impacted by air quality.

Table 3.7 shows relevant environmental topics to airport supporting facilities. Natural England would suggest that the rationale for scoping out car parking, along with other polluting elements of the proposals such as energy generation plant, has not been clearly set out. We highlight the need to justify this, otherwise we recommend these elements are scoped into the assessment.

Table 4.6 sets out the scope of the ES. It is notable that the emissions from aircraft operation are screened in only for their impacts to human health, not biodiversity. Natural England suggest that potential air quality impacts from aircraft fuel combustion are screened in at this stage, as this will allow for the assessment of relevant modelling documents.

Traffic increases on the road network potentially impacting nationally designated sites need to be specifically considered. Please see comments in Section 2.2.

Graphic 4.1 sets out the approach to in-combination assessment and paragraph 4.7.7 stipulates this approach will be used for aspects of the development which may impact ecology. 5.9.34 states cumulative effects of air quality will follow the approach in 4.6, although it is not clear if this is just for impacts on human health or if it also includes biodiversity. Natural England would suggest a specific approach is outlined regarding the method for in-combination assessment of biodiversity impacts from air quality.

Projects and plans that increase road traffic flow have a high likelihood of acting together, or in-combination, with other plans or projects that would also increase traffic on the same roads. Vehicles generated by different plans or projects can end up on the exact same road(s) (forming a line source of emissions) within or close to the same site. In these cases, it is difficult to justify use of a threshold alone for determining likelihood for significant effect by applying it solely to the project being assessed. The threshold should be applied in-combination.

An in-combination effect is one which does not represent a likely significant effect ‘alone’ but, when added to similar effects from other live plans and projects, becomes significant.

The Wealden Judgment 2017 found that the use of the 1000 Annual Average Daily Traffic (AADT) guideline (a proxy for 1% (on road) of the critical level/load for the receiving habitat) as the sole means of catering for in-combination effects lacked coherence, particularly where other figures are known which, when added together, would cause that threshold to be exceeded. From that, the Court concluded that where the likely effect of an individual plan or project does not itself exceed the threshold of 1000 AADT (or 1%), its effect must still be considered alongside the similar effects of other ‘live’ plans and projects to check whether their added or combined effect on a site could be significant.

Natural England recognises that at both the screening and appropriate assessment stages of a HRA, the likely effects of a plan or project need to be thought about individually and in combination

with other relevant plans or projects. This is a legal requirement of the Habitats Regulations and it helps to ensure that European sites are not inadvertently damaged by the additive effects of multiple plans or projects.

Further information on air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (www.apis.ac.uk). Further information on air pollution modelling and assessment can be found on the Environment Agency website.

7. Climate Change Adaptation

The England Biodiversity Strategy published by Defra establishes principles for the consideration of biodiversity and the effects of climate change. The ES should reflect these principles and identify how the development's effects on the natural environment will be influenced by climate change, and how ecological networks will be maintained. The NPPF requires that the planning system should contribute to the enhancement of the natural environment 'by establishing coherent ecological networks that are more resilient to current and future pressures' (NPPF Para 109), which should be demonstrated through the ES.

8. Cumulative and in-combination effects

A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.

The ES should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out. The following types of projects should be included in such an assessment, (subject to available information):

a. existing completed projects;
b. approved but uncompleted projects;
c. ongoing activities;
d. plans or projects for which an application has been made and which are under consideration by the consenting authorities; and
e. plans and projects which are reasonably foreseeable, ie projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects.

