

Hampshire Water Transfer and Water Recycling Project

Environmental Statement - Appendix
11.2 Geotechnical and geo-
environmental reports- 14 of 18
documents - Geo-Environmental
Interpretative Report – Proposed Water
Recycling Plant appendices

VOLUME NUMBER: 6

PLANNING INSPECTORATE SCHEME NUMBER: WA010002

APPLICATION DOCUMENT REFERENCE: 6.2

APFP REGULATION: 5(2)(a)

May 2026

Version 0



from

**Southern
Water** 

Appendix C Environment Agency and Hampshire County Council Consultation Responses

[REDACTED]

From:
Sent:
To:
Cc:
Subject:

RE: Harts Farm Way / Brockhampton West Landfill - Permit History

Good afternoon [REDACTED]

Many apologies if we have not responded to your earlier request. Our enquiries team should be able to update you on the situation with this request.

I do have some knowledge of this site, but that is largely based on the site investigation that have taken place in association with the proposed redevelopment of part of the historic landfill. I believe these all should be on the Havant District council planning portal under the reference - APP/21/00189. I assume though you are already familiar with these reports.

According to our records the site was infilled (or deposited as land raise) between around 1969 and 1987. Although planning permission was stated as being granted in 1958, so some waste may have been deposited before 1969. The site is also recorded as being a dilute and disperse facility, so any engineering is likely to be minimal. The sea wall though adjacent to the site, may offer some barriers limiting migration. In terms of waste, the site is known to have taken household waste, as was as some commercial/industrial waste.

Given that it ceased active operation in 1987, I don't think it ever licenced/permited by the Environment Agency, and was probably regulated by Hampshire County Council. As such I don't think we would have any waste licencing/permit files.

The only other thing I can see on our records is that it was operated by "The Castle, Winchester, Hampshire".

I would though suggest, that if you not already done s
believe the site is owned by Havant District Council an
[REDACTED]
[REDACTED] mail is given below.

Kind Regards

[REDACTED]

[REDACTED]

Technical Specialist - (Groundwater Quality and Contaminated Land)
Solent and South Downs
Environment Agency

[REDACTED]

[REDACTED]

Subject:

RE: Former Brockhampton West Landfill - Information Enquiry

Attachments:

Decision Notice.pdf; Revised Layout - Landscaping.pdf

Hi ,

I'm happy to say that this is a bit before my time, or anyone here to be honest. The EA are correct to say that the site was never licensed or permitted by themselves and any activity from the mid 1970s would have been Licenced by the County Council (under the old Control of Pollution Act I think). However, that part of the County Council, the Waste Regulation Section, actually became the Environment Agency in 1996 (along with the old National Rivers Authority and HM Inspectorate of Pollution) and they took responsibility for the regulation and licencing/permitting of waste activities, and, consequently, took all the relevant files with them.

We, as Planning Authority, retained the planning files relevant to the actual planning permissions, however, given the age of the site these were all archived many years ago. I have had a look at the planning history for the site and, along with the ones you sent copies for, there was a further permission in 1970 for Landscaping Proposals for Storehouse Lake. I have attached the decision and plan attached to this permission in case they are of any use.

From a Planning perspective this site has now been completed for such a long time that there are no outstanding planning requirements. In terms of Licences, as the EA commented there was no modern Permit for the site so no modern conditions or surrender requirements, so again I do not think there will be any outstanding matters.

I hope this helps.

Regards,

[REDACTED]

Development Management and Minerals and Waste Policy

Universal Services

Ell Court West
The Castle
Winchester
Hampshire
SO23 8UD



Hampshire Services offers a range of professional consultancy services to partner organisations.
www.hants.gov.uk/sharedexpertise

HAMPSHIRE COUNTY COUNCIL

TOWN AND COUNTRY PLANNING ACT, 1962

TOWN AND COUNTRY PLANNING GENERAL DEVELOPMENT ORDER, 1963

To:— Havant & Waterloo Urban District Council,
c/o The Director of Technical Services,
Elmleigh Road,
HAVANT,
Hants.

Plan No. HWU.14239/8

PLOTTED	✓
B.I. CARD	✓
REGR.	✓
STATS.	X
FILE	

In pursuance of their powers under the above-mentioned Act and Order, the Council, as the local planning authority, hereby approve the detailed plans, drawings and particulars relating to landscaping proposals for Storehouse Lake, Bedhampton,

submitted on 5th November, 1969, in accordance with the conditions subject to which outline planning permission was granted under Article 5(2) of the Town and Country Planning General Development Order, 1963, under Plan No. HWU.14239/3 L, in respect of the use of land at Storehouse Lake, Bedhampton, as a controlled tip, quay, slipway and dinghy park and construction of channel diversion and road. as amended
by plans
received
14.1.70

This approval is granted subject to due compliance with the conditions imposed on the grant of the aforementioned outline planning permission and to the following:

~~For reasons for the foregoing conditions see~~

THE CASTLE,
WINCHESTER.

On behalf of the Local Planning Authority.

Date 13 FEB 1970

NOTES: (1) Notwithstanding the terms of the condition attached to the outline permission, requiring detailed plans to be submitted before development commences, the approval hereby granted authorises the commencement of so much of the development as is specified above. Attention is, however, drawn to the need to submit such further detailed plans, if any, as are required by the outline permission before any development other than that specified above is commenced.

(2) It is essential that this approval is read in conjunction with the outline planning permission originally granted for the development in question and with any conditions then imposed.

(3) This approval does not purport to convey any approval or consent which may be required under the Town and Country Planning Act, 1962, otherwise than under Sections 17—20 of that Act, or which may be required under any other Acts, including any Byelaws, Orders or Regulations made under such other Acts.

(4) **Public Rights of Way.** Developers are reminded that the grant of planning permission does not entitle them to obstruct a right of way and that, if it is necessary to stop up or divert a right of way in order to enable the development to be carried out, they should apply without delay to the Minister of Transport for an Order under Section 153 of the Town and Country Planning Act, 1962; development must not be started until this has been obtained.

NOTIFICATION

(1) If the applicant is aggrieved by the decision to refuse permission or approval for the proposed development, or to grant permission or approval subject to conditions, he may, by notice served within one month of receipt of this notice, appeal to the Minister of Housing and Local Government in accordance with Section 23 of the Town and Country Planning Act, 1962.

The Minister has power to allow a longer period for the giving of a Notice of Appeal and he will exercise his power in cases where he is satisfied that the applicant has deferred the giving of notice because negotiations with the local planning authority in regard to the proposed development are in progress. The Minister is not, however, required to entertain such an appeal if it appears to him that permission for the proposed development could not have been granted by or on behalf of the local planning authority, or could not have been so granted otherwise than subject to the conditions imposed by them, having regard to the provisions of the development order and to any directions given under the order.

(2) If permission to develop the land is refused, or granted subject to conditions, whether by or on behalf of the local planning authority or by the Minister of Housing and Local Government, and the owner of the land claims that the land has become incapable of reasonably beneficial use in its existing state and cannot be rendered capable of reasonably beneficial use by the carrying out of any development which has been or would be permitted, he may serve on the Council of the county borough or county district in which the land is situated a purchase notice requiring that Council to purchase his interest in the land in accordance with the provisions of Part VIII of the Town and Country Planning Act, 1962.

(3) In certain circumstances, a claim may be made against the local planning authority for compensation, where permission is refused, or granted subject to conditions by the Minister on appeal or on a reference of the application to him. The circumstances in which such compensation is payable are set out in Section 123 of the Town and Country Planning Act, 1962.

(4) An applicant who wishes to appeal against a decision should write to the Minister of Housing and Local Government, Whitehall, London, S.W.1.

(5) The applicant is recommended to retain this form with the title deeds of the property.

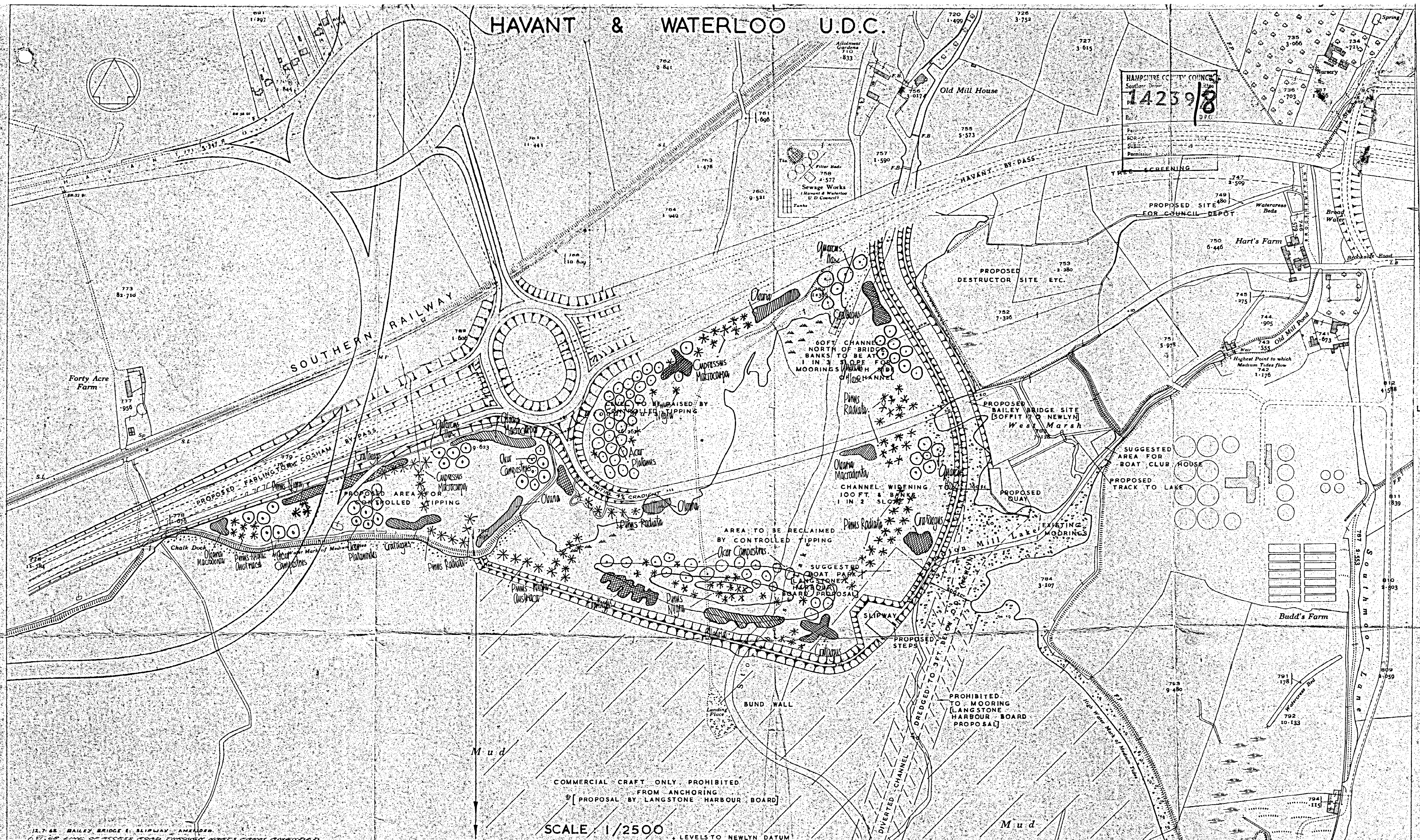
(6) In cases where a Government Department has expressed views on the proposals which are incorporated in the reasons for refusal or for the imposition of conditions and the applicant wishes to lodge an appeal against such decision then a representative from that Government Department will attend any Planning Inquiry and be available to give evidence if the appellant asks for the presence of such a witness at the Inquiry. In such cases the appellant should notify the Council at the address given on the front of this form without delay. The representative would not be liable to cross-examination on questions of Ministerial policy but only on matters of fact and expert opinion.

NOTICE

Attention is drawn to the fact that any failure to adhere to the details of the plans hereby approved or to comply with any conditions detailed in this notice would constitute a contravention of the provisions of the Town and Country Planning Act, 1962, in respect of which enforcement action might be taken.

If it is desired to depart in any way from the proposals as approved, an amended application should be made to the Council at the address overleaf.

HAVANT & WATERLOO U.D.C.

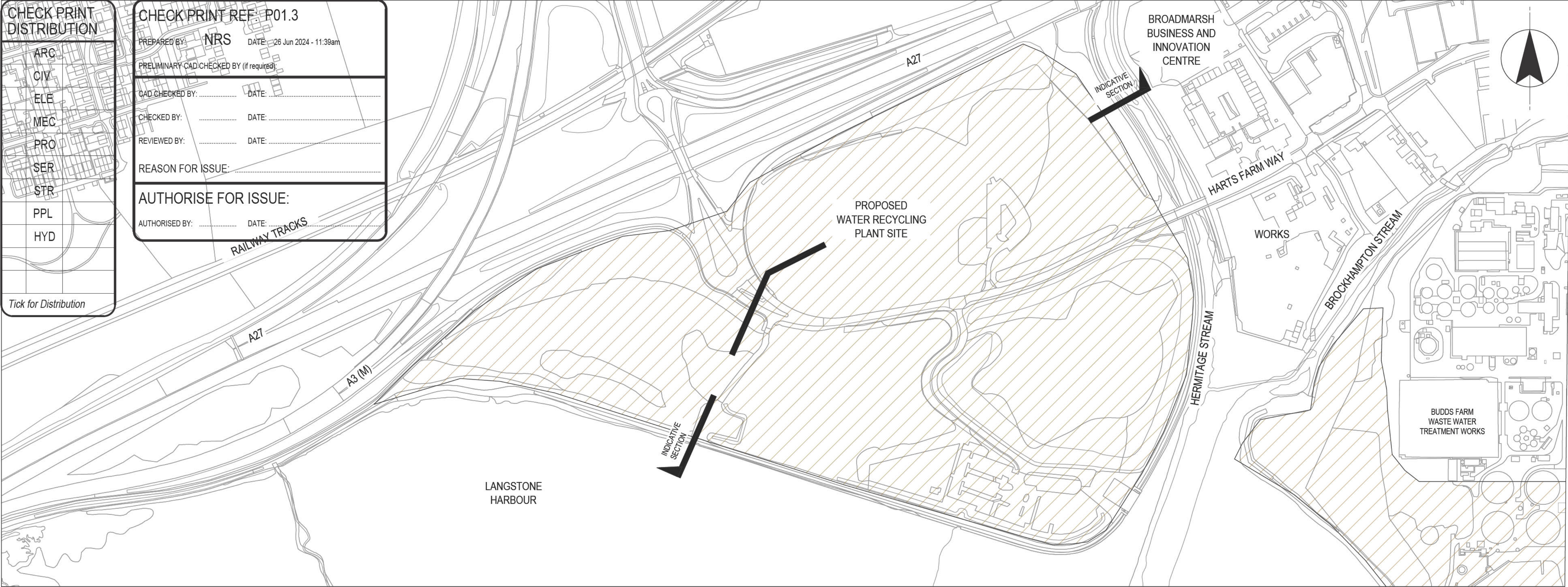


DRAWING No. 639/117
DRAWN BY D.F.
TRACED BY
CHECKED BY
DATE DECEMBER 1968

PROPOSED RECLAMATION OF STOREHOUSE LAKE.
REVISED LAYOUT, - LANDSCAPING

F. J. JOHNSON. A.M.I.C.E. M.I.MUN.E
A.M.I.STRUCTE
ENGINEER & SURVEYOR.
HAVANT.

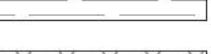
Appendix D Schematic Conceptual Site Model

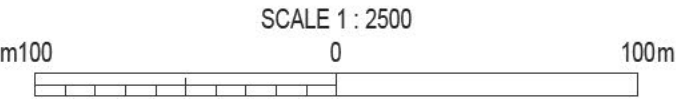


LOCATION PLAN

SCALE 1:2500

1. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES UNLESS SHOWN OTHERWISE.

	INDICATIVE WATER / LEACHATE LEVEL (NOTE: WATER / LEACHATE LEVEL IN LANDFILL IS TIDALLY INFLUENCED - 1.0 TO 1.3m RANGE)
	LANDFILL COVER SOILS (VARIABLY SANDY AND GRAVELLY CLAY)
	LANDFILL WASTE (DOMESTIC, COMMERCIAL AND INDUSTRIAL)
	LANDFILL GAS
	ALLUVIUM - SOFT SLIGHTLY GRAVELLY SOIL
	RIVER TERRACE DEPOSITS - SLIGHTLY CLAYEY SANDY GRAVEL
	CHALK - Dm TO Dc BECOMING C2 TO B2 WITH DEPTH



CURRENT VERSION INFORMATION

26/06/24	---	---	---	---	P01.3	SO	Initial Status or WIP
DATE	ORIG	CHKD	REVD	APPR	REV	STS	REASON FOR ISSUE

THIS DRAWING IS ISSUED BY SOUTHERN WATER SUBJECT TO THE CONDITIONS THAT IT IS
NOT COPIED EITHER IN WHOLE OR IN PART OR DISCLOSED TO THIRD PARTIES
UNLESS PRIOR WRITTEN AUTHORISATION IS GIVEN BY SOUTHERN WATER

PREVIOUS VERSIONS OF THIS DRAWING SHOULD BE STAMPED SUPERSEDED OR DESTROYED

DO NOT SCALE THIS DRAWING - IF IN DOUBT ASK



PROJECT TITLE

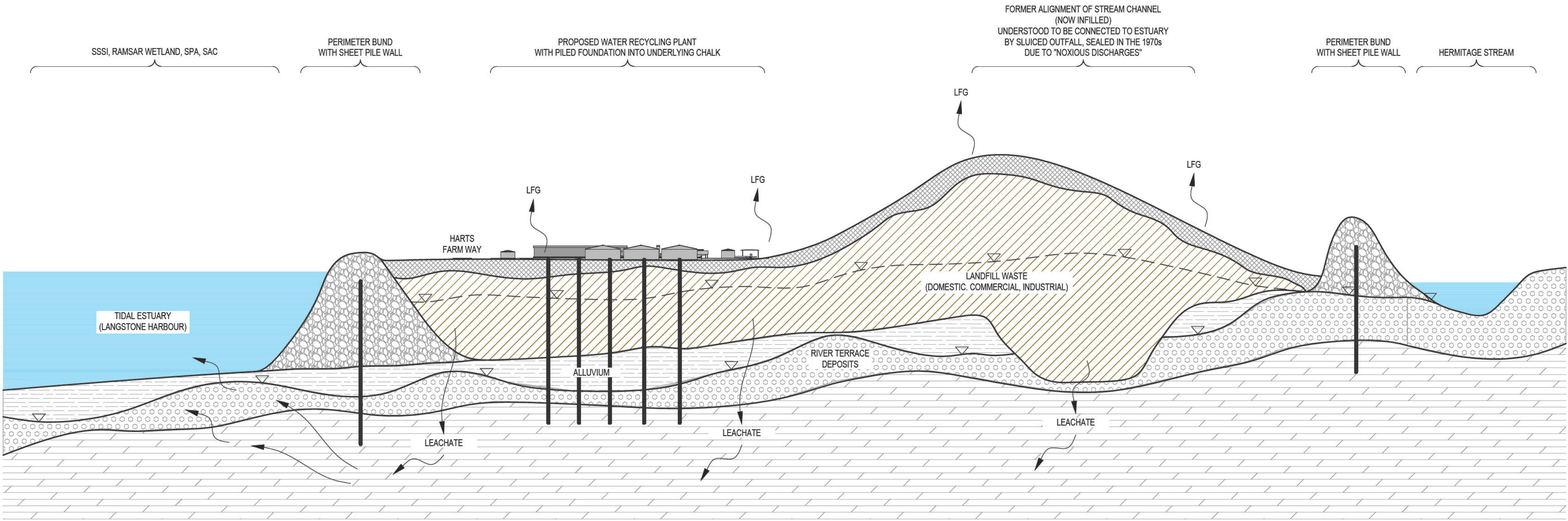
HAMPSHIRE WATER TRANSFER AND
WATER RECYCLING PROJECT

DRAWING TITLE

LAND PARCEL 72

PROPOSED WATER RECYCLING PLANT

SITE UNIT MNEUMONIC	SITE UNIT NO.	MASTER SIZE	A1
SPRN 710166	SCALE 1:5000	STATUS	S0
3.3 W. DRAWING NO. 710166-SWS-XX-XX-DR-Z-02201			REVISION P01.3



INDICATIVE SECTION
SCALE NTS

Appendix E Tables of Estimated Risk



Appendix D – Risk Assessment Tables (PSC1 & 2 – Harts Farm Way Landfill)

PSC No. 1 & 2	Harts Farm Way Landfill; Site Reference FHA15, 1760/1/13/6 – BASELINE PHASE					
Potential Source of Contamination	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
Household, commercial and industrial waste types. The depth to the base of the waste material (where encountered) ranges between 5.5m bgl to 13.9m bgl (east area) and 8.2-11.5m bgl (west area).	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) (including phenols), per-and polyfluorinated alkyl substances (PFAS).	Human Health – On-site: Not Applicable as receptor is not present at baseline. Site is vacant with no public footpaths.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
		Human Health – Off-site: Workers at adjacent business park, yard, aggregates wharf etc.	Ingestion and inhalation of dusts, and particles	Medium	Unlikely	Low
		Groundwater (resource): Raised Marine Deposits (Secondary Undifferentiated Aquifer) over Chalk (Principal Aquifer). Alluvium (land immediately east of the landfill) (Secondary A Aquifer). Potable abstractions have not been identified within 250 m of the Site. The Site is located within reclaimed former marine land where saline groundwater conditions are likely to be prevalent and potable abstraction is unlikely to be viable.	Groundwater within permeable natural strata as a pathway allowing migration of mobile contamination leached from contaminated soils. Groundwater migrating via anthropogenic routes e.g., boreholes, landfill waste mass etc.	Severe	Low (unlikely that aquifer will be utilised)	Moderate
		Groundwater (biodiversity): The EA's Catchment Data Explorer indicates that the groundwater beneath the Site received an WFD classification of Poor in 2019 for chemical quality.		Medium	High	High
		Surface Water (resource): Not Applicable as surface water abstractions have not been identified within 250 m of the Site.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
		Surface Water (biodiversity): The Hermitage Stream, located immediately east of the Site, received a WFD classification of Moderate for Ecological Quality in 2019.	Runoff or discharges to surface water via existing drainage network, e.g., historical land drains, highway drainage. Deposition of wind-blown dust Recharge of surface water via contaminated groundwater	Severe	High	Very High
		Ecologically Sensitive Sites: Langstone Harbour (Special Protected Area, Ramsar and SSSI) located approximately 200 m to the south of the Site.	Runoff or discharges to surface water via existing drainage network, e.g., historical land drains, highway drainage. Deposition of wind-blown dust Recharge of surface water via contaminated groundwater	Medium	Likely	Moderate
		Geodiversity: Not Applicable as the Site is not located within 1.0 km of any geologically designated SSSI or geologically designated Local Site (RIGS).	Not Applicable	Not Applicable	Not Applicable	Not Applicable

Appendix D – Risk Assessment Tables (PSC1 & 2 – Harts Farm Way Landfill)

PSC No. 1 & 2	Harts Farm Way Landfill; Site Reference FHA15, 1760/1/13/6 – BASELINE PHASE					
Potential Source of Contamination	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
		Property – Buildings and Archaeology: A single listed structure is present, approximately 190 m north (i.e., hydraulically upgradient) of the Site. It is considered highly unlikely that this property would experience any impacts due to the construction of the proposed development, e.g., migration of contamination. A safeguarded mineral wharf is present approximately 100 m east of the Site. Assorted commercial properties and a gas peaking plant are also present within 250 m of the Site.	Direct contact – Sulphate attack on concrete, hydrocarbon corrosion / permeation of plastic pipes.	Medium	Low	Low / Moderate
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	Human Health – On-site: Not Applicable as receptor is not present at baseline. Site is vacant with no public footpaths.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
		Human Health – Off-site: Workers at adjacent business park, yard, aggregates wharf etc.	Inhalation of gases and vapours within buildings.	Severe	Likely	High

Appendix D – Risk Assessment Tables (PSC1 & 2 – Harts Farm Way Landfill)

PSC No. 1 & 2	Harts Farm Way Landfill; Site Reference FHA15, 1760/1/13/6 – CONSTRUCTION PHASE					
Potential Source of Contamination	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
Household, commercial and industrial waste types. The depth to the base of the waste material (where encountered) ranges between 5.5m bgl to 13.9m bgl (east area) and 8.2-11.5m bgl (west area).	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) (including phenols), per-and polyfluorinated alkyl substances (PFAS).	Human Health – On-site: Construction workers during excavations/construction of WRP and associated shafts and infrastructure.	Direct dermal contact, ingestion and inhalation of dusts.	Severe	High	Very High
		Human Health – Off-site: Workers at adjacent business park, yard, aggregates wharf etc.	Ingestion and inhalation of dusts and particles	Medium	Low	Low / Moderate
		Groundwater (resource): Raised Marine Deposits (Secondary Undifferentiated Aquifer) over Chalk (Principal Aquifer). Alluvium (land immediately east of the landfill) (Secondary A Aquifer). Potable abstractions have not been identified within 250 m of the Site. The Site is located within reclaimed former marine land where saline groundwater conditions are likely to be prevalent and potable abstraction is unlikely to be viable.	Groundwater within permeable natural strata as a pathway allowing migration of mobile contamination leached from contaminated soils. Groundwater migrating via anthropogenic routes e.g., boreholes, landfill waste mass etc.	Severe	Low (unlikely that aquifer will be utilised)	Moderate
		Groundwater (biodiversity): The EA's Catchment Data Explorer indicates that the groundwater beneath the Site received an WFD classification of Poor in 2019 for chemical quality.		Medium	High	High
		Surface Water (resource): Not Applicable as surface water abstractions have not been identified within 250 m of the Site.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
		Surface Water (biodiversity): The Hermitage Stream, located immediately east of the Site, received a WFD classification of Moderate for Ecological Quality in 2019.	Runoff or discharges to surface water via existing drainage network, e.g., historical land drains, highway drainage. Deposition of wind-blown dust Recharge of surface water via contaminated groundwater	Severe	High	Very High
		Ecologically Sensitive Sites: Langstone Harbour (Special Protected Area, Ramsar and SSSI) located approximately 200 m to the south of the Site.	Runoff or discharges to surface water via existing drainage network, e.g., historical land drains, highway drainage. Deposition of wind-blown dust Recharge of surface water via contaminated groundwater	Medium	Likely	Moderate
		Geodiversity: Not Applicable as the site is not located within 1.0 km of any geologically designated SSSI or geologically designated Local Site (RIGS).	Not Applicable	Not Applicable	Not Applicable	Not Applicable
		Property – Buildings and Archaeology: WRP and associated infrastructure, alongside off-site receptors identified by baseline.	Direct contact – Sulphate attack on concrete, hydrocarbon corrosion / permeation of plastic pipes.	Medium	High	High

Appendix D – Risk Assessment Tables (PSC1 & 2 – Harts Farm Way Landfill)

PSC No. 1 & 2	Harts Farm Way Landfill; Site Reference FHA15, 1760/1/13/6 – CONSTRUCTION PHASE					
Potential Source of Contamination	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	Human Health – On-site: Construction workers during excavations/construction of WRP and associated shafts and infrastructure.	Inhalation of gases and vapours within excavations, site cabins and temporary buildings.	Severe	High	Very High
		Human Health – Off-site: Workers at adjacent business park, yard, aggregates wharf etc.	Inhalation of gases and vapours within buildings.	Severe	Likely	High

Appendix D – Risk Assessment Tables (PSC1 & 2 – Harts Farm Way Landfill)

PSC No. 1 & 2	Harts Farm Way Landfill; Site Reference FHA15, 1760/1/13/6 – OPERATIONAL PHASE					
Potential Source of Contamination	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
Household, commercial and industrial waste types. The depth to the base of the waste material (where encountered) ranges between 5.5m bgl to 13.9m bgl (east area) and 8.2-11.5m bgl (west area).	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) (including phenols), per-and polyfluorinated alkyl substances (PFAS).	Human Health – On-site: Workers at completed development, groundworkers undertaking in-ground maintenance work	Direct dermal contact, ingestion and inhalation of dusts.	Medium	Unlikely	Low
		Human Health – Off-site: Workers at adjacent business park, yard, aggregates wharf etc.	Ingestion and inhalation of dusts and particles	Medium	Unlikely	Low
		Groundwater (resource): Raised Marine Deposits (Secondary Undifferentiated Aquifer) over Chalk (Principal Aquifer). Alluvium (land immediately east of the landfill) (Secondary A Aquifer). Potable abstractions have not been identified within 250 m of the Site. The Site is located within reclaimed former marine land where saline groundwater conditions are likely to be prevalent and potable abstraction is unlikely to be viable.	Groundwater within permeable natural strata as a pathway allowing migration of mobile contamination leached from contaminated soils. Groundwater migrating via anthropogenic routes e.g., boreholes, landfill waste mass etc.	Severe	Low (unlikely that aquifer will be utilised)	Moderate
		Groundwater (biodiversity): The EA's Catchment Data Explorer indicates that the groundwater beneath the Site received an WFD classification of Poor in 2019 for chemical quality.		Medium	High	High
		Surface Water (resource): Not Applicable as surface water abstractions have not been identified within 250 m of the Site.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
		Surface Water (biodiversity): The Hermitage Stream, located immediately east of the Site, received a WFD classification of Moderate for Ecological Quality in 2019.	Runoff or discharges to surface water via existing drainage network, e.g., historical land drains, highway drainage. Deposition of wind-blown dust Recharge of surface water via contaminated groundwater	Severe	High	Very High
		Ecologically Sensitive Sites: Langstone Harbour (Special Protected Area, Ramsar and SSSI) located approximately 200 m to the south of the Site.	Runoff or discharges to surface water via existing drainage network, e.g., historical land drains, highway drainage. Deposition of wind-blown dust Recharge of surface water via contaminated groundwater	Medium	Likely	Moderate
		Geodiversity: Not Applicable as the Site is not located within 1.0 km of any geologically designated SSSI or geologically designated Local Site (RIGS).	Not Applicable	Not Applicable	Not Applicable	Not Applicable
		Property – Buildings and Archaeology: Completed WRP and associated infrastructure, alongside off-site receptors identified at baseline.	Direct contact – Sulphate attack on concrete, hydrocarbon corrosion / permeation of plastic pipes.	Medium	High	High

Appendix D – Risk Assessment Tables (PSC1 & 2 – Harts Farm Way Landfill)

PSC No. 1 & 2	Harts Farm Way Landfill; Site Reference FHA15, 1760/1/13/6 – OPERATIONAL PHASE					
Potential Source of Contamination	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	Human Health – On-site: Workers at the completed development.	Inhalation of gases and vapours within enclosed spaces / buildings.	Severe	High	Very High
		Human Health – Off-site: Workers at adjacent business park, yard, aggregates wharf etc.	Inhalation of gases and vapours within buildings.	Severe	Likely	High

Appendix D – Risk Assessment Tables (PSC3 – Former Sewage Works)

PSC No. 3	Former Sewage Works (off-site, approximately 50 m to the north) – BASELINE PHASE					
Potential Source of Contamination	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
Former sewage works, infrastructure no longer shown apart from circular tank bases. Area is shown as green on aerial mapping and potentially overgrown. Mature vegetation on boundary	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene (BTEX), total phenols polychlorinated biphenyls (PCBs), PFAS and pathogens.	Human Health – On-site: Not Applicable as receptor is not present at baseline. Site is vacant with no public footpaths.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
		Groundwater (resource): Raised Marine Deposits (Secondary Undifferentiated Aquifer) over Chalk (Principal Aquifer). Alluvium (land immediately east of the landfill) (Secondary A Aquifer).	Groundwater within permeable natural strata as a pathway allowing migration of mobile contamination leached from contaminated soils. Groundwater migrating via anthropogenic routes e.g., boreholes, landfill waste mass etc.	Medium	Low (unlikely that aquifer will be utilised) Contaminant concentrations in groundwater are likely to be reduced due to dilution / dispersion.	Low / Moderate
		Potable abstractions have not been identified within 250 m of the Site. The Site is located within reclaimed former marine land where saline groundwater conditions are likely to be prevalent and potable abstraction is unlikely to be viable.				
		Groundwater (biodiversity): The EA's Catchment Data Explorer indicates that the groundwater beneath the Site received an WFD classification of Poor in 2019 for chemical quality.				
		Property – Buildings and Archaeology: Not Applicable. Structures are not present on the Site at baseline.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	Human Health – On-site: Not Applicable as receptor is not present at baseline. Site is vacant with no public footpaths.	Not Applicable	Not Applicable	Not Applicable	Not Applicable

Note: This table only includes assessment of the risk presented by the off-site source to the on-site receptors. Assessment of the risk presented by the off-site source to the off-site receptors is beyond the scope of this assessment.