From: Morgan Barbara
To: Expansion of Heathrow Airport (Third Runway)
Subject: FW: Ref: TR020003 Expansion of Heathrow Airport (Third Runway)
Date: 18 June 2018 09:07:08

Network Rail
1st Floor
Bristol Temple Point
Bristol
BS1 6NL

Ask for : Barbara Morgan
Tel : 0117 3721125

My Ref : P/TP18/0397/BM
Your Ref : TR020003

Date : 18 June 2018

Dear Sir/Madam

Planning Act 2008 (as amended) and The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) – Regulations 10 and 11

Application by Heathrow Airport Limited (the Applicant) for an Order granting Development Consent for the Expansion of Heathrow Airport (Third Runway) (the Proposed Development)

Scoping consultation and notification of the Applicant's contact details and duty to make available information to the Applicant if required>

Western Rail Link to Heathrow (WRLtH) is a Nationally Significant Infrastructure Project and requires the submission of a Development Consent Order (DCO). Statutory consultation is taking place in May/June 2018 with an anticipated DCO submission date of mid-2019. The material within the Heathrow Expansion Scoping Report suggests that there may be design conflicts with WRLtH Shafts 2, 3 and 4 (surface portals to tunnels). It is essential that Heathrow works with Network Rail's project team to provide assurance on compatibility of design. Incompatibility could mean that the WRLtH alignment needs to be reviewed, which would have significant programme, cost, and delivery implications.

Our comments as set out below relate to the Scoping Report and those aspects where we believe there is an interface with the proposed WRLtH scheme. For clarity I have set out our response into the following sections:

- Cumulative development;
- Optioneering and design development; and
- Further information

Cumulative development

The methodology for cumulative effects assessment is set out in Chapter 4 and Appendix 4.2 of the Scoping Report. Within these documents the WRLtH project has been categorised as a Tier 2 scheme for the cumulative effects assessment with the proposed Heathrow Expansion. However, Table 3.4.4 of Appendix 3.4 contains outdated information from the Planning Inspectorate's website quoting the planned submission of the WRLtH Development Consent Order (DCO) application as "submission expected: Q4 2017".
For clarity the proposed dates Network Rail are working to are as follows:

- DCO application submission mid 2019;
- Construction commencing end 2020 for environmental works and 2022 for main construction works; and
- Construction works complete by end of 2027, a period of testing and commissioning would follow in 2028 (year of opening).

On the basis of the proposed dates associated with the DCO process for Heathrow Airport as set out in the Scoping Report, we are in agreement that the WRLtH should be considered a Tier 2 development for the Preliminary Environmental Impact Report (PEIR). We would note that for the Environmental Statement (ES), WRLtH should be considered as a Tier 1 development as our DCO application is proposed to submitted prior to the submission of the Heathrow Expansion DCO application.

Optioneering and design development

Chapter 3 'The DCO Project' of the Scoping Report sets out the principal components of the scheme and where there are a number of options for some of the elements (including but not limited to: runways and taxiways, terminals and aprons and M25 motorway and other road diversions). The proposals are also set out within Figures 3.1 – 3.15. Network Rail have identified a number of potential conflicts with the design for the WRLtH at Shafts 2, 3 and 4 and also note that some of this development including the proposed expanded airfield would be directly above the proposed WRLtH twin-bored tunnel.

Network Rail would request that Heathrow consider the options with the least impact on the WRLtH proposals and work with Network Rail's project team to provide assurance on compatibility of design. The load bearing capacity of the tunnel will need to be considered for any development that is proposed to be on top of the proposed alignment.

The proposed construction site plans for Heathrow Expansion are set out within Figure 3.17. Network Rail has again noted potential conflict with these locations and would request that a similar approach as set out above be considered to ensure that both schemes are compatible during both construction and operation.

Further Information

If you would like any further information or clarification on any point then please do not hesitate to contact michaela.payne@networkrail.co.uk.

Yours sincerely,

Barbara Morgan
Town Planning Technician (Western & Wales)

www.networkrail.co.uk/property

Please send all Notifications and Consultations to townplanningwestern@networkrail.co.uk or by post to Network Rail, Town Planning, 1st Floor, Bristol Temple Point, Redcliffe Way, Bristol BS1 6NL

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CRCE/NSIP Consultations
Chilton
Didcot
Oxfordshire OX11 0RQ

T +44 (0) 1235 825278
F +44 (0) 1235 822614

www.gov.uk/phe

The Planning Inspectorate
3D Eagle Wing
Temple Quay House
2 The Square
Bristol, BS1 6PN

Your Ref : TR020003

Our Ref : 43907

19 June 2018

Dear Sir/Madam,

Re: Scoping Consultation
Application for an Order Granting Development Consent for the proposed Expansion of Heathrow Airport (Third Runway)

Thank you for including Public Health England (PHE) in the scoping consultation phase of the above application. Advice offered by PHE is impartial and independent.