Appendix D – Risk Assessment Tables (PSC3 – Former Sewage Works)

PSC No. 3	Former Sewage Works (off-site, approximately 50 m to the north) – CONSTRUCTION PHASE					
Potential Source of Contamination	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
Former sewage works, infrastructure no longer shown apart from circular tank bases. Area is shown as green on aerial mapping and potentially overgrown. Mature vegetation on boundary	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene (BTEX), total phenols polychlorinated biphenyls (PCBs), PFAS and pathogens.	Human Health – On-site: Construction workers during excavations/construction of WRP and associated shafts and infrastructure.	Ingestion and inhalation of dusts and particles.	Severe	Low	Moderate
		Groundwater (resource): Raised Marine Deposits (Secondary Undifferentiated Aquifer) over Chalk (Principal Aquifer). Alluvium (land immediately east of the landfill) (Secondary A Aquifer). Potable abstractions have not been identified within 250 m of the Site. The Site is located within reclaimed former marine land where saline groundwater conditions are likely to be prevalent and potable abstraction is unlikely to be viable.	Groundwater within permeable natural strata as a pathway allowing migration of mobile contamination leached from contaminated soils. Groundwater migrating via anthropogenic routes e.g., boreholes, landfill waste mass etc.	Medium	Low (unlikely that aquifer will be utilised) Contaminant concentrations in groundwater are likely to be reduced due to dilution / dispersion.	Low / Moderate
		Groundwater (biodiversity): The EA's Catchment Data Explorer indicates that the groundwater beneath the Site received an WFD classification of Poor in 2019 for chemical quality.				
		Property – Buildings and Archaeology: WRP and associated infrastructure.	Direct contact – Sulphate attack on concrete, hydrocarbon corrosion / permeation of plastic pipes.	Medium	Low Contaminant concentrations migrating onto site within in groundwater are likely to be reduced due to dilution / dispersion.	Low / Moderate
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	Human Health – On-site: Construction workers during excavations/construction of WRP and associated shafts and infrastructure.	Inhalation of gases and vapours within excavations, site cabins and temporary buildings.	Severe	Low	Moderate

Note: This table only includes assessment of the risk presented by the off-site source to the on-site receptors. Assessment of the risk presented by the off-site source to the off-site receptors is beyond the scope of this assessment.

Appendix F Rationale for Selection of Evaluation Criteria for Generic Quantitative Risk Assessment

Stantec/UK/I&B: Evaluation Criteria for Generic Quantitative Risk Assessment (England)

1 INTRODUCTION

The aim of this document is to present an explanation for the selection of the evaluation criteria routinely used by Stantec UK Ltd when undertaking a land contamination Tier 2 Generic Quantitative Risk Assessment (GQRA).

A GQRA uses published criteria to screen the site-specific contamination testing data and identify potential hazards to specific receptors. Generic criteria are typically conservative in derivation and exceedance does not indicate that a site is statutorily contaminated and/or unsuitable for use in the planning context. These criteria are used to identify situations where further assessment and/or action may be required. This document is divided into general introductory text and sections on soils, waters and gases.

2 GENERAL NOTES

This document should be read in conjunction with another entitled "Stantec Methodology for Assessment of Land Contamination" which summarises the legislative regime and our approach to ground contamination and risk assessment.

Any Stantec interpretation of contamination test results is based on a scientific and engineering appraisal. The perceptions of, for example, banks, insurers, lay people etc are not taken into account.

Any tables included in this document are produced for ease of reference to the criteria, they do not in any way replace the documents of origin (which are fully referenced) and which should be read to ensure appropriate use and interpretation of the data.

Generic criteria provide an aid to decision-making, but they do not replace the need for sound professional judgement in risk assessment (EA, 2006). The criteria are based on numerous and complex assumptions. The appropriateness of these assumptions in a site-specific context requires confirmation on a project by project basis. Our interpretative report will comment on the appropriateness of the routine criteria for project objectives or ground conditions. In some cases the published criteria whilst typically conservative may in some circumstances not be suitable for the site being assessed, either because they do not address the identified pollutant linkages or because they may not be sufficiently precautionary in the context of the site. Under these circumstances it may be necessary to recommend deriving site-specific assessment criteria. Any deviation from the routine criteria and/or selection of criteria for parameters not covered in this document will be described in the report text.

3 CRITERIA FOR EVALUATING SOIL RESULTS

3.1 Potential Harm to Human Health

The criteria used by Stantec UK Ltd to assess the potential for harm to human health are:-

- Category 4 Screening Levels (C4SLs) (Phase 1 substances DEFRA, 2014 and Phase 2 substances CLAIRE, 2021).
- Suitable 4 Use Levels (S4ULs) (Nathanail *et al*, 2015).
- CL:AIRE/EIC/AGS Generic Assessment Criteria (GAC) (CL:AIRE, 2010).
- Soil Guideline Values (SGVs) (EA, 2009a).

These criteria have been generated using the Contaminated Land Exposure Assessment model (CLEA) and supporting technical guidance (EA, 2009b, 2009c, 2009d, 2009e). The CLEA model uses generic assumptions about the fate and transport of chemicals in the environment and a generic conceptual model for site conditions and human behaviour to estimate child and adult exposures to soil contaminants for those potentially living, working, and/or playing on contaminated sites over long time periods (EA, 2009c).

The S4ULs, SGVs and GACs are all based on use of minimal/tolerable risk Health Criteria Values (HCVs) as the toxicological benchmark whereas the C4SL are based on use of a "low level of toxicological concern" (LLTC) as the toxicological benchmark. The LLTC represents a slightly higher level of risk than the HCV.

An update to the software (1.071) was published on 04/09/2015 (the handbook (EA 2009f) referring to version 1.05 is still valid). The update includes the library data sets from the DEFRA research project SP1010 (Development of Category 4 Screening Levels for assessment of land affected by contamination).

The CLEA model uses ten exposure pathways (Ingestion (outdoor soil, indoor dust, homegrown vegetables and soil attached to homegrown vegetables), Dermal Contact (outdoor soil and indoor dust) and Inhalation (outdoor dust, indoor dust, outdoor vapours and indoor vapours)). There are exposure pathways not included in the CLEA model such as the permeation of organics into plastic water supply pipes.

The presence and/or significance of each of the potential exposure pathways is dependent on the land use being considered. The model uses standard land use scenarios as follows:-

Residential – habitation of a dwelling up to two

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

storeys high with various default material and design parameters, access to either private or nearby community open space with soil track back to form indoor dust. Assumes ingestion of homegrown produce.

Allotments – the model has default parameters for use and consumption of vegetables but not animals or their products (eggs).

Industrial/Commercial – assumes office or light physical work in a permanent three storey structure with breaks taken outside and that the site is NOT covered in hardstanding.

Public Open Space – two public open space (POS) scenarios are considered: POS_{resi} is shared communal space within a residential development where tracking back of soil into the home is assumed to occur. POS_{park} is intended for a public park sufficiently distant from housing (i.e. not adjacent to housing) such that tracking back of soil into the home is negligible. Note that the POS assessment criteria may not be appropriate for assessing sports fields.

The assessment criteria generated using CLEA can be used as a conservative starting point for evaluating long-term risks to human health from chemicals in soil.

It is important to note that the model does not assess all the potential exposure scenarios, for example risk to workers in excavations (short term exposure) or diffusion of contaminants through drinking water pipes.

Recent guidance (DEFRA 2012) introduces a four stage classification system where Category 1 sites are clearly contaminated land and Category 4 sites are definitely not contaminated land as defined by EPA 1990. Outside of these categories further specific risk assessment is required to determine if the site should fall into Category 2 (contaminated land) or Category 3 (not contaminated land). Category 4 screening values are considered to be more pragmatic than the current published SGV/GAC criteria but still strongly precautionary with the aim of allowing rapid identification of sites where the risk is above minimal but still low/acceptable.

Category 4 Screening Levels (C4SLs)

At the end of 2013, technical guidance in support of DEFRA's revised Statutory Guidance (SG) was published and then revised in 2014 (CL:AIRE 2014) which provided:

- A methodology for deriving C4SLs for the standard land-uses and two new public open space scenarios using the updated assumptions relating to the modelling of human exposure to soil contaminants; and
- A demonstration of the methodology, via the

derivation of C4SLs for six substances – arsenic, benzene, benzo(a)pyrene, cadmium, chromium (VI) and lead.

Following issue of an Erratum in December 2014, a Policy Companion Document was published (DEFRA 2014).

A letter from Lord de Mauley dated 3rd September 2014 provides more explicit direction to local authorities on the use of the C4SL in a planning context. The letter identifies four key points:

- 1) that the screening values were developed expressly with the planning regime in mind
- 2) their use is recommended in DCLG's planning guidance
- 3) soil concentrations below a C4SL limit are considered to be 'definitely not contaminated' under Part IIA of the 1990 Environmental Protection Act and pose at most a 'low level of toxicological concern' and,
- 4) exceedance of a C4SL screening value does not mean that land is definitely contaminated land, just that further investigation may be warranted.

Stantec use the C4SLs as the Tier 2 soil screening criteria protective of human health for substances with C4SL available. Table 1 summarises the C4SL for each of the published substances.

Note that, with the exception of benzene, the DEFRA published C4SL are not dependent on soil organic matter content (SOM) ("*Given that BaP is non volatile and that empirical soil to plant concentration factors have been used, soil organic matter content has a negligible influence on the C4SLs for this chemical*"). The DEFRA published C4SL for benzene is based on an SOM of 6%. Stantec has used the CLEA model (v1.071) to derive C4SL for benzene for 1% and 2.5% SOM which are also shown in Table 1.

Note that an industry led project to derive C4SL for a further 20 substances has commenced (CL:AIRE, 2018). The project is being project managed by CL:AIRE and is funded by the Soil and Groundwater Technology Association (SAGTA), the Society of Brownfield Briefing (SoBRA) and others. A dedicated steering group, made up of representatives from SAGTA, DEFRA, Welsh Government, Public Health England, Environment Agency, Natural Resources Wales, Food Standards Agency, Homes England and further Land Forum representatives, has been set up to oversee the project. The new C4SL will be added to this document as they are published.

Suitable 4 Use Levels (S4ULs)

In July 2009, Generic Assessment Criteria (GACs)

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

for 82 substances were published (LQM and CIEH, 2009) using the then current version of the CLEA software v1.04 and replaced those generated in 2006 using the original version of the model CLEA UK *beta*. In 2015 S4ULs were published by LQM/CIEH (Nathanail *et al*, 2015) to replace the second edition GACs. Table 2 summarises the S4ULs which are reproduced with permission; Publication Number S4UL3202.

Soil Guideline Values (SGVs) and Generic Assessment Criteria (GAC)

In 2009, Soil Guideline Values (SGVs) were published by the Environment Agency for arsenic, cadmium, mercury, nickel, selenium, benzene, toluene, ethyl benzene, xylenes, phenol and dioxins, furans and dioxin-like PCBs. These were derived using the CLEA model for residential, allotments and commercial land-uses.

These SGVs have now largely been superseded by the C4SLs and the S4ULs, with the exception of the SGVs for dioxins, furans and dioxin-like PCBs which are shown in Table 3.

In January 2010, Generic Assessment Criteria (GAC) derived using CLEA were published by CL:AIRE for 35 substances. These GAC are listed in Table 4.

Note that the SGVs for dioxins, furans and dioxin like PCBs and CL:AIRE GAC were derived using an older version of CLEA (v1.06) than used to derive the S4UL and C4SL (v1.07). This older version used slightly more conservative values for some exposure parameters and therefore the derived SGVs/GAC are still considered suitably precautionary for use as screening criteria.

Note on Mercury, Chromium and Arsenic

The analytical testing routinely undertaken by Stantec determines total concentration, however, the toxicity depends on the form of the contaminant.

If a source of Mercury, Chromium or Arsenic is identified or the total concentration exceeds the relevant worst case speciated criteria it will be desirable/necessary to undertake additional speciated testing and further assessment.

Note on Polycyclic Aromatic Hydrocarbons

Polycyclic Aromatic Hydrocarbons (PAHs) are a family of hundreds of different congeners whose chemical structures contain two or more fused aromatic rings. Whilst it is recognised that there is an ongoing debate on the most appropriate method to assess health effects of PAH mixtures, in 2010 the Health Protection Agency recommended the use of benzo[a]pyrene (BaP) as a surrogate marker approach in the assessment of carcinogenic risks posed by PAHs in soils (HPA, 2010).

In most cases, BaP is chosen as the surrogate marker (SM) due to its ubiquitous nature and the vast amount of data available and has been used by various authoritative bodies to assess the carcinogenic risk of PAHs in food. The SM approach estimates the carcinogenic toxicity of a mixture of PAHs in an environmental matrix by using toxicity data for a PAH mixture for which the composition is known.

Exposure to the SM is assumed to represent exposure to all PAHs in that matrix therefore the toxicity of the SM represents the toxicity of the mixture. The SM approach relies on a number of assumptions (HPA, 2010).

- The SM (BaP) must be present in all the samples.
- The profile of the different PAH relative to BaP should be similar in all samples.
- The PAH profile in the soil samples should be sufficiently similar to that used in the pivotal toxicity study on which HBGV was based i.e. the Culp study (Culp *et al*. (1998)).

In order to justify the use of a surrogate marker assessment criterion (C4SL for benzo(a)pyrene and S4UL coal tar) the LQM PAH Profiling Tool is used by Stantec to assess the similarity of the PAH profile in a soil sample to that of the toxicity study. The spreadsheet calculates the relative proportions of the genotoxic PAHs and plots them relative to the composition of the two coal mixtures used by Culp *et al*. Provided that the relative proportions are within an order of magnitude of those from the Culp Study (as suggested by HPA) Stantec will use the C4SL for benzo(a)pyrene as a surrogate marker for the carcinogenic PAHs, i.e. benzo(a)pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(ah)anthracene, indeno(123-cd)pyrene and benzo(ghi)perylene. For projects where this approach is appropriate the results will be assessed using the Coal Tar criterion (BAP C4SL) and the criteria for non-carcinogenic PAHs (S4ULs), i.e. naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene and pyrene.

Note on Total Petroleum Hydrocarbons

The S4UL for Total Petroleum Hydrocarbon (TPH) fractions are based on 'threshold' health effects. In accordance with Environment Agency guidance (EA, 2005) and the S4UL report (Nathanail *et al*, 2015) the potential for additivity of toxicological effects between fractions should be considered. Practically, to address this issue the hazard quotient (HQ) for each fraction should be calculated by dividing the measured concentration of the fraction by the GAC. The HQs are then added to form a hazard index (HI) for that sample. An HI greater than 1 indicates an exceedance.

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

Note on Dioxins, Furans and Dioxin-like PCBs

The SGVs for dioxins, furans and dioxin-like PCBs are based on an assumed congener profile for urban soils. The total measured concentration of dioxin, furan and dioxin-like PCB congeners listed in the SGV report (EA, 2009a) should be compared with the SGVs to make an initial assessment of risk. A more accurate assessment can be made using the Environment Agency's site specific worksheet for dioxins, furans and dioxin like PCBs available from [REDACTED]

Note on Asbestos

Asbestos in soil and made ground is currently under review by a number of bodies. There are no current published guidance values for asbestos in soil other than the waste classification values given in the EA's Technical Guidance WM3, Hazardous Waste – Interpretation of the definition and classification of hazard waste (EA, 2015). This guidance is only appropriate for soils that are being discarded as waste.

Testing for asbestos will be carried out on selected samples of made ground encountered during investigation, initially samples will be subjected to an asbestos screen and, if asbestos is found to be present, subjected to quantification depending on the project specific requirements. The reader is directed to the report text for guidance on the approach adopted in respect to any asbestos found to be present.

Further guidance is also available in publication C733, Asbestos in soil and made ground: a guide to understanding and managing risks (CIRIA 2014).

Note on Soil Saturation Concentration

The soil saturation concentration is the concentration of an organic constituent in soil at which either the pore water or soil vapour has theoretically become saturated with the substance, i.e. the substance concentration has reached its maximum aqueous solubility or vapour pressure. The soil saturation concentration is related to the properties of the substance as well as the properties of the soil (including soil organic matter content).

The soil saturation concentrations are shown in Table 2 in brackets where exceeded by the assessment criteria and in Table 4 for all substances. Measured concentrations in excess of the soil saturation concentration have various potential implications as discussed below.

Firstly, where measured concentrations exceed the soil saturation concentration, the risk from vapour inhalation and/or consumption of produce may be limited. The CLEA model calculates the soil

saturation concentration but it does not limit exposure where this concentration is exceeded. This adds an additional level of conservatism for CLEA derived assessment criteria where these exceed the calculated soil saturation concentration. Secondly, the soil saturation concentration is sometimes used to flag the potential presence of non-aqueous phase liquid (NAPL, a.k.a. free phase) in soil. The presence of NAPL is an important consideration in the Tier 2 assessment because, where present, the risks from NAPL may need to be considered separately. Theoretically, where a measured concentration exceeds the soil saturation concentration NAPL could be present. However, using theoretical saturation values is not always reliable for the following reasons: The soil saturation concentration is based on the aqueous solubility and vapour pressure of a pure substance and not a mixture, of which NAPLs are often comprised; and

The soil saturation concentration does not account for the sorption capacity of the soil. As a result, exceedance of the soil saturation concentration does not necessarily imply that NAPL is present. This is particularly the case for longer chain hydrocarbons such as PAHs which have low solubility and vapour pressure and hence a low soil saturation concentration but that are strongly sorbed to soil.

The measured concentrations will be compared to the soil saturation concentrations shown in Tables 2 and 4. Where exceeded Stantec will use additional lines of evidence (such as visual evidence and concentration of total TPH) to determine whether or not NAPL is likely to be present. If the presence of NAPL is deemed plausible the implications will be considered in the risk assessment.

3.2 Potential Harm to the Built Environment

Land contamination can pose risks to buildings, building materials and services (BBM&S) in a number of ways. Volatile contaminants and gases can accumulate and cause explosion or fire. Foundations and buried services can be damaged by corrosive substances and contaminants such as steel slags can create unstable ground conditions through expansion causing structural damage.

Stantec use the following primary guidance to assess the significance of soil chemistry with respect to its potential to harm the built environment.

- i) Approved Document C - Site Preparation and Resistance to Contaminants and Moisture. (DCLG, 2013);
- ii) Concrete in aggressive ground SD1 (BRE 2005);
- iii) Guidance for the selection of water supply pipes to be used in brownfield sites (UK WIR 2011);

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

- iv) Protocols published by agreement between Water UK and the Home Builders Federation providing supplementary guidance which includes the Risk Assessment for Water Pipes (the 'RA') (Water UK 2014).
- v) Performance of Building Materials in Contaminated Land report BR255 (BRE 1994).
- vi) Risks of Contaminated Land to Buildings, Building Materials and Services. A Literature Review - Technical Report P331 (EA, 2000).
- vii) Guidance on assessing and managing risks to buildings from land contamination - Technical Report P5 035/TR/01 (EA, 2001).

3.3 Potential to Harm Ecosystems, Animals, Crops etc

The criteria routinely used by Stantec as Tier 2 screening values to assess the potential of soil chemistry to harm ecosystems are taken from the following guidance and are summarised in Table 5.

- i) Derivation and Use of Soil Screening Values for assessing ecological risks (EA, 2017a);
- ii) The Restoration and Aftercare of Metalliferous Mining Sites for Pasture and Grazing (ICRCL 70/90, 1990);
- iii) Sewage sludge on farmland: code of practice for England, Wales and Northern Ireland (DEFRA, 2018); and
- iv) BS 3882:2015 Specification for topsoil and requirements for use (BSI, 2015).

Unless stated in the report the assessment is solely for phytotoxic parameters and additional assessment is required to determine suitability as a growing medium.

4 CRITERIA FOR EVALUATING LIQUID RESULTS

4.1 Potential Harm to Human Health via Ingestion

The Tier 2 water screening values routinely adopted by Stantec for assessing the potential for harm to human health via ingestion (presented as Table 6) are taken from The Water Supply (Water Quality) Regulations (S.I. 2018/647) unless otherwise indicated.

It should be noted that some of the prescribed concentrations listed in the Water Supply Regulations have been set for reasons other than their potential to cause harm to human health. The concentrations of iron and manganese are controlled because they may taint potable water with an undesirable taste, odour or colour or may potentially deposit precipitates in water supply pipes.

4.2 Potential Harm to Human Health via Inhalation of Vapours

The Tier 2 water screening values adopted by Stantec for assessing the potential for chronic human health risk from the inhalation of vapours from volatile contaminants in groundwater are presented in Table 7. These generic assessment criteria have been taken from a report published by the Society of Brownfield Risk Assessment (SoBRA) (SoBRA, 2017). The methodology adopted in their generation is considered compatible with the UK approach to deriving GAC and adopts a precautionary approach. As with all published GAC the suitability for use on the site being assessed has to be decided by the assessor based on a thorough understanding of the methodology and assumptions used in their derivation. Note, that the SoBRA groundwater vapour GAC are not intended for assessing risks to ground workers from short-term exposure.

Note that Table 7 shows the theoretical maximum aqueous solubility for each contaminant and indicates the GAC that exceed solubility. Measured concentrations in excess of solubility may be an indication that NAPL is present. As for the assessment of soils, if the presence of NAPL is deemed plausible the implications will be considered in the risk assessment.

4.3 Potential to Harm Controlled Waters

When assessing ground condition data and the potential to harm Controlled Waters Stantec uses the approach presented in the groundwater protection position statements published 14.03.17 (EA, 2017b) which describe the Environment Agency's approach to managing and protecting groundwater. They update and replace Groundwater Protection: principles and practice (GP3). Controlled Waters are rivers, estuaries, coastal waters, lakes and groundwaters. Water in the unsaturated zone is not groundwater but does come within the scope of the term "ground waters" as used and defined in the Water Resources Act 1991. It will continue to be a technical decision for the Environment Agency to determine what is groundwater in certain circumstances for the purposes of the Regulations. As discussed in our Methodology for Assessment of Land Contamination perched water is not considered a receptor in Stantec assessments.

The EU Water Framework Directive (WFD) 2000/60/EC provides for the protection of sub-surface, surface, coastal and territorial waters through a framework of river basin management.

The EU Updated Water Framework Standards Directive 2014/101/EU amended the EU WFD to update the international standards therein; it entered into force on 20 November 2014 with the requirement for its provisions to be transposed in Member State law by 20 May 2016.

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

Member States are required under the EU WFD to update their river basin management plans every six years. The first river basin management plans for England and Wales, Scotland and Northern Ireland were published in December 2009, and these were updated in 2015.

Other EU Directives in the European water management framework include:

- the EU Priority Substances Directive 2013/39/EU;
- EU Groundwater Pollutants Threshold Values Directive 2014/80/EU amending the EU Groundwater Daughter Directive (GWDD) 2006/118/EC; and
- the EU Biological Monitoring Directive 2014/101/EU.

The Priority Substances Directive set environmental quality standards (EQS) for the substances in surface waters (river, lake, transitional and coastal) and confirmed their designation as priority or priority hazardous substances (PS), the latter being a subset of particular concern. Environmental Quality Standards for PS are determined at the European level and apply to all Member States. Member States identify and develop standards for 'Specific Pollutants'. Specific Pollutants (SP) are defined as substances that can have a harmful effect on biological quality.

The Water Framework Directive (Standards and Classification) Directions (England and Wales) (DEFRA, 2015) were issued to the Environment Agency as an associated document of the Water Environment (WFD) (England and Wales) Regulations 2015 (S.I. 2015/1623) and provide directions for the classification of surface water and groundwater bodies. Schedule 3 parts 2 and 3 relate to surface water standards for specific pollutants in fresh or salt water bodies and priority substances in inland (rivers, lakes and related modified/artificial bodies) or other surface waters respectively. Although Schedule 5 presents threshold values for groundwater the Direction specifically excludes their use as part of site-specific investigations.

Table 6 presents the criteria routinely used by Stantec as Tier 2 screening values. This table only presents a selection of the more commonly analysed parameters and the source documents should be consulted for other chemicals. For screening groundwater the criteria selected are the standards for surface water and/or human consumption as appropriate together with the following:-

For a **hazardous substance** Stantec adopts the approach that, if the concentration in a discharge to groundwater is less than the Minimum Reporting Value (MRV), the input is regarded as automatically meeting the Article 2 (b) 'de-minimus' requirement of exemption 6 (3) (b) of the GWDD. Stantec has

selected hazardous substances from the latest list published by the Joint Agencies Groundwater Directive Advisory Group (JAGDAG, 2018). MRV is the lowest concentration of a substance that can be routinely determined with a known degree of confidence, and may not be equivalent to limit of detection. MRVs have been identified from DEFRA's guidance on Hazardous Substances to Groundwater: Minimum Reporting Values (DEFRA, 2017), and are shown in Table 6.

Note that for land contamination assessments, where hazardous substances have already entered groundwater, remediation targets would typically be based on achieving appropriate water quality standards (e.g. drinking water standard or EQS) at a compliance point rather than an MRV. For this reason, when assessing measured groundwater or soil leachate concentrations, the values for human consumption, fresh water and salt water shown in Table 6 (whichever is appropriate for the context of the site) will be used as the Tier 2 assessment criteria rather than MRV. For hazardous substances with no water quality standard the laboratory method detection limit will be used as the assessment criteria.

For **non-hazardous substances** the GWDD requires that inputs be limited to avoid deterioration. UKTAG guidance equates deterioration with pollution. Non-hazardous substances are all substances not classified as hazardous. For Stantec assessments the values for human consumption, fresh water and salt water shown in Table 6 (whichever is appropriate for the context of the site) are used as the assessment criteria for non-hazardous substances.

Note on Copper, Lead, Manganese, Nickel and Zinc

EQS_{bioavailable} have been developed for UK Specific Pollutants copper, zinc and manganese and the EU priority substances lead and nickel. An EQS is the concentration of a chemical in the environment below which there is not expected to be an adverse effect on the specific endpoint being considered, e.g. the protection of aquatic life.

It is very difficult to measure the bioavailable concentration of a metal directly. The UK has developed simplified Metal Bioavailability Assessment Tool (M-BAT) for copper, zinc, nickel and manganese which uses local water chemistry data, specifically pH, dissolved organic carbon (DOC) (mg/L) and Calcium (Ca) (mg/L).

Where the recorded total dissolved concentration exceeds the screening criteria for these parameters (EQS_{bioavailable}) further assessment will be undertaken using the tools downloaded from



The models calculate a risk characterisation ratio

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

(RCR) and where this is greater than 1 this indicates the bioavailable concentration is above the EQS and the parameter is then identified as a potential hazard. The report will discuss this identified hazard noting that the pH, calcium and, in particular, the dissolved organic carbon (DOC) in groundwater may be quite different to the receiving water (e.g. due to the presence to leaf litter or organic sediments dissolving in the water).

5 CRITERIA FOR EVALUATING GAS RESULTS

Stantec use the following primary guidance on gas monitoring methods and investigation, the assessment of risk posed by soil gases (including Volatile Organic Compounds (VOCs)) and mitigation measures/risk reduction during site development.

- i) BS 8576:2013 – Guidance on Ground Gas Investigations: Permanent gases and Volatile Organic Compounds (VOCs) (BSI, 2013);
- ii) TB18 Continuous Ground-Gas Monitoring and the Lines of Evidence Approach to Risk Assessment CL:AIRE Technical Bulletin TB18 (CL:AIRE 2019)
- iii) RB17 A pragmatic approach to Ground Gas Risk Assessment. CL:AIRE Research Bulletin RB17 (Card et al, 2012);
- iv) The VOCs Handbook. C682 (CIRIA, 2009).
- v) Assessing risks posed by hazardous gases to buildings C665 (CIRIA, 2007);
- vi) Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present. (NHBC, 2007); and
- vii) BS 8485:2015+A1:2019- Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings (BSI, 2019).

Gas and borehole flow data are used to obtain the gas screening value (GSV) for methane and carbon dioxide. The GSV is used to establish the characteristic situation and to make recommendations for gas protection measures for buildings if required.

Radon

Stantec use the following primary guidance to assess the significance of the radon content of soil gas.

- i) Radon: guidance on protective measures for new dwellings. Report BR211 (BRE, 2015); and
- ii) Indicative Atlas of Radon in England and Wales (HPA & BGS, 2007).

6 REFERENCES

- BRE (1994) Performance of Building Materials in Contaminated Land (BR255) Building Research Establishment (BRE).
- BRE (2005) Concrete in aggressive ground. Special Digest 1, Building Research Establishment (BRE), Garston, Herts.
- BRE (2015) BR211-2015 : Radon: Guidance on protective measures for new buildings (2015 edition) Building Research Establishment (BRE), Garston, Herts.
- BSI (2011) BS10175:2011 +A1:2013 Investigation of contaminated sites – code of practice. British Standards Institute, London.
- BSI (2013) BS 8576:2013 – Guidance on Ground Gas Investigations : Permanent gases and Volatile Organic Compounds (VOCs). British Standards Institute, London.
- BSI (2015) BS 3882:2015 - Specification for topsoil
- BSI (2019) BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. British Standards Institute, London.
- Card G, Wilson S, Mortimer S. (2012). A Pragmatic Approach to Ground Gas Risk Assessment. CL:AIRE Research Bulletin RB17. CL:AIRE, London, UK. ISSN 2047- 6450 (Online)
- CL:AIRE (2019) TB18 Continuous Ground-Gas Monitoring and the Lines of Evidence Approach to Risk Assessment CL:AIRE Technical Bulletin TB18
- CIRIA (2007) C665 Assessing risks posed by hazardous gases to buildings. Construction Industry Research and Information Association (CIRIA), London.
- CIRIA (2009) C682 The VOCs Handbook. C682 Construction Industry Research and Information Association (CIRIA), London.
- CIRIA (2014) C733, Asbestos in soil and made ground: a guide to understanding and managing risks. Construction Industry Research and Information Association (CIRIA), London.
- CL:AIRE (2010) Soil Generic Assessment Criteria for Human Health Risk Assessment. Published in January 2010 by Contaminated Land: Applications in Real Environments, London. ISBN 978-1-905046-20-1.
- CL:AIRE (2014) SP1010 – Development of Category 4 Screening Levels for Assessment of

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

- Land Affected by Contamination. Final Project Report published by Contaminated Land: Applications in Real Environments (CL:AIRE) 24th September 2014
- CL:AIRE (2021) Web page on Category 4 Screening Levels and the Phase 2 project [REDACTED]
- Culp, S.J, Gaylor, D.W., Sheldon, W.G., Goldstein, L.W. and Beland, F.A. (1998) A comparison of the tumors induced by coal tar and benzo(a)pyrene in a 2-year bioassay. Carcinogenesis, 19, pp 117-124.
- DCLG (2013) Approved Document C - Site preparation and resistance to contaminants and moisture (2004 Edition incorporating 2010 and 2013 amendments).
- DEFRA (2012) Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance. Department for Environment, Food and Rural Affairs (DEFRA).
- DEFRA (2014) SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document. Department for Environment, Food and Rural Affairs December 2014
- DEFRA (2015) The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.
- DEFRA (2017) Hazardous substances to groundwater: minimum reporting values. Updated 13 January 2017 <https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values>
- DEFRA (2018) Sewage sludge in agriculture: code of practice for England, Wales and Northern Ireland <https://www.gov.uk/government/publications/sewage-sludge-in-agriculture-code-of-practice/sewage-sludge-in-agriculture-code-of-practice-for-england-wales-and-northern-ireland>
- EA (2000) Risks of Contaminated Land to Buildings, Building Materials and Services. A Literature Review - Technical Report P331
- EA (2001) Guidance on assessing and managing risks to buildings from land contamination - Technical Report P5 035/TR/01
- EA (2006) CLEA update No. 4. Environment Agency, Bristol.
- EA (2008) Ecological Risk Assessment (ERA).
- Science Report Series SC070009, Environment Agency, Bristol.
- EA (2009a) Soil Guideline Values for contaminants in soil. Science Reports SC050021/various.
- EA (2009b) Using Soil Guideline Values. Science Report SC050021/SGV Introduction. Environment Agency, Bristol.
- EA (2009c) Updated Technical Background to the CLEA model. Science Report SC050021/SR3 Introduction. Environment Agency, Bristol.
- EA (2009d) Human health toxicological assessment of contaminants in soil. Science Report SC050021/SR2. Environment Agency, Bristol.
- EA (2009e) Compilation data for priority organic contaminants for derivation of soil guideline values Science Report SC50021/SR7
- EA (2009f) CLEA Software (Version 1.05) Handbook Science Report SC050021/SR4
- EA (2015) Guidance on the classification and assessment of waste (3rd edition 2015) - Technical Guidance WM3
- EA (2017a) Derivation and use of soil screening values for assessing ecological risks. Report – ShARE id26
- EA (2017b) Groundwater Protection Position Statements - <https://www.gov.uk/government/publications/groundwater-protection-position-statements>
- HPA (2010) Risk assessment approaches for polycyclic aromatic hydrocarbons. HPA contaminated land information sheet. Health Protection Agency (HPA)
- HPA & BGS (2007). Indicative Atlas of Radon in England and Wales. HPA-RPD-033. Health Protection Agency and British Geological Survey
- ICRCL (1990) The Restoration and Aftercare of Metalliferous Mining Sites for Pasture and Grazing 70/90. Interdepartmental Committee on the Redevelopment of Contaminated Land, London.
- JAGDAG (2018). Substances confirmed as hazardous or non-hazardous pollutants following public consultation. Last updated 31 January 2018. Joint Agencies Groundwater Directive Advisory Group [REDACTED]
- Nathanail, C.P., McCaffrey, C., Gillett, A.G., Ogden, R.C. and Nathanail, J.F. (2015) The LQM/CIEH

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

S4ULs for Human Health Risk Assessment.
Land Quality Press, Nottingham.