PHE exists to protect and improve the nation's health and wellbeing, and reduce health inequalities; these two organisational aims are reflected in the way we review and respond to Nationally Significant Infrastructure Project (NSIP) applications.
The health of an individual or a population is the result of a complex interaction of a wide range of different determinants of health, from an individual's genetic make-up, to lifestyles and behaviours, and the communities, local economy, built and natural environments to global ecosystem trends. All developments will have some effect on the determinants of health, which in turn will influence the health and wellbeing of the general population, vulnerable groups and individual people. Although assessing impacts on health beyond direct effects from, for example, emissions to air or road traffic incidents is complex, there is a need to ensure a proportionate assessment focused on an application's significant effects.

This project sits within the remit of the draft Airports National Policy Statement (NPS), which specifically refers to the need to assess the likely significant effects of the project on health in Section 4 (paragraphs 4.66–4.69). The NPS indicates that airport infrastructure development proposals can have both beneficial and adverse impacts on health (para 4.66) and that the scale of development may have indirect impacts on health through a range of determinants (para 4.67). It also notes that more than one development may affect people simultaneously; as such, cumulative impacts on health should be given due consideration (para 4.69).

Environmental Public Health

We understand that the promoter will wish to avoid unnecessary duplication and that many issues including noise, air quality, emissions to water, waste, contaminated land etc. will be covered elsewhere in the Environmental Statement (ES). We

believe the summation of relevant issues into a specific section of the report provides a focus which ensures that public health is given adequate consideration and potentially cumulative effects are properly considered. The section should summarise key information, risk assessments, proposed mitigation measures, conclusions and residual impacts, relating to human health. Compliance with the requirements of National Policy Statements and relevant guidance and standards should also be highlighted.

In terms of the level of detail to be included in an ES, we recognise that the differing nature of projects is such that their impacts will vary. Any assessments undertaken to inform the ES should be proportionate to the potential impacts of the proposal, therefore we accept that, in some circumstances particular assessments may not be relevant to an application, or that an assessment may be adequately completed using a qualitative rather than quantitative methodology. In cases where this decision is made the promoters should fully explain and justify their rationale in the submitted documentation.

It is noted that the current proposals do not appear to consider possible health impacts of Electric and Magnetic Fields (EMF). The proposer should confirm either that the proposed development(s) does include or impact upon any potential sources of EMF; or ensure that an adequate assessment of the possible impacts is undertaken (see **Appendix A**) and included in the ES.

It is unclear at this point the extent to which some of the associated or supporting development, such as fuel storage, rail heads or the Lakeside waste management facility and electricity substation, will form part of the Development Consent Order (DCO) project. The current proposals suggest that the assessment will only consider the removal of these facilities (and not their replacement) as part of the DCO project. The intention is that the replacement of these facilities would be considered as part of the wider scheme and within the cumulative effects assessment as far as this is possible. In light of the nature of these facilities it may be prudent to include the removal and replacement of these facilities as part of the overall DCO project to ensure any public health issues are identified and appropriate mitigation measures implemented.

At this stage of the consultation, there is a level of uncertainty about the overall scope of the development, in light of this further consideration may be needed on the intention to screen out certain aspects from further assessment such as airborne aircraft emissions and the potential for regional ozone impacts. The complex nature of the proposed project and the associated development will require careful consideration of all the combined elements. Specific elements such as air quality or noise should not be considered in isolation, to ensure that any mitigation measures proposed for one aspect do not cause adverse impacts or unintended consequences for another.

Health and Wellbeing

The draft Airports NPS includes coverage of the four health and wellbeing (HWB) themes that PHE focuses on:

- Access. For example: access to local public services and recreational opportunities in the natural or urban environment (e.g. within assessment principles – health, paragraph 4.67)
- Traffic and Transport. For example: opportunities for walking and cycling, and the proposal's relationship with public transport (e.g. within assessment principles, paragraph 4.72 and specific impacts and requirements, paragraph 5.8)
- Socioeconomic. For example: the proposal's influence on employment and training opportunities (e.g. within specific impacts and requirements, paragraphs 5.21, 5.190, 5.228, 5.251, 5.252, 5.253 and 5.255).
- Land Use. For example: the quality of the natural environment (e.g. within specific impacts and requirements, paragraphs 5.105 – 5.125 and 5.202–5.214).

Given the relevance of the wider determinants of health and wellbeing to your proposed NSIP development, we ask that you assess the issues set out in HWB Scoping Appendix (**Appendix B**) either to confirm that there are no likely significant impacts or, if there are, to consider ways to enhance beneficial effects and avoid or, as a minimum, mitigate adverse effects.

This section and the associated health and wellbeing scoping table (see HWB Scoping Appendix – **Appendix B**), identifies the wider determinants of health and wellbeing we expect your assessment to address, to demonstrate whether they are likely to give rise to significant effects. PHE recognises that evaluating an NSIP's impacts on health through the wider determinants is more complex than assessing a project's direct impacts against clearly defined regulatory protections (e.g. protected species). However, this does not mean that their assessment should be side-lined; with the 2017 Environmental Impact Assessment (EIA) Regulations clarifying that the likely significant effects of a development proposal on human health must be assessed. PHE's expectations are that the proponent of an NSIP will conduct a proportionate and evidence-based assessment of indirect effects on health and wellbeing in line with the relevant regulatory and policy requirements. To assist developers PHE has focused its approach on scoping determinants of health and wellbeing under four themes, which have been derived from an analysis of the wider determinants of health mentioned in the National Policy Statements. The four themes are: - Access - Traffic and Transport – Socioeconomic – Land Use.

Feedback on your proposed approach to assessing impacts on health and wellbeing in the consultation document and PHE's views on the specific health determinants relevant to your proposal are included as a table in the HWB Scoping **Appendix B**. The table, in **Appendix B**, sets out information relevant to a series of specific health determinants under each of the themes listed above. PHE has identified that each of the determinants set out in the HWB Scoping **Appendix B** require further consideration in your assessment. The table also includes the following:

- evidence demonstrating the link between the determinant of health and related health outcomes

- some examples of key national policy documents related to this determinant Health and wellbeing must be considered within EIA, and both health and the wider determinants of health are included in all available National Policy Statements.

The attached appendices outline areas, which are relevant to this proposal that should be addressed by all promoters when preparing ES for inclusion with an NSIP submission. We are happy to assist and discuss proposals further in the light of this advice.

Yours faithfully,

Public Health England

nsipconsultations@phe.gov.uk

Please mark any correspondence for the attention of National Infrastructure Planning Administration.

Enclosed:
Appendix A – PHE recommendations regarding the environmental public health aspects of the scoping document
Appendix B – PHE's Detailed Health & Wellbeing Scoping Response
Appendix C - PHE scoping response - noise

Appendix A: PHE recommendations regarding the environmental public health aspects of the scoping document

General approach

The EIA should give consideration to best practice guidance such as the Government's Good Practice Guide for EIA[1]. It is important that the EIA identifies and assesses the potential public health impacts of the activities at, and emissions from, the development. Assessment should consider the construction, operational, and any associated decommissioning phases.

It is not PHE's role to undertake these assessments on behalf of promoters as this would conflict with PHE's role as an impartial and independent body.

We note that the information provided highlights a number of displaced uses or associated developments that will need to be constructed, but that some of these will be the subject of separate planning consent applications. We recommend that the EIA for this installation includes consideration of the impacts of these associated developments and that cumulative impacts are fully accounted for.

Consideration of alternatives (including alternative sites, choice of process, and the phasing of construction) is widely regarded as good practice. Ideally, EIA should start at the stage of site and process selection, so that the environmental merits of practicable alternatives can be properly considered. Where this is undertaken, the main alternatives considered should be outlined in the ES[2].