NHBC (2007) Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present.
National House Building Council.

S.I. (2018/647). Statutory Instrument 2018 No 614
The Water Supply (Water Quality) Regulations, 2016.

S.I. (2017/407). Statutory Instrument 2017 No 407
Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

S.I. (2015/1623). Statutory Instrument 2015 No 1623
The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015.

SoBRA (2017) Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater Version 1.0
February 2017. Society of Brownfield Risk Assessment (SoBRA)

UKWIR (2011) Guidance for the selection of Water Pipes to be used in Brownfield Sites. UK Water Industry Research (UKWIR)

Water UK (2014) Contaminated Land Assessment Guidance

Stantec/UK/I&B: Evaluation Criteria for Generic Quantitative Risk Assessment (England)

Table 1: Category 4 Screening Levels (C4SL)

	Allotments	Residential (with home-grown produce)	Residential (without home-grown produce)	Commercial	Public Open Space 1	Public Open Space 2
Arsenic	49	37	40	640	79	170
Benzene						
- 1% SOM*	0.039	0.20	0.89	27	140	190
- 2.5% SOM*	0.081	0.41	1.6	50	140	210
- 6% SOM	0.18	0.87	3.3	98	140	230
Benzo(a)pyrene (as a surrogate marker for carcinogenic PAHs)	5.7	5.0	5.3	77	10	21
Cadmium	3.9	22	150	410	220	880
Chromium VI	170	21	21	49	21	250
Lead	80	200	310	2300	630	1300
Vinyl Chloride/ Chloroethene/ Chloroethylene, (CAS No. 75-01-4)	0.0017 0.0031 0.0058	0.0064 0.010 0.017	0.015 0.019 0.029	1.1 1.4 2.2	7.8 7.8 7.8	18 19 19
Trichloroethene / Trichloroethylene/ TCE or 'Trike' (CAS No. 79-01-06)	0.032 0.072 0.16	0.0093 0.020 0.043	0.0097 0.020 0.045	0.73 1.5 3.4	76 78 79	41 54 69
Tetrachloroethene/ Tetrachloroethylene/ Perchloroethylene, PCE or 'perc', (CAS No. 127-18-4)	2.0 4.8 11.0	0.31 0.70 1.60	0.32 0.71 1.60	24 55 130	3,200 3,300 3,400	1,400 1,900 2,500

Units mg/kg dry weight

Values taken from SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document (Department for Environment, Food and Rural Affairs December 2014), unless stated otherwise
Public Open Space 1 – for grassed area adjacent to residential housing
Public Open Space 2 – Park Type Public Open Space Scenario
Based on a sandy loam as defined in SR3 (Environment Agency, 2009b)
Note that, with the exception of benzene, these C4SL are not SOM dependent
* - Stantec derived C4SL using CLEA v1.071

Table 2: Suitable 4 Use Levels (S4UL)

Determinand	Allotment	R _{WH} HP	R _{WO} HP	Commercial/ Industrial	POSresi	POSpark
Metals						
Arsenic (Inorganic) ^{a, b, c}	43	37	40	640	79	170
Beryllium ^{a, b, d, e}	35	1.7	1.7	12	2.2	63
Boron ^{a, b, d}	45	290	11000	240000	21000	46000
Cadmium (pH6-8) ^{a, b, d, f}	1.9	11	85	190	120	560
Chromium (trivalent) ^{a, b, d, g}	18000	910	910	8600	1500	33000
Chromium (hexavalent) ^{a, b, c}	1.8 ^h	6 ⁱ	6 ⁱ	33 ^j	7.7 ^j	220 ^j
Copper ^{a, b, c}	520	2400	7100	68000	12000	44000
Mercury (elemental) ^{a, b, c, j}	21	1.2	1.2	58 ^{vap} (25.8)	16	30 ^{vap} (25.8)
Mercury (inorganic) ^{a, b, c}	19	40	56	1100	120	240
Methylmercury ^{a, b, c}	6	11	15	320	40	68
Nickel ^{a, b, c}	53 ^k	130 ^e	180 ^e	980 ^e	230 ^e	800 ^k
Selenium ^{a, b, c}	88	250	430	12000	1100	1800
Vanadium ^{a, b, c, i, j}	91	410	1200	9000	2000	5000
Zinc ^{a, b, c}	620	3700	40000	730000	81000	170000
BTEX Compounds (SOM 1%/ 2.5%/ 6%)						
Benzene ^{a, b, l, m}	0.017/0.034/ 0.075	0.087/0.17/ 0.37	0.38/0.7/1.4	27 / 47 / 90	72 / 72 / 73	90 / 100 / 110
Toluene ^{a, b, l, m}	22 / 51 / 120	130 / 290 / 660	880 ^{vap} (869) / 1900/3900	56000 ^{vap} (869) / 110000 ^{vap} (1920) / 180000 ^{vap} (4360)	56000 / 56000 / 56000	87000 ^{vap} (869) / 95000 ^{vap} (1920) / 100000 ^{vap} (4360)
Ethylbenzene ^{a, b, l, m}	16 / 39 / 91	47 / 110 / 260	83 / 190 / 440	5700 ^{vap} (518) / 13000 ^{vap} (1220) / 27000 ^{vap} (2840)	24000 / 24000 / 25000	17000 ^{vap} (518) / 22000 ^{vap} (1220) / 27000 ^{vap} (2840)
O – Xylene ^{a, b, l, m, n}	28 / 67 / 160	60 / 140 / 330	88 / 210 / 480	6600 ^{sol} (478) / 15000 ^{sol} (1120) / 33000 ^{sol} (2620)	41000 / 42000 / 43000	17000 ^{sol} (478) / 24000 ^{sol} (1120) / 33000 ^{sol} (2620)
M – Xylene ^{a, b, l, m, n}	31 / 74 / 170	59 / 140 / 320	82 / 190 / 450	6200 ^{vap} (625) / 14000 ^{vap} (1470) / 31000 ^{vap} (3460)	41000 / 42000 / 43000	17000 ^{vap} (625) / 24000 ^{vap} (1470) / 32000 ^{vap} (3460)
P – Xylene ^{a, b, l, m, n}	29 / 69 / 160	56 / 130 / 310	79 / 180 / 430	5900 ^{sol} (576) / 14000 ^{sol} (1350) / 30000 ^{sol} (3170)	41000 / 42000 / 43000	17000 ^{sol} (576) / 23000 ^{sol} (1350) / 31000 ^{sol} (3170)

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

Determinand	Allotment	R _{WH} HP	R _{WO} HP	Commercial/ Industrial	POSresi	POSpark
Total xylenes ^t	28 / 67 / 160	56 / 130 / 310	79 / 180 / 430	5900 ^{sol} (576) / 14000 ^{sol} (1350) / 30000 ^{sol} (3170)	41000 / 42000 / 43000	17000 ^{sol} (576) / 23000 ^{sol} (1350) / 31000 ^{sol} (3170)
Polycyclic Aromatic Hydrocarbons (SOM 1%/ 2.5%/ 6%) a, b, i, p						
Acenaphthene	34 / 85 / 200	210 / 510 / 1100	3000 ^{sol} (57.0) / 4700 ^{sol} (141) / 6000 ^{sol} (336)	84000 ^{sol} (57.0) / 97000 ^{sol} (141) / 100000	15000 / 15000 / 15000	29000 / 30000 / 30000
Acenaphthylene	28 / 69 / 160	170 / 420 / 920	2900 ^{sol} (86.1) / 4600 ^{sol} (212) / 6000 ^{sol} (506)	83000 ^{sol} (86.1) / 97000 ^{sol} (212) / 100000	15000 / 15000 / 15000	29000 / 30000 / 30000
Anthracene	380 / 950 / 2200	2400 / 5400 / 11000	31000 ^{sol} (1.17) /35000/ 37000	520000 / 540000 / 540000	74000 / 74000 / 74000	150000 / 150000 / 150000
Benzo(a)anthracene	2.9 / 6.5 / 13	7.2 / 11 / 13	11 / 14 / 15	170 / 170 / 180	29 / 29 / 29	49 / 56 / 62
Benzo(a)pyrene (Bap) ^u	0.97 / 2.0 / 3.5	2.2 / 2.7 / 3.0	3.2 / 3.2 / 3.2	35 / 35 / 36	5.7 / 5.7 / 5.7	11 / 12 / 13
Benzo(b)fluoranthene	0.99 / 2.1 / 3.9	2.6 / 3.3 / 3.7	3.9 / 4.0 / 4.0	44 / 44 / 45	7.1 / 7.2 / 7.2	13 / 15 / 16
Benzo(g,h,i)perylene	290 / 470 / 640	320 / 340 / 350	360 / 360 / 360	3900 / 4000 / 4000	640 / 640 / 640	1400 / 1500 / 1600
Benzo(k)fluoranthene	37 / 75 / 130	77 / 93 / 100	110 / 110 / 110	1200 / 1200 / 1200	190 / 190 / 190	370 / 410 / 440
Chrysene	4.1 / 9.4 / 19	15 / 22 / 27	30 / 31 / 32	350 / 350 / 350	57 / 57 / 57	93 / 110 / 120
Dibenzo(ah)anthracene	0.14 / 0.27 / 0.43	0.24 / 0.28 / 0.3	0.31 / 0.32 / 0.32	3.5 / 3.6 / 3.6	0.57 / 0.57 / 0.58	1.1 / 1.3 / 1.4
Fluoranthene	52 / 130 / 290	280 / 560 / 890	1500 / 1600 / 1600	23000 / 23000 / 23000	3100 / 3100 / 3100	6300 / 6300 / 6400
Fluorene	27 / 67 / 160	170 / 400 / 860	2800 ^{sol} (30.9) / /3800 ^{sol} (76.5) / /4500 ^{sol} (183)	63000 ^{sol} (30.9) / 68000 / 71000	9900 / 9900 / 9900	20000 / 20000 / 20000
Indeno(1,2,3-cd)pyrene	9.5 / 21 / 39	27 / 36 / 41	45 / 46 / 46	500 / 510 / 510	82 / 82 / 82	150 / 170 / 180
Naphthalene ^q	4.1 / 10 / 24	2.3 / 5.6 / 13	2.3 / 5.6 / 13	190 ^{sol} (76.4) / 460 ^{sol} (183) / 1100 ^{sol} (432)	4900 / 4900 / 4900	1200 ^{sol} (76.4) / 1900 ^{sol} (183) / 3000
Phenanthrene	15 / 38 / 90	95 / 220 / 440	1300 ^{sol} (36.0) / / 1500 / 1500	22000 / 22000 / 23000	3100 / 3100 / 3100	6200 / 6200 / 6300
Pyrene	110 / 270 / 620	620 / 1200 / 2000	3700 / 3800 / 3800	54000 / 54000 / 54000	7400 / 7400 / 7400	15000 / 15000 / 15000
Coal Tar (Bap as surrogate marker) ^u	0.32 / 0.67 / 1.2	0.79 / 0.98 / 1.1	1.2 / 1.2 / 1.2	15 / 15 / 15	2.2 / 2.2 / 2.2	4.4 / 4.7 / 4.8
Explosives a, b, i, p						
2, 4, 6 Trinitrotoluene	0.24 / 0.58 / 1.40	1.6 / 3.7 / 8.0	65 / 66 / 66	1000 / 1000 / 1000	130 / 130 / 130	260 / 270 / 270
RDX (Royal Demolition Explosive C ₃ H ₆ N ₆ O ₆)	17 / 38 / 85	120 / 250 / 540	13000 / 13000 / 13000	210000 / 210000 / 210000	26000 / 26000 / 27000	49000 ^{sol} (18.7) / 51000 / 53000
HMX (High Melting Explosive C ₄ H ₈ N ₈ O ₈)	0.86 / 1.9 / 3.9	5.7 / 13 / 26	6700 / 6700 / 6700	110000 / 110000 / 110000	13000 / 13000 / 13000	23000 ^{vap} (0.35) / /23000 ^{vap} (0.39) / /24000 ^{vap} (0.48)
Petroleum Hydrocarbons (SOM 1%/ 2.5%/ 6%) a, b, i, m						
Aliphatic EC 5-6	730 / 1700 / 3900	42 / 78 / 160	42 / 78 / 160	3200 ^{sol} (304) / 5900 ^{sol} (558) / 12000 ^{sol} (1150)	570000 ^{sol} (304) 590000 / 600000	95000 ^{sol} (304) / 130000 ^{sol} (558) / 180000 ^{sol} (1150)
Aliphatic EC >6-8	2300 / 5600 / 13000	100 / 230 / 530	100 / 230 / 530	7800 ^{sol} (144) / 17000 ^{sol} (322) / 40000 ^{sol} (736)	600000 / 610000 / 620000	150000 ^{sol} (144) 220000 ^{sol} (322) / 320000 ^{sol} (736)
Aliphatic EC >8-10	320 / 770 / 1700	27 / 65 / 150	27 / 65 / 150	2000 ^{sol} (78) / 4800 ^{vap} (190) / 11000 ^{vap} (451)	13000 / 13000 / 13000	14000 ^{sol} (78) / 18000 ^{vap} (190) / 21000 ^{vap} (451)
Aliphatic EC >10-12	2200 / 4400 / 7300	130 ^{vap} (48) / 330 ^{vap} (118) / 760 ^{vap} (283)	130 ^{vap} (48) / 330 ^{vap} (118) / 770 ^{vap} (283)	9700 ^{sol} (48) / 23000 ^{vap} (118) / 47000 ^{vap} (283)	13000 / 13000 / 13000	21000 ^{sol} (48) / 23000 ^{vap} (118) / 24000 ^{vap} (283)
Aliphatic EC >12-16	11000 / 13000 / 13000	1100 ^{sol} (24) / 2400 ^{sol} (59) / 4300 ^{sol} (142)	1100 ^{sol} (24) / 2400 ^{sol} (59) / 4400 ^{sol} (142)	59000 ^{sol} (24) / 82000 ^{sol} (59) / 90000 ^{sol} (142)	13000 / 13000 / 13000	25000 ^{sol} (24) / 25000 ^{sol} (59) / 26000 ^{sol} (142)
Aliphatic EC >16-35 °	260000 / 270000 / 270000	65000 ^{sol} (8.48 92000 ^{sol} (21) 110000	65000 ^{sol} (8.48 92000 ^{sol} (21) 110000	1600000 / 1700000 / 1800000	250000 / 250000 / 250000	450000 / 480000 / 490000
Aliphatic EC >35-44 °	260000 / 270000 / 270000	65000 ^{sol} (8.48 92000 ^{sol} (21) / 110000	65000 ^{sol} (8.48 92000 ^{sol} (21) 110000	1600000 / 1700000 / 1800000	250000 / 250000 / 250000	450000 / 480000 / 490000
Aromatic EC 5-7 (benzene)	13 / 27 / 57	70 / 140 / 300	370 / 690 / 1400	26000 ^{sol} (1220) / 46000 ^{sol} (2260) / 86000 ^{sol} (4710)	56000 / 56000 / 56000	76000 ^{sol} (1220) /84000 ^{sol} (2260) / 92000 ^{sol} (4710)
Aromatic EC >7-8 (toluene)	22 / 51 / 120	130 / 290 / 660	860 / 1800 / 3900	56000 ^{vap} (869) / 110000 ^{sol} (1920) / 180000 ^{vap} (4360)	56000 / 56000 / 56000	87000 ^{vap} (869) / 95000 ^{sol} (1920) / 100000 ^{vap} (4360)
Aromatic EC >8-10	8.6 / 21 / 51	34 / 83 / 190	47 / 110 / 270	3500 ^{vap} (613) / 8100 ^{vap} (1500) / 17000 ^{vap} (3580)	5000 / 5000 / 5000	7200 ^{vap} (613) / 8500 ^{vap} (1500) / 9300 ^{vap} (3580)