The following text covers a range of issues that PHE would expect to be addressed by the promoter. However this list is not exhaustive and the onus is on the promoter to ensure that the relevant public health issues are identified and addressed. PHE's advice and recommendations carry no statutory weight and constitute non-binding guidance.

Receptors

The ES should clearly identify the development's location and the location and distance from the development of off-site human receptors that may be affected by emissions from, or activities at, the development. Off-site human receptors may include people living in residential premises; people working in commercial, and industrial premises and people using transport infrastructure (such as roads and railways), recreational areas, and publicly-accessible land. Consideration should also be given to environmental receptors such as the surrounding land, watercourses, surface and groundwater, and drinking water supplies such as wells, boreholes and water abstraction points.

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[1] Environmental Impact Assessment: A guide to good practice and procedures - A consultation paper; 2006; Department for Communities and Local Government. Available from: http://webarchive.nationalarchives.gov.uk/20100410180038/http:/communities.gov.uk/planningandbuilding/planning/sustainabilityenvironmental/environmentalimpactassessment/

[2] DCLG guidance, 1999 http://www.communities.gov.uk/documents/planningandbuilding/pdf/155958.pdf

Impacts arising from construction and decommissioning
Any assessment of impacts arising from emissions due to construction and decommissioning should consider potential impacts on all receptors and describe monitoring and mitigation during these phases. Construction and decommissioning will be associated with vehicle movements and cumulative impacts should be accounted for.

We would expect the promoter to follow best practice guidance during all phases from construction to decommissioning to ensure appropriate measures are in place to mitigate any potential impact on health from emissions (point source, fugitive and traffic-related). An effective Construction Environmental Management Plan (CEMP) (and Decommissioning Environmental Management Plan (DEMP)) will help provide reassurance that activities are well managed. The promoter should ensure that there are robust mechanisms in place to respond to any complaints of traffic-related pollution, during construction, and decommissioning of the facility.

Emissions to air and water
PHE has a number of comments regarding emissions in order that the EIA provides a comprehensive assessment of potential impacts.

When considering a baseline (of existing environmental quality) and in the assessment and future monitoring of impacts these:

- should include appropriate screening assessments and detailed dispersion modelling where this is screened as necessary
- should encompass all pollutants which may be emitted by the installation in combination with all pollutants arising from associated development and transport, ideally these should be considered in a single holistic assessment
- should consider the construction, operational, and decommissioning phases
- should consider the typical operational emissions and emissions from start-up, shut-down, abnormal operation and accidents when assessing potential impacts and include an assessment of worst-case impacts
- should fully account for fugitive emissions
- should include appropriate estimates of background levels
- should identify cumulative and incremental impacts (i.e. assess cumulative impacts from multiple sources), including those arising from associated development, other existing and proposed development in the local area, and new vehicle movements associated with the proposed development; associated transport emissions should include consideration of non-road impacts (i.e. rail, sea, and air)
- should include consideration of local authority, Environment Agency, Defra national network, and any other local site-specific sources of monitoring data
- should compare predicted environmental concentrations to the applicable standard or guideline value for the affected medium (such as UK Air Quality Standards and Objectives and Environmental Assessment Levels)
    - If no standard or guideline value exists, the predicted exposure to humans should be estimated and compared to an appropriate health-based value (a Tolerable Daily Intake or equivalent). Further guidance is provided in **Annex 1**

    - This should consider all applicable routes of exposure e.g. include consideration of aspects such as the deposition of chemicals emitted to air and their uptake via ingestion
- should identify and consider impacts on residential areas and sensitive receptors (such as schools, nursing homes and healthcare facilities) in the area(s) which may be affected by emissions, this should include consideration of any new receptors arising from future development.

Whilst screening of impacts using qualitative methodologies is common practice (e.g. for impacts arising from fugitive emissions such as dust), where it is possible to undertake a quantitative assessment of impacts then this should be undertaken.

PHE's view is that the EIA should appraise and describe the measures that will be used to control both point source and fugitive emissions and demonstrate that standards, guideline values or health-based values will not be exceeded due to emissions from the installation, as described above. This should include consideration of any emitted pollutants for which there are no set emission limits. When assessing the potential impact of a proposed installation on environmental quality, predicted environmental concentrations should be compared to the permitted concentrations in the affected media; this should include both standards for short and long-term exposure.

Additional points specific to emissions to air
When considering a baseline (of existing air quality) and in the assessment and future monitoring of impacts these:

- should include consideration of impacts on existing areas of poor air quality e.g. existing or proposed local authority Air Quality Management Areas (AQMAs)
- should include modelling using appropriate meteorological data (i.e. come from the nearest suitable meteorological station and include a range of years and worst case conditions)
- should include modelling taking into account local topography

Additional points specific to noise
When considering a baseline (of the existing noise environment) and in the assessment and future monitoring of impacts these:

- should include a clear definition of the tests for determining significance of impacts, which need to be framed around impacts on health and quality of life, and not around noise exposure per se; PHE expects such tests to be discussed and agreed with relevant stakeholders, and that they take into account a number of factors (see **Appendix C** for further detail)
- should be based on noise modelling that reflects the scenario(s) that are most likely to deliver the operational noise mitigation strategies proposed by the applicant, together with suitable sensitivity analyses, in order to estimate as accurately as possible the scale of noise exposure.
- should make use of the best available evidence to quantify the effects on health and quality of life, including the evidence base on a "change effect"
- should ensure that proposed mitigation measures are underpinned by good quality evidence, in particular whether mitigation measures are achievable, whether they may have adverse consequences on other environmental factors

such as air quality and carbon emissions, and whether they are proven to reduce adverse impacts on health and quality of life.

Additional points specific to emissions to water
When considering a baseline (of existing water quality) and in the assessment and future monitoring of impacts these:

- should include assessment of potential impacts on human health and not focus solely on ecological impacts
- should identify and consider all routes by which emissions may lead to population exposure (e.g. surface watercourses; recreational waters; sewers; geological routes etc.)
- should assess the potential off-site effects of emissions to groundwater (e.g. on aquifers used for drinking water) and surface water (used for drinking water abstraction) in terms of the potential for population exposure
- should include consideration of potential impacts on recreational users (e.g. from fishing, canoeing etc) alongside assessment of potential exposure via drinking water.

Land quality
We would expect the promoter to provide details of any hazardous contamination present on site (including ground gas) as part of the site condition report.

Emissions to and from the ground should be considered in terms of the previous history of the site and the potential of the site, once operational, to give rise to issues. Public health impacts associated with ground contamination and/or the migration of material off-site should be assessed[3] and the potential impact on nearby receptors and control and mitigation measures should be outlined.
Relevant areas outlined in the Government's Good Practice Guide for EIA include:

- effects associated with ground contamination that may already exist
- effects associated with the potential for polluting substances that are used (during construction / operation) to cause new ground contamination issues on a site, for example introducing / changing the source of contamination
- impacts associated with re-use of soils and waste soils, for example, re-use of site-sourced materials on-site or offsite, disposal of site-sourced materials offsite, importation of materials to the site, etc.

Waste
The EIA should demonstrate compliance with the waste hierarchy (e.g. with respect to re-use, recycling or recovery and disposal).
For wastes arising from the installation the EIA should consider:

- the implications and wider environmental and public health impacts of different waste disposal options
- disposal route(s) and transport method(s) and how potential impacts on public health will be mitigated.

[3] Following the approach outlined in the section above dealing with emissions to air and water i.e. comparing predicted environmental concentrations to the applicable standard or guideline value for the affected medium (such as Soil Guideline Values)

Other aspects

Within the EIA PHE would expect to see information about how the promoter would respond to accidents with potential off-site emissions e.g. flooding or fires, spills, leaks or releases off-site. Assessment of accidents should: identify all potential hazards in relation to construction, operation and decommissioning; include an assessment of the risks posed; and identify risk management measures and contingency actions that will be employed in the event of an accident in order to mitigate off-site effects.

The EIA should include consideration of the Control of Major Accident Hazards (COMAH) Regulations and the Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations 2009: both in terms of their applicability to the installation itself, and the installation's potential to impact on, or be impacted by, any nearby installations themselves subject to the these Regulations.