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

Determinand	Allotment	R _W HP	R _W HP	Commercial/ Industrial	POSresi	POSpark
Aromatic EC >10-12	13 / 31 / 74	74 / 180 / 380	250 / 590 / 1200	16000 ^{sol} (364) / 28000 ^{sol} (899) / 34000 ^{sol} (2150)	5000 / 5000 / 5000	9200 ^{sol} (364) / 9700 ^{sol} (899) / 10000
Aromatic EC >12-16	23 / 57 / 130	140 / 330 / 660	1800 / 2300 ^{sol} (419) / 2500	36000 ^{sol} (169) / 37000 / 38000	5100 / 5100 / 5000	10000 / 10000 / 10000
Aromatic EC >16-21 °	46 / 110 / 260	260 / 540 / 930	1900 / 1900 / 1900	28000 / 28000 / 28000	3800 / 3800 / 3800	7600 / 7700 / 7800
Aromatic EC >21-35 °	370 / 820 / 1600	1100 / 1500 / 1700	1900 / 1900 / 1900	28000 / 28000 / 28000	3800 / 3800 / 3800	7800 / 7800 / 7900
Aromatic EC >35-44 °	370 / 820 / 1600	1100 / 1500 / 1700	1900 / 1900 / 1900	28000 / 28000 / 28000	3800 / 3800 / 3800	7800 / 7800 / 7900
Aliphatic + Aromatic EC >44-70 °	1200 / 2100 / 3000	1600 / 1800 / 1900	1900 / 1900 / 1900	28000 / 28000 / 28000	3800 / 3800 / 3800	7800 / 7800 / 7900
Chloroalkanes & Chloroalkenes (SOM 1%/ 2.5%/ 6%)^{a, b, l, p}						
1,2-Dichloroethane	0.0046 / 0.0083 / 0.016	0.0071 / 0.011 / 0.019	0.0092 / 0.013 / 0.023	0.67 / 0.97 / 1.7	29 / 29 / 29	21 / 24 / 28
1,1,1 Trichloroethane (TCA)	48 / 110 / 240	8.8 / 18 / 39	9.0 / 18 / 40	660 / 1300 / 3000	140000 / 140000 / 140000	57000 ^{vap} (1425) / 76000 ^{vap} (2915) / 100000 ^{vap} (6392)
1,1,1,2 Tetrachloroethane	0.79 / 1.9 / 4.4	1.2 / 2.8 / 6.4	1.5 / 3.5 / 8.2	110 / 250 / 560	1400 / 1400 / 1400	1500 / 1800 / 2100
1,1,2,2 Tetrachloroethane	0.41 / 0.89 / 2.0	1.6 / 3.4 / 7.5	3.9 / 8.0 / 17	270 / 550 / 1100	1400 / 1400 / 1400	1800 / 2100 / 2300
Tetrachloromethane (Carbon Tetrachloride)	0.45 / 1.0 / 2.4	0.026 / 0.056 / 0.13	0.026 / 0.056 / 0.13	2.9 / 6.3 / 14	890 / 920 / 950	190 / 270 / 400
Trichloromethane (Chloroform)	0.42 / 0.83 / 1.7	0.91 / 1.7 / 3.4	1.2 / 2.1 / 4.2	99 / 170 / 350	2500 / 2500 / 2500	2600 / 2800 / 3100
Phenol & Chlorophenols^{a, b, l, p}						
Phenol	23 / 42 / 83	120 / 200 / 380	440 / 690 / 1200	440 ^{dir} (26000) / 690 ^{dir} (30000) / 1300 ^{dir} (34000)	440 ^{dir} (10000) / 690 ^{dir} (10000) / 1300 ^{dir} (10000)	440 ^{dir} (7600) / 690 ^{dir} (8300) / 1300 ^{dir} (93000)
Chlorophenols (excluding PCP) ⁱ	0.13 ^s / 0.3 / 0.7	0.87 ^s / 2.0 / 4.5	94 / 150 / 210	3500 / 4000 / 4300	620 / 620 / 620	1100 / 1100 / 1100
Pentachlorophenol (PCP)	0.03 / 0.08 / 0.19	0.22 / 0.52 / 1.2	27 ^{vap} (16.4) / 29 / 31	400 / 400 / 400	60 / 60 / 60	110 / 120 / 120
Other^{a, b, l, p}						
Carbon Disulphide	4.8 / 10 / 23	0.14 / 0.29 / 0.62	0.14 / 0.29 / 0.62	11 / 22 / 47	11000 / 11000 / 12000	1300 / 1900 / 2700
Hexachlorobutadiene (HCBD)	0.25 / 0.61 / 1.4	0.29 / 0.7 / 1.6	0.32 / 0.78 / 1.8	31 / 66 / 120	25 / 25 / 25	48 / 50 / 51
Pesticides (SOM 1%/ 2.5%/ 6%)^{a, b, l, p}						
Aldrin	3.2 / 6.1 / 9.6	5.7 / 6.6 / 7.1	7.3 / 7.4 / 7.5	170 / 170 / 170	18 / 18 / 18	30 / 31 / 31
Atrazine	0.5 / 1.2 / 2.7	3.3 / 7.6 / 17.4	610 / 620 / 620	9300 / 9400 / 9400	1200 / 1200 / 1200	2300 / 2400 / 2400
Dichlorvos	0.0049 / 0.010 / 0.022	0.032 / 0.066 / 0.14	6.4 / 6.5 / 6.6	140 / 140 / 140	16 / 16 / 16	26 / 26 / 27
Dieldrin	0.17 / 0.41 / 0.96	0.97 / 2 / 3.5	7.0 / 7.3 / 7.4	170 / 170 / 170	18 / 18 / 18	30 / 30 / 31
Alpha - Endosulfan	1.2 / 2.9 / 6.8	7.4 / 18 / 41	160 ^{vap} (0.003) / 280 ^{vap} (0.007) / 410 ^{vap} (0.016)	5600 ^{vap} (0.003) / 7400 ^{vap} (0.007) / 8400 ^{vap} (0.016)	1200 / 1200 / 1200	2400 / 2400 / 2500
Beta - Endosulfan	1.1 / 2.7 / 6.4	7.0 / 17 / 39	190 ^{vap} (0.00007) / 320 ^{vap} (0.0002) / 440 ^{vap} (0.0004)	6300 ^{vap} (0.00007) / 7800 ^{vap} (0.0002) / 8700	1200 / 1200 / 1200	2400 / 2400 / 2500
Alpha-Hexachlorocyclohexane	0.035 / 0.087 / 0.21	0.23 / 0.55 / 1.2	6.9 / 9.2 / 11	170 / 180 / 180	24 / 24 / 24	47 / 48 / 48
Beta - Hexachlorocyclohexane	0.013 / 0.032 / 0.077	0.085 / 0.2 / 0.46	3.7 / 3.8 / 3.8	65 / 65 / 65	8.1 / 8.1 / 8.1	15 / 15 / 16
Gamma – Hexachlorocyclohexane	0.0092 / 0.023 / 0.054	0.06 / 0.14 / 0.33	2.9 / 3.3 / 3.5	67 / 69 / 70	8.2 / 8.2 / 8.2	14 / 15 / 15
Chlorobenzenes^{a, b, l, p}						
Chlorobenzene	5.9 / 14 / 32	0.46 / 1.0 / 2.4	0.46 / 1.0 / 2.4	56 / 130 / 290	11000 / 13000 / 14000	1300 ^{sol} (675) / 2000 ^{sol} (1520) / 2900
1,2-dichlorobenzene (1,2-DCB)	94 / 230 / 540	23 / 55 / 130	24 / 57 / 130	2000 ^{sol} (571) / 4800 ^{sol} (1370) / 11000 ^{sol} (3240)	90000 / 95000 / 98000	24000 ^{sol} (571) / 36000 ^{sol} (1370) / 51000 ^{sol} (3240)
1,3-dichlorobenzene (1,3-DCB)	0.25 / 0.6 / 1.5	0.4 / 1.0 / 2.3	0.44 / 1.1 / 2.5	30 / 73 / 170	300 / 300 / 300	390 / 440 / 470
1-4-dichlorobenzene (1,4-DCB)	15 ⁱ / 37 ⁱ / 88 ⁱ	61 ^q / 150 ^q / 350 ^q	61 ^q / 150 ^q / 350 ^q	4400 ^{vap,q} (224) / 10000 ^{vap,q} (540) / 25000 ^{vap,q} (1280)	17000 ⁱ / 17000 ⁱ / 17000 ⁱ	36000 ^{vap,i} (224) / 36000 ^{vap,i} (540) / 36000 ^{vap,i} (1280)
1,2,3-Trichlorobenzene	4.7 / 12 / 28	1.5 / 3.6 / 8.6	1.5 / 3.7 / 8.8	102 / 250 / 590	1800 / 1800 / 1800	770 ^{vap} (134) / 1100 ^{vap} (330) / 1600 ^{vap} (789)
1,2,4- Trichlorobenzene	55 / 140 / 320	2.6 / 6.4 / 15	2.6 / 6.4 / 15	220 / 530 / 1300	15000 / 17000 / 19000	1700 ^{vap} (318) / 2600 ^{vap} (786) / 4000 ^{vap} (1880)

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

Determinand	Allotment	R _{WH} HP	R _{WO} HP	Commercial/ Industrial	POSresi	POSpark
1,3,5- Trichlorobenzene	4.7 / 12 / 28	0.33 / 0.81 / 1.9	0.33 / 0.81 / 1.9	23 / 55 / 130	1700 / 1700 / 1800	380 ^{vap} (36.7) / 580 ^{vap} (90.8) / 860 ^{vap} (217)
1,2,3,4-Tetrachlorobenzene	4.4 / 11 / 26	15 / 36 / 78	24 / 56 / 120	1700 ^{vap} (122) / 3080 ^{vap} (304) / 4400 ^{vap} (728)	830 / 830 / 830	1500 ^{vap} (122) / 1600 / 1600
1,2,3,5- Tetrachlorobenzene	0.38 / 0.90 / 2.2	0.66 / 1.6 / 3.7	0.75 / 1.9 / 4.3	49 ^{vap} (39.4) / 120 ^{vap} (98.1) / 240 ^{vap} (235)	78 / 79 / 79	110 ^{vap} (39.4) / 120 / 130
1,2,4,5- Tetrachlorobenzene	0.06 / 0.16 / 0.37	0.33 / 0.77 / 1.6	0.73 / 1.7 / 3.5	42 ^{sol} (19.7) / 72 ^{sol} (49.1) / 96	13 / 13 / 13	25 / 26 / 26
Pentachlorobenzene (P ₅ CB)	1.2 / 3.1 / 7.0	5.8 / 12 / 22	19 / 30 / 38	640 ^{sol} (43.0) / 770 ^{sol} (107) / 830	100 / 100 / 100	190 / 190 / 190
Hexachlorobenzene (HCB)	0.47 / 1.1 / 2.5	1.8 ^{vap} (0.20) / 3.3 ^{vap} (0.5) / 4.9	4.1 ^{vap} (0.20) / 5.7 ^{vap} (0.5) / 6.7 ^{vap} (1.2)	110 ^{vap} (0.20) / 120 / 120	16 / 16 / 16	30 / 30 / 30

Units are mg/kg Dry Weight

Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL3202. All rights reserved

R_{WH}HP Residential with homegrown produce

R_{WO}HP Residential without homegrown produce

POSresi public open spaces near residential housing

POSpark public open space for recreational use but not dedicated sports pitches

SOM Soil Organic Matter – **the S4UL for all organic compounds will vary according to SOM**

- a Based on a sandy loam soil as defined in SR3 (Environment Agency, 2009b) and 6% soil organic matter (SOM)
- b Figures rounded to two significant figures
- c Based only on a comparison of oral and dermal soil exposure with oral Index Dose
- d The background ADE is limited to being no larger than the contribution from the relevant soil ADE
- e Based on comparison of inhalation exposure with inhalation TDI only
- f Based on a lifetime exposure via the oral, dermal and inhalation pathways
- g Based on localised effects comparing inhalation exposure with inhalation ID only
- h Based on comparison of inhalation exposure with inhalation ID
- i Based on comparison of oral and dermal exposure with oral TDI
- j Based on comparison of oral, dermal and inhalation exposure with inhalation TDI
- k Based on comparison of all exposure pathways with oral TDI
- l S4ULs assume that free phase contamination is not present
- m S4ULs based on a sub-surface soil to indoor air correction factor of 10
- n The HCV applied is based on the intake of total Xylene and therefore exposure should not consider an isomer in isolation
- o Oral, dermal and inhalation exposure compared with oral HCV
- p S4ULs based on a sub-surface soil to indoor air correction factor of 1
- q Based on a comparison of inhalation exposure with the inhalation TDI for localised effects
- r Based on 2,4-dichlorophenol unless otherwise stated
- s Based on 2,3,4,6-tetrachlorophenol
- t Based on lowest GAC for all three xylene isomers
- u Measured concentrations of benzo(a)pyrene should be compared to the S4UL for benzo(a)pyrene as a single compound and to the S4UL for benzo(a)pyrene as a surrogate marker of genotoxic PAHs.
- vap S4UL presented exceeded the vapour saturation limit, which is presented in brackets
- sol S4UL presented exceeds the solubility saturation limit, which is presented in brackets
- dir S4ULs based on a threshold protective of direct skin contact, guideline in brackets based on the health effects following long term exposure provided for illustration only

Table 3: Soil Guideline Values (SGVs) for dioxins, furans and dioxin like PCBs

Determinand	Allotments	Residential with consumption of homegrown produce	Residential without consumption of homegrown produce	Commercial
Sum of PCDDs, PCDFs and dioxin-like PCBs	0.008	0.008	0.008	0.24

Units are mg/kg Dry Weight

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

Table 4: EIC/AGS/CL:AIRE Generic Assessment Criteria (GAC)