There is evidence that, in some cases, perception of risk may have a greater impact on health than the hazard itself. A 2009 report[4], jointly published by Liverpool John Moores University and the Health Protection Agency, examined health risk perception and environmental problems using a number of case studies. As a point to consider, the report suggested: "Estimation of community anxiety and stress should be included as part of every risk or impact assessment of proposed plans that involve a potential environmental hazard. This is true even when the physical health risks may be negligible." PHE supports the inclusion of this information within EIAs as good practice.

Electromagnetic fields (EMF)

This statement is intended to support planning proposals involving electrical installations such as substations and connecting underground cables or overhead lines. PHE advice on the health effects of power frequency electric and magnetic fields is available in the following link:

https://www.gov.uk/government/collections/electromagnetic-fields#low-frequency-electric-and-magnetic-fields

There is a potential health impact associated with the electric and magnetic fields around substations, and power lines and cables. The field strength tends to reduce with distance from such equipment.

The following information provides a framework for considering the health impact associated with the electric and magnetic fields produced by the proposed development, including the direct and indirect effects of the electric and magnetic fields as indicated above.

[4] Available from: http://www.cph.org.uk/wp-content/uploads/2012/08/health-risk-perception-and-environmental-problems--summary-report.pdf

Policy Measures for the Electricity Industry

The Department of Energy and Climate Change has published a voluntary code of practice which sets out key principles for complying with the ICNIRP guidelines:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/37447/1256-code-practice-emf-public-exp-guidelines.pdf

Companion codes of practice dealing with optimum phasing of high voltage power lines and aspects of the guidelines that relate to indirect effects are also available:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48309/1255-code-practice-optimum-phasing-power-lines.pdf

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224766/powerlines_vcop_microshocks.pdf

Exposure Guidelines

PHE recommends the adoption in the UK of the EMF exposure guidelines published by the International Commission on Non-ionizing Radiation Protection (ICNIRP). Formal advice to this effect was published by one of PHE's predecessor organisations (NRPB) in 2004 based on an accompanying comprehensive review of the scientific evidence:-

http://webarchive.nationalarchives.gov.uk/20140629102627/http://www.hpa.org.uk/Publications/Radiation/NPRBArchive/DocumentsOfTheNRPB/Absd1502/

Updates to the ICNIRP guidelines for static fields have been issued in 2009 and for low frequency fields in 2010. However, Government policy is that the ICNIRP guidelines are implemented in line with the terms of the 1999 EU Council Recommendation on limiting exposure of the general public (1999/519/EC):

http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Publichealth/Healthprotection/DH_4089500

Static magnetic fields

For static magnetic fields, the ICNIRP guidelines published in 2009 recommend that acute exposure of the general public should not exceed 400 mT (millitesla), for any part of the body, although the previously recommended value of 40 mT is the value used in the Council Recommendation. However, because of potential indirect adverse effects, ICNIRP recognises that practical policies need to be implemented to prevent inadvertent harmful exposure of people with implanted electronic medical devices and implants containing ferromagnetic materials, and injuries due to flying ferromagnetic objects and these considerations can lead to much lower restrictions, such as 0.5 mT.

Power frequency electric and magnetic fields

At 50 Hz, the known direct effects include those of induced currents in the body on the central nervous system (CNS) and indirect effects include the risk of painful spark discharge on contact with metal objects exposed to the field. The ICNIRP guidelines published in 1998 give reference levels for public exposure to 50 Hz electric and magnetic fields, and these are respectively 5 kV m^{-1} (kilovolts per metre) and 100 μT (microtesla). The reference level for magnetic fields changes to 200 μT in the revised (ICNIRP 2010) guidelines because of new basic restrictions based on induced electric fields inside the body, rather than induced current density. If people are not exposed to field strengths above these levels, direct effects on the CNS should be avoided and indirect effects such as the risk of painful spark discharge will be small. The reference levels are not in themselves limits but provide guidance for assessing compliance with the basic restrictions and reducing the risk of indirect effects.

Long term effects

There is concern about the possible effects of long-term exposure to electromagnetic fields, including possible carcinogenic effects at levels much lower than those given in the ICNIRP guidelines. In the NRPB advice issued in 2004, it was concluded that the studies that suggest health effects, including those concerning childhood leukaemia, could not be used to derive quantitative guidance on restricting exposure. However, the results of these studies represented uncertainty in the underlying evidence base, and taken together with people's concerns, provided a basis for providing an additional recommendation for Government to consider the need for further precautionary measures, particularly with respect to the exposure of children to power frequency magnetic fields.

The Stakeholder Advisory Group on ELF EMFs (SAGE)

SAGE was set up to explore the implications for a precautionary approach to extremely low frequency electric and magnetic fields (ELF EMFs), and to make practical recommendations to Government:

http://www.emfs.info/policy/sage/

SAGE issued its First Interim Assessment in 2007, making several recommendations concerning high voltage power lines. Government supported the implantation of low cost options such as optimal phasing to reduce exposure; however it did not support the option of creating corridors around power lines on health grounds, which was considered to be a disproportionate measure given the evidence base on the potential long term health risks arising from exposure. The Government response to SAGE's First Interim Assessment is available here:

http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107124

The Government also supported calls for providing more information on power frequency electric and magnetic fields which are available on the PHE web pages (https://www.gov.uk/government/collections/electromagnetic-fields#low-frequency-electric-and-magnetic-fields).

Ionising radiation

Particular considerations apply when an application involves the possibility of exposure to ionising radiation. In such cases it is important that the basic principles of radiation protection recommended by the International Commission on Radiological Protection[5] (ICRP) are followed. PHE provides advice on the application of these recommendations in the UK. The ICRP recommendations are implemented in the Euratom Basic Safety Standards[6] (BSS) and these form the basis for UK legislation, including the Ionising Radiation Regulations 1999, the Radioactive Substances Act 1993, and the Environmental Permitting Regulations 2016.

PHE expects promoters to carry out the necessary radiological impact assessments to demonstrate compliance with UK legislation and the principles of radiation protection. This should be set out clearly in a separate section or report and should not require any further analysis by PHE. In particular, the important principles of justification, optimisation and radiation dose limitation should be addressed. In addition compliance with the Euratom BSS and UK legislation should be clear.

When considering the radiological impact of routine discharges of radionuclides to the environment PHE would expect to see a full radiation dose assessment considering both individual and collective (population) doses for the public and, where necessary, workers. For individual doses, consideration should be given to those members of the public who are likely to receive the highest exposures (referred to as the representative person, which is equivalent to the previous term, critical group). Different age groups should be considered as appropriate and should normally include adults, 1 year old and 10 year old children. In particular situations doses to the foetus should also be calculated[7]. The estimated doses to the representative person should be compared to the appropriate radiation dose criteria (dose constraints and dose limits), taking account of other releases of radionuclides from nearby locations as appropriate. Collective doses should also be considered for the UK, European and world populations where appropriate. The methods for assessing individual and collective radiation doses should follow the guidance given in 'Principles for the Assessment of Prospective Public Doses arising from Authorised Discharges of Radioactive Waste to the Environment August 2012 [8].It is

[5] These recommendations are given in publications of the ICRP notably publications 90 and 103 see the website at http://www.icrp.org/

[6] Council Directive 96/29/EURATOM laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation.

[7] HPA (2008) Guidance on the application of dose coefficients for the embryo, fetus and breastfed infant in dose assessments for members of the public. Doc HPA, RCE-5, 1-78, available at https://www.gov.uk/government/publications/embryo-fetus-and-breastfed-infant-application-of-dose-coefficients

[8] The Environment Agency (EA), Scottish Environment Protection Agency (SEPA), Northern Ireland Environment Agency, Health Protection Agency and the Food Standards Agency (FSA). Principles for the Assessment of Prospective Public Doses arising from Authorised Discharges of Radioactive Waste to the Environment August 2012. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296390/geho1202bklh-e-e.pdf