	Allotments	Residential with consumption of homegrown produce	Residential without consumption of homegrown produce	Commercial	Soil Saturation Concentration
Metals					
Antimony	ND	ND	550	7500	NA
Barium	ND	ND	1300	22000	NA
Molybdenum	ND	ND	670	17000	NA
Organics (SOM 1%/ 2.5%/ 6%)					
1,1,2 Trichloroethane	0.28 / 0.61 / 1.4	0.6 / 1.2 / 2.7	0.88 / 1.8 / 3.9	94 / 190 / 400	4030 / 8210 / 18000
1,1-Dichloroethane	9.2 / 17 / 35	2.4 / 3.9 / 7.4	2.5 / 4.1 / 7.7	280 / 450 / 850	1830 / 2960 / 5600
1,1-Dichloroethene	2.8 / 5.6 / 12	0.23 / 0.4 / 0.82	0.23 / 0.41 / 0.82	26 / 46 / 92	2230 / 3940 / 7940
1,2,4-Trimethylbenzene	0.38 / 0.93 / 2.2	0.35 / 0.85 / 2	0.41 / 0.99 / 2.3	42 / 99 / 220	557 / 1360 / 3250
1,2-Dichloropropane	0.62 / 1.2 / 2.6	0.024 / 0.042 / 0.084	0.024 / 0.042 / 0.085	3.3 / 5.9 / 12	1190 / 2110 / 4240
2,4-Dimethylphenol	3.1 / 7.2 / 17	19 / 43 / 97	210 / 410 / 730	16000 / 24000 / 30000	1380 / 3140 / 7240
2,4-Dinitrotoluene	0.22 / 0.49 / 1.1	1.5 / 3.2 / 7.2	170 / 170 / 170	3700 / 3700 / 3800	141 / 299 / 669
2,6-Dinitrotoluene	0.12 / 0.27 / 0.61	0.78 / 1.7 / 3.9	78 / 84 / 87	1900 / 1900 / 1900	287 / 622 / 1400
2-Chloronaphthalene	40 / 98 / 230	3.7 / 9.2 / 22	3.8 / 9.3 / 22	390 / 960 / 2200	114 / 280 / 669
Biphenyl	14 / 35 / 83	66 / 160 / 360	220 / 500 / 980	18000 / 33000 / 48000	34.4 / 84.3 / 201
Bis (2-ethylhexyl) phthalate	47 / 120 / 280	280 / 610 / 1100	2700 / 2800 / 2800	85000 / 86000 / 86000	8.68 / 21.6 / 51.7
Bromobenzene	3.2 / 7.6 / 18	0.87 / 2 / 4.7	0.91 / 2.1 / 4.9	97 / 220 / 520	853 / 1970 / 4580
Bromodichloromethane	0.016 / 0.032 / 0.068	0.016 / 0.03 / 0.061	0.019 / 0.034 / 0.07	2.1 / 3.7 / 7.6	1790 / 3220 / 6570
Bromoform	0.95 / 2.1 / 4.6	2.8 / 5.9 / 13	5.2 / 11 / 23	760 / 1500 / 3100	2690 / 5480 / 12000
Butyl benzyl phthalate	220 / 550 / 1300	1400 / 3300 / 7200	42000 / 44000 / 44000	940000 / 940000 / 950000	26.3 / 64.7 / 154
Chloroethane	110 / 200 / 380	8.3 / 11 / 18	8.4 / 11 / 18	960 / 1300 / 2100	2610 / 3540 / 5710
Chloromethane	0.066 / 0.13 / 0.23	0.0083 / 0.0098 / 0.013	0.0085 / 0.0099 / 0.013	1 / 1.2 / 1.6	1910 / 2240 / 2990
Cis 1,2 Dichloroethene	0.26 / 0.5 / 1	0.11 / 0.19 / 0.37	0.12 / 0.2 / 0.39	14 / 24 / 47	3940 / 6610 / 12900
Dichloromethane	0.1 / 0.19 / 0.34	0.58 / 0.98 / 1.7	2.1 / 2.8 / 4.5	270 / 360 / 560	7270 / 9680 / 15300
Diethyl Phthalate	19 / 41 / 94	120 / 260 / 570	1800 / 3500 / 6300	150000 / 220000 / 290000	13.7 / 29.1 / 65
Di-n-butyl phthalate	2 / 5 / 12	13 / 31 / 67	450 / 450 / 450	15000 / 15000 / 15000	4.65 / 11.4 / 27.3
Di-n-octyl phthalate	940 / 2100 / 3900	2300 / 2800 / 3100	3400 / 3400 / 3400	89000 / 89000 / 89000	32.6 / 81.5 / 196
Hexachloroethane	0.27 / 0.67 / 1.6	0.2 / 0.48 / 1.1	0.22 / 0.54 / 1.3	22 / 53 / 120	8.17 / 20.1 / 48.1
Isopropylbenzene	32 / 79 / 190	11 / 27 / 64	12 / 28 / 67	1400 / 3300 / 7700	390 / 950 / 2250
Methyl tert-butyl ether (MTBE)	23 / 44 / 90	49 / 84 / 160	73 / 120 / 220	7900 / 13000 / 24000	20400 / 33100 / 62700
Propylbenzene	34 / 83 / 200	34 / 82 / 190	40 / 97 / 230	4100 / 9700 / 21000	402 / 981 / 2330
Styrene	1.6 / 3.7 / 8.7	8.1 / 19 / 43	35 / 78 / 170	3300 / 6500 / 11000	626 / 1440 / 3350
Total Cresols (2-, 3- and 4-methylphenol)	12 / 27 / 63	80 / 180 / 400	3700 / 5400 / 6900	160000 / 180000 / 180000	15000 / 32500 / 73300
Trans 1,2 Dichloroethene	0.93 / 1.9 / 4	0.19 / 0.34 / 0.7	0.19 / 0.35 / 0.71	22 / 40 / 81	3420 / 6170 / 12600
Tributyl tin oxide	0.042 / 0.1 / 0.24	0.25 / 0.59 / 1.3	1.4 / 3.1 / 5.7	130 / 180 / 200	41.3 / 101 / 241

Units are mg/kg Dry Weight

Table 5: Tier 2 Criteria for the Assessment of Soils – Protection of Flora and Fauna

Parameter	ICRCL 70/90 ^a		SSVs ^b	Code of Practice for Agricultural Use of Sewage Sludge ^c	BS 3882:2015 Specification for topsoil and requirements for use
	Maximum				
	Livestock	Crop Growth			
	mg/kgDW	mg/kgDW	mg/kgDW	mg/kgDW	mg/kgDW
Antimony			37		
Arsenic	500	1000		50	
Cadmium	30	50	0.6	3	
Chromium				400	
Cobalt			4.2		
Copper	500	250	35.1	80/ 100/ 135/ 200 ^d	<100/<135/<200 ^e
Fluoride	1000			500	
Lead	1000			300	
Mercury				1	
Molybdenum			5.1	4	
Nickel			28.2	50/ 60/ 75/ 110 ^d	<60/<75/<110 ^e
Selenium				3	
Silver			0.3		
Vanadium			2.0		

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

Parameter	ICRCL 70/90 ^a		SSVs ^b	Code of Practice for Agricultural Use of Sewage Sludge ^c	BS 3882:2015 Specification for topsoil and requirements for use
	Maximum				Phytotoxic contaminants
	Livestock	Crop Growth			
	mg/kgDW	mg/kgDW	mg/kgDW	mg/kgDW	
Zinc	3000	1000	35.6	200/200/200/300 ^d	<200/<200/<300 ^e
Benzo(a)pyrene			0.15		
Bis(2-ethylhexyl) phthalate			13		
Hexachlorobenzene			0.002		
Pentachlorobenzene					
Pentachlorophenol			0.6		
Perfluorooctanoic acid			0.022		
Perfluorooctane sulfonate			0.014		
Polychlorinated alkanes medium chain			11.9		
Tetrachloroethene					
Toluene					
Triclosan			0.13		
Tris(2-chloroethyl)phosphate			1.1		
Tris(2-chloro-1-methylethyl) phosphate			1.8		

- a. Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL) 70/90 Restoration and Aftercare of Metalliferous Mining Sites for Pasture and Grazing 1st edition 1990.
- b. Soil screening values for assessing ecological risks, EA 2017a Report – ShARE id26
- c. Maximum permissible concentration of potentially toxic elements for Arable land from the Sewage sludge in agriculture: code of practice.. There are also criteria for Grassland which are higher than for Arable.
- d. Where four values are presented, concentrations are for soils with pH values 5.0-5.5/ 5.5-6.0/ 6.0-7.0/ >7.0 (and the soils contain more than 5% calcium carbonate)
- e. Where three values are presented, concentrations are for soils with pH values <6.0/ 6.0-7.0/ >7.0

Table 6: Tier 2 Criteria for Screening Liquids

	Screening Concentration (mg/l)			
	Minimum Reporting Value	Human Consumption	Fresh Water/Inland	Salt Water/Other
Arsenic SP	-	0.01	0.05 ⁽²⁾	0.025 ⁽²⁾
Boron	-	1	-	-
Cadmium PS	0.0001	0.005	≤0.00008, 0.00008, 0.00009, 0.00015, 0.00025 ⁽¹⁴⁾	0.0002
Chromium (total)	-	0.05	-	-
Chromium (III) SP	-	-	0.0047	-
Chromium (VI) SP	-	-	0.0034	0.0006
Copper SP	-	2	0.001 bioavailable	0.00376 bioavailable
Iron SP	-	0.2	1	1
Lead PS	-	0.01	0.0012 bioavailable	0.0013 bioavailable
Mercury compounds PS	0.00001	0.001	0.00007 max	0.00007 max
Manganese SP	-	0.05	0.123 bioavailable	-
Nickel PS	-	0.02	0.004 bioavailable	0.0086 bioavailable
Selenium	-	0.01	-	-
Zinc SP	-	5 ⁽³⁾	0.0109bioavailable ⁽¹³⁾	0.0068bioavailable ⁽¹³⁾
Chlorinated Compounds				
C10-13 chloroalkanes PS short chain chlorinated paraffins	-	-	0.0004	0.0004
Dichloromethane PS	-	-	0.02	0.02
1,2-Dichloroethane PS	0.001	0.003	0.01	0.01

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

	Screening Concentration (mg/l)			
	Minimum Reporting Value	Human Consumption	Fresh Water/Inland	Salt Water/Other
Trichloroethene PS	0.0001	0.01 ⁽⁵⁾	0.01	0.01
1,1,1-Trichloroethane	0.0001	-	-	-
1,1,2-Trichloroethane	0.0001	-	-	-
Trichloromethanes PS	-	0.1 ⁽¹⁾	0.0025	0.0025
1, 2, 4-Trichlorobenzene	0.00001	-	-	-
Tetrachloroethene PS	0.0001	0.01 ⁽⁵⁾	0.01	0.01
Tetrachloromethane/ Carbon tetrachloride PS	0.0001	0.003	0.012	0.012
Tetrachloroethane SP	-	-	0.140	-
Vinyl chloride	-	0.0005	-	-
Trichlorobenzene (TCB) PS	-	-	0.0004	0.0004
Chloroform	0.0001	-	-	-
Chloronitrotoluenes(CNT) ⁽¹¹⁾	0.001	-	-	-
Hexachlorobutadiene PS	0.000005	-	0.0006 max	0.0006 max
Hexachlorocyclohexanes (HCH) PS	0.000001	-	0.00002	0.000002
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	-	-	-	-
Acenaphthylene	-	-	-	-
Anthracene PS	-	-	0.0001	0.0001
Benzo(a)anthracene	-	-	-	-
Benzo(b)fluoranthene PS	-	0.0001 ⁽¹⁰⁾	0.000017 max ⁽¹²⁾	0.000017 max ⁽¹²⁾
Benzo(a)pyrene PS	-	0.00001	0.00000017	0.00000017
Benzo(k)fluoranthene PS	-	0.0001 ⁽¹⁰⁾	0.000017 max ⁽¹²⁾	0.000017 max ⁽¹²⁾
Benzo(g,h,i)perylene PS	-	0.0001 ⁽¹⁰⁾	0.0000082 max ⁽¹²⁾	0.00000082 max ⁽¹²⁾
Indeno(1,2,3-cd)pyrene PS	-	0.0001 ⁽¹⁰⁾	- ⁽¹²⁾	- ⁽¹²⁾
Chrysene	-	-	-	-
Dibenzo(a,h)anthracene	-	-	-	-
Fluoranthene PS	-	-	0.0000063	0.0000063
Fluorene	-	-	-	-
Phenanthrene	-	-	-	-
Pyrene	-	-	-	-
Naphthalene PS	-	-	0.002	0.002
Polycyclic Aromatic Hydrocarbons	-	0.0001 ⁽¹⁰⁾	-	-
Petroleum hydrocarbons				
Petroleum hydrocarbons/Mineral oil	-	0.01 ⁽³⁾	-	-
Benzene PS	0.001	0.001	0.01	0.008
Toluene SP	0.004	0.7 ⁽⁹⁾	0.074	0.074
Ethylbenzene	-	0.3 ⁽⁹⁾	-	-
Xylenes	0.003 ⁽⁴⁾	0.5 ⁽⁹⁾	-	-
Methyl tert-butyl ether (MTBE)	-	0.015 ⁽⁷⁾	-	-
Pesticides and Herbicides				
Alachlor PS	-	-	0.0003	0.0003
Aldrin PS	0.000003	0.00003	0.00001 ⁽⁶⁾	0.000005 ⁽⁶⁾
Dieldrin PS	0.000003	0.00003		
Endrin PS	0.000003	0.0006 ⁽⁹⁾		
Isodrin	0.000003	-	-	-
2,4 dichlorophenol SP	0.0001	-	0.0042	0.00042
2,4 D ester SP	0.0001	-	0.0003	0.0003
op and pp DDT (each) PS	0.000002	0.001 ⁽⁶⁾	0.000025 ⁽⁶⁾	0.000025 ⁽⁶⁾
op and pp DDE (each)	0.000002	-	-	-
op and pp TDE (each)	0.000002	-	-	-
Dimethoate SP	0.00001	-	0.00048	0.00048
Endosulfan PS	0.000005	-	0.000005	0.0000005
Hexachlorobenzene PS	0.000001	-	0.00005 max	0.00005 max
Permethrin SP	0.000001	-	0.000001	0.0000002
Atrazine PS	0.00003	-	0.0006	0.0006
Simazine PS	0.00003	-	0.001	0.001
Linuron SP	-	-	0.0005	0.0005
Mecoprop SP	-	-	0.018	0.018
Trifluralin PS	0.00001	-	0.00003	0.00003
Total pesticides	-	0.0005	-	-

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

	Screening Concentration (mg/l)			
	Minimum Reporting Value	Human Consumption	Fresh Water/Inland	Salt Water/Other
Miscellaneous				
Ammoniacal nitrogen (as NH ₄ ⁺)	-	0.5	0.26 ¹⁶ 0.39 ¹⁷	-
Ammoniacal nitrogen (as N)	-	0.39	0.2 ¹⁶ 0.3 ¹⁷	-
Unionised Ammonia (NH ₃) SP	-	-	-	0.021
Chloride	-	250	-	-
Chlorine SP	-	-	0.002	0.01 max
Cyanide SP (hydrogen cyanide)	-	0.05	0.001	0.001
Nitrate (as NO ₃)	-	50	-	-
Nitrite (as NO ₂)	-	0.1	-	-
Phenol SP	-	0.005 ⁽³⁾	0.0077	0.0077
Pentachlorophenol PS	0.0001	-	0.0004	0.0004
PCBs (individual congeners)	0.000001	-	-	-
Sodium	-	200	-	-
Sulphate	-	250	-	-
Tributyl and triphenyl tin compounds (each) PS	0.000001	-	0.0000002	0.0000002
Di(2-ethylhexyl)-phthalate PS	-	-	0.0013	0.0013

Substances highlighted in yellow are hazardous substances, PS = Priority Substances, SP = Specific Pollutants, '-' screening concentration is not available, 'max' – maximum allowable concentration used where no annual average provided

Notes:

1. Concentration for trihalomethanes is the sum of chloroform, bromoform, dibromochloromethane and bromodichloromethane.
2. Concentration is the dissolved fraction of a water sample obtained by filtration through a 0.45µm filter.
3. Concentration is taken from Statutory Instrument 1989 No. 1147. The Water Supply (Water Quality) Regulations 1989, as amended.
4. Concentration for xylenes is 0.003mg/l each for o-xylene and m/p xylene.
5. Concentration is the Sum of TCE and PCE.
6. Concentration is for Total DDT. Para DDT on its own has a target concentration of 0.00001mg/l.
7. Concentration for MTBE is taken from Environment Agency guidance, dated 2006.
8. Concentration is the sum of aldrin, dieldrin, endrin.
9. Concentration is taken from WHO (2004) guidelines for drinking-water quality.
10. Sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno(1,2,3-cd)pyrene
11. Concentration is for 2,6-CNT, 4,2-CNT, 4,3-CNT, 2,4-CNT, 2,5-CNT
12. BAP can be considered as a marker of the other PAHs for comparison with the annual average
13. Concentration plus ambient background concentration (dissolved)
14. For cadmium and its compounds the EQS depends on the hardness of the water (Class 1: < 40 mg CaCO₃/l, Class 2: 40 to < 50 mg CaCO₃/l, Class 3: 50 to < 100 mg CaCO₃/l, Class 4: 100 to < 200 mg CaCO₃/l and Class 5: ≥ 200 mg CaCO₃/l).
15. Manufactured and used in industrial applications, such as flame retardants and plasticisers, as additives in metal working fluids, in sealants, paints, adhesives, textiles, leather fat and coatings. Persistent, bioaccumulate and toxic to aquatic life (carcinogen in rat studies). Candidate Persistent Organic Pollutant (POP).
16. Acceptable 90th percentile concentration for a freshwater lake/river with "High" chemical quality standard and alkalinity (as mg/l CaCO₃) < 50 mg/L or alkalinity < 200 mg/L where river elevation > 80 m above Ordnance Datum (mAOD). See the Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 for further details.
17. Acceptable 90th percentile concentration for a freshwater lake/river with "High" chemical quality standard and alkalinity (as mg/l CaCO₃) ≥ 50 mg/L where river elevation < 80 m mAOD or > 200 mg/l where river elevation > 80 mAOD. See the Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 for further details.

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

Table 7: Tier 2 Criteria for Screening Groundwater Vapour Generation Hazard

Chemical	CAS	GAC _{gw vap} (µg/l) ^{1,2}		Aqueous Solubility (µg/l)
		Residential	Commercial	
Petroleum Hydrocarbons				
1,2,4-Trimethylbenzene	95-63-6	24	2,200	559,000
Benzene ³	71-43-2	210	20,000	1,780,000
Ethylbenzene ³	100-41-4	10,000	960,000 (sol)	180,000
Isopropylbenzene	98-82-8	850	86,000 (sol)	56,000
Propylbenzene	103-65-1	2,700	240,000 (sol)	54,100
Styrene	100-42-5	8,800	810,000 (sol)	290,000
Toluene ³	108-88-3	230,000	21,000,000 (sol)	590,000
TPH Aliphatic EC5-EC6 ³		1,900	190,000 (sol)	35,900
TPH Aliphatic >EC6-EC8 ³		1,500	150,000 (sol)	5,370
TPH Aliphatic >EC8-EC10 ³		57	5,700 (sol)	427
TPH Aliphatic >EC10-EC12 ³		37	3,600 (sol)	34
TPH Aromatic >EC5-EC7 ^{2,3}		210,000	20,000,000 (sol)	1,780,000
TPH Aromatic >EC7-EC8 ³		220,000	21,000,000 (sol)	590,000
TPH Aromatic >EC8-EC10 ³		1,900	190,000 (sol)	64,600
TPH Aromatic >EC10-EC12 ³		6,800	660,000 (sol)	24,500
TPH Aromatic >EC12-EC16 ³		39,000	3,700,000 (sol)	5,750
meta-Xylene ^{3,5}	108-38-3	9,500	940,000 (sol)	200,000
ortho-Xylene ^{3,5}	95-47-6	12,000	1,100,000 (sol)	173,000
para-Xylene ^{3,5}	106-42-3	9,900	980,000 (sol)	200,000
Polycyclic Aromatic Hydrocarbons (PAH)				
Acenaphthene	83-32-9	170,000 (sol)	15,000,000 (sol)	4,110
Acenaphthylene	208-96-8	220,000 (sol)	20,000,000 (sol)	7,950
Fluorene	86-73-7	210,000 (sol)	18,000,000 (sol)	1,860
Naphthalene	91-20-3	220	23,000 (sol)	19,000
Pesticides				
Aldrin	309-00-2	47 (sol)	3,700 (sol)	20
alpha-Endosulfan	959-98-8	7,400 (sol)	590,000 (sol)	530
beta-Endosulfan	33213-65-9	7,500 (sol)	600,000 (sol)	280
Halogenated Organics				
1,1,1,2-Tetrachloroethane	79-34-5	240	22,000	1,110,000
1,1,1-Trichloroethane	71-55-6	3,000	290,000	1,300,000
1,1,2,2-Tetrachloroethane	79-35-4	1,600	150,000	2,930,000
1,1,2-Trichloroethane	79-00-5	520	49,000	4,491,000
1,1-Dichloroethane	75-34-3	2,700	260,000	3,666,000
1,1-Dichloroethene	75-35-4	160	1,6000	3,100,000
1,2,3,4-Tetrachlorobenzene	634-66-2	240	31,000 (sol)	7,800
1,2,3,5-Tetrachlorobenzene	634-90-2	7.0	600	3,500
1,2,3-Trichlorobenzene	87-61-7	35	3,100	21,000
1,2,4,5-Tetrachlorobenzene	95-94-3	8.1	700 (sol)	600
1,2,4-Trichlorobenzene	120-82-1	68	7,200	41,400
1,2-Dichlorobenzene	95-50-1	2,000	220,000 (sol)	133,000
1,2-Dichloroethane	107-06-2	8.9	850	8,680,000
1,2-Dichloropropane	78-87-5	22	2,600	2,050,000
1,3,5-Trichlorobenzene	108-70-3	7.4	660	6,000
1,3-Dichlorobenzene	541-73-1	31	2,800	103,000
1,4-Dichlorobenzene	106-46-7	5,000	460,000 (sol)	51,200
Bromobenzene	108-86-1	220	20,000	388,040
Bromodichloromethane	75-27-4	17	1,600	3,000,000
Bromoform (Tribromomethane)	75-25-2	3,100	400,000	3,000,000
Chlorobenzene	108-90-7	98	15,000	387,000
Chloroethane	75-00-3	10,000	1,000,000	5,742,000
Chloroethene (Vinyl Chloride)	75-01-4	0.62	63	2,760,000
Chloromethane	74-87-3	14	1,400	5,350,000
cis-1,2-Dichloroethene	156-59-2	130	13,000	7,550,000
Dichloromethane	75-09-2	3,300	370,000	20,080,000
Hexachlorobenzene	118-74-1	16 (sol)	1,400 (sol)	10
Hexachlorobutadiene	87-68-3	1.7	230	4,800
Hexachloroethane	67-72-1	8.5	740	49,900

Stantec Guide: Criteria Used in Generic Quantitative Risk Assessment (England)

Chemical	CAS	GAC _{gwvap} (µg/l) ^{1,2}		Aqueous Solubility (µg/l)
		Residential	Commercial	
Pentachlorobenzene	608-93-5	140	12,000 (sol)	500
Tetrachloroethene	127-18-4	34	4,600	225,000
Tetrachloromethane (Carbon Tetrachloride)	56-23-5	5.3	770	846,000
<i>trans</i> -1,2-Dichloroethene	156-60-5	160	16,000	5,250,000
Trichloroethene	79-01-6	5.7	530	1,370,000
Trichloromethane (Chloroform)	67-66-3	790	85,000	8,950,000
Others (organic and inorganic)				
2-Chloronaphthalene	91-58-7	160	14,000 (sol)	11,700
Biphenyl (Limonene)	92-52-4	15,000 (sol)	1,300,000 (sol)	4,060
Carbon Disulphide	75-15-0	56	5,600	2,100,000
Mercury, elemental	7439-97-6	1.1	95 (sol)	56
Methyl tertiary butyl ether (MTBE)	1634-04-4	83,000	7,800,000	48,000,000

Notes

1. GAC in *italics* with (sol) exceed aqueous solubility.
2. GAC rounded to two significant figures.
3. The GAC for these petroleum hydrocarbon contaminants have been calculated using a sub-surface soil to indoor air correction factor of 10 in line with the physical-chemical data sources.
4. The GAC for TPH fractions do not account for genotoxic mutagenic effects. Concentrations of TPH Aromatic >EC5-EC7 should therefore also be compared with the GAC for benzene to ensure that such effects are also assessed.
5. The Health Criteria Value used for each xylene isomer was for total xylene. If site specific additivity assessments are not completed, as a conservative measure the sum of isomer concentrations should be compared to the lowest xylene GAC (as is the case for soil GAC).

Appendix G Geo-Environmental Assessment – Selection of Assessment Criteria

Selection of Soil Assessment Criteria Protective of Human Health

The results of the soil testing have been compared to the Suitable 4 Use Levels (S4UL) (Nathanail et al, 2015) and the Category 4 Screening Level (C4SL) for lead, prepared under the auspices of Defra (CL:AIRE, 2014).

The GAC for a Commercial/industrial end-use have been selected as these are considered to be the most appropriate for the protection of construction workers undertaking the development and the SWS workers who will be present at the Site during its operational phase. The GAC have been generated assuming short exposure periods over a long timescale.

The GAC have been generated using assumptions regarding soil characteristics. Where the published GAC are dependent upon Soil Organic Matter (SOM), a value of 1% has been used to provide a conservative assessment. Consideration of the default soil properties used to generate the soil GAC for protection of human health is important as these influence the fate, transport, and behaviour of contaminants.

- Soil type – the model default is set as Sandy Loam and assumes a dry and relatively porous soil. The default is considered sufficiently similar to the cover/restoration soils which are variably clayey / sandy. The waste mass is not a soil type and comparison to the GAC are provided for information.
- pH – pH influences the cation exchange capacity and the partitioning behaviour of a chemical between soil and water. The default is pH 7. The cover soils at the Site have been found to have a pH of typically between 7.5 and 8.5, with only one sample of the cover soils recording a pH considerably outside of this range (5.92).

Hydrocarbon Hazard Index

In addition to the comparison of the individual hydrocarbon fraction results to their respective GAC, it is necessary to also consider the potential for harm to human health due to additive effects of the hydrocarbons.

The additive effect of the hydrocarbon fractions is considered by calculating a hazard quotient (HQ) for each fraction (hydrocarbon band) which is the result for the fraction/band divided by the fraction S4UL criterion. All HQ are added to give a Hazard Index (HI). If the HI exceeds unity (1) then this can indicate a potentially significant human health risk. The result of this calculation is included in the results review below.

In addition to the comparison of the individual hydrocarbon fraction results to their respective GAC it is necessary to also consider the potential for harm to human health due to additive effects of the hydrocarbons.

The additive effect of the hydrocarbon fractions is considered by calculating a hazard quotient (HQ) for each fraction (hydrocarbon band) which is the result for the fraction/band divided by the fraction S4UL criterion. All HQ are added to give a Hazard Index (HI). If the HI exceeds unity (1) then this can indicate a potentially significant human health risk.

Selection of Water Assessment Criteria Protective of Human Health

The Site is located over a superficial Secondary A aquifer (Raised Marine Deposits / River Terrace Deposits) and a bedrock Principal Aquifer (Lewes Nodular Chalk Formation).

Groundwater levels beneath the Site appear to be tidally influenced and the Site is located within reclaimed former marine land (i.e., saline conditions are likely to be prevalent), it is therefore considered that potable abstraction is highly unlikely to be a future consideration and on this basis an assessment of these aquifers as a potential resource in case of future abstraction and use as a drinking water resource has not been undertaken. This is consistent with the EA's view in an earlier consultation¹⁷ where the EA stated, in regard to the chalk *"While it is notionally a principal aquifer, we recognise that given the site setting, it is unlikely to have significant resource potential"*.

When assessing ground condition data and the potential to harm Controlled Waters, Stantec uses the approach presented in Groundwater Protection Policy and Practice (GP3) (EA, 2017).

Selection of Water Assessment Criteria Protective of Aquatic Eco-Systems (Controlled Waters)

The Site is located immediately west of the re-aligned Hermitage Stream. The Hermitage Stream flows southwards into Langstone Harbour, a tidal inlet of the English Channel located approximately 200 m south of the Site. Langstone Harbour is a designated SSSI, SAC, SPA, a wetland of international importance designated under the Ramsar Convention and a WFD safeguarded Groundwater Dependent Terrestrial Ecosystem (GWDTE).

The original course of the Hermitage Stream flowed through the Site, before being truncated by the construction of the bund wall and landfills, A27 and associated slip roads, and Harts Farm Way. A review of historical aerial imagery and reports suggests that the former channel may have been culverted beneath Harts Farm Way and an outlet/sluice to Langstone Harbour may have been present in the bund wall to the south of the Site. The outlet may have been sealed in the late 1970s, and there is no visual evidence of such a feature remaining today.

The landfill waste at the site has been deposited directly upon either the predominantly granular superficial Raised Marine Deposits / River Terrace Deposits, or onto the underlying Chalk bedrock. The superficial deposits directly overlie the chalk. There is therefore a direct pathway for potential contamination within the landfill to enter the underlying aquifers.

The results of the testing undertaken on the samples of groundwater and landfill leachate have therefore been compared to saltwater Environmental Quality Standards (EQS).

¹⁷ Email from Tom Wickens (EA) to David Jackson (DS) dated 12th January 2021

Bioavailable Environmental Quality Standards (EQS)

Bioavailable Environmental Quality Standards (EQS) have been developed for UK Specific Pollutants copper, zinc and manganese and the EU priority substances lead and nickel. An EQS is the concentration of a chemical in the environment below which there is not expected to be an adverse effect on the specific endpoint being considered, e.g., the protection of aquatic life.

The bioavailability of a metal depends on a number of physico-chemical factors which govern both metal behaviour and the interactions of the toxic forms of the metals with a biological receptor.

The EQS bioavailable corresponds to the bioavailable fraction (BioF) of dissolved metal in a sample, as determined by the physico-chemical characteristics of the water and can be calculated using a biotic ligand model (BLM) or other calculation method. To assess compliance, the bioavailable fraction of dissolved metal can be compared to the EQS bioavailable. However, bioavailable metal is not the same metric as dissolved metal as only a fraction of the dissolved metal will usually be bioavailable.

It is very difficult to measure the bioavailable concentration of a metal directly. Biotic Ligand Models (BLMs) are a predictive tool that can take account of water quality parameters such as pH, and calcium to determine the amount of bioavailable metal present. However, the complexity of the models, the runtime per sample, input data requirements and level of operator skill needed to interpret the model outputs mean that few regulatory organisations have adopted the full BLMs. The UK has developed simplified Metal Bioavailability Assessment Tool (M-BAT) for copper, zinc, nickel, and manganese.

Neither DS nor WYG have undertaken the necessary geo-environmental laboratory analyses required to generate site-specific Predicted No Effect Concentrations (PNEC) suitable for the protection of the identified receptors. On this basis, to provide a conservative assessment the results have been compared against the EQS for copper, zinc, manganese, lead and nickel without a correction for bioavailability.

Limit of Detection vs. Generic Assessment Criteria

The table below shows the potential contaminants for which the method detection limit exceeds the corresponding generic assessment criterion. Numbers in brackets denote the number of positive detections out of the 97 samples. It is noted that testing with a method detection limit lower than the environmental quality standards for the PAHs listed in the table below is typically not offered by standard commercial laboratories.

Table 1 - Comparison of Laboratory Limit of Detection against Environmental Quality Standards

Determinand	Method Detection Limit (µg/l)	Environmental Quality Standard (µg/l)
Hexavalent Chromium	5.00 (0)	0.60
Trichlorobenzene (1,2,3 & 1,2,4)	2.00 (0)	0.40
Fluoranthene	0.01 (0)	0.0063
Benzo(a)pyrene	0.01 (0)	0.00017
Benzo(g,h,i)perylene	0.01 (0)	0.0082
Hexachlorobutadiene	1.00 (0)	0.60

For all determinands analysed, but not listed in the table above, the limits of detection were below the relevant generic assessment criteria.

Where the concentration of a determinand is below the limits of detection and the limits of detection are below the relevant threshold criterion, the concentrations recorded are not considered to present a hazard to human health or controlled waters.

Where the concentration of a determinand is below the limit of detection and the limit of detection is greater than the relevant threshold criterion, ultra-low analysis or further Detailed Quantitative Risk Assessment would be required to robustly conclude that these can be eliminated as hazards.

Appendix H Geo-Environmental Laboratory Analyses (Soils) – Summary Tables



SOM 1%

Assessment Criteria are the Suitable for Use Levels (S4ULs) published by LQM/CIEH (Copyright Land Quality Management Limited Reproduced with Permission; Publication Number S4UL3202. All Rights Reserved) unless the analyte is marked with *. Analytes identified with * the Assessment Criteria are Category 4 Screening Levels (C4SL).

This is a summary table and it is possible that not all analytical results are reproduced. Whilst we endeavour to present the data accurately errors can occur during transcribing. The laboratory certificate should be referred to as the authenticated and complete source of results.

Land-use Scenarios - RwhP = Residential with Home Grown Produce, RwhNP = Residential without Home Grown Produce, POSresi = Public Open Space within residential, POSpark = Public Open Space not associated with residential.

LOD = Limit of Detection. Results in italics are equal to or less than the LOD.

This table should be read in conjunction with the accompanying guide on the selection of evaluation criteria and the project specific note presenting the justification for selection.

HAVANT WRP - LP72 (COVER SOILS ONLY)

Assessment Criteria are the Suitable for Use Levels (S4ULs) published by LQM/CIEH (Copyright Land Quality Management Ltd). This is a summary table and it is possible that not all analytical results are reproduced. Whilst we endeavour to present the data, Land-use Scenarios - RwhP = Residential with Home Grown Produce, RwoHP = Residential without Home Grown Produce, PLOD = Limit of Detection. Results in italics are equal to or less than the LOD. This table should be read in conjunction with the accompanying guide on the selection of evaluation criteria and the project specification.

TABLE SUMMARISING SOIL RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE SOIL ASSESSMENT CRITERIA
HAVANT WRP - LP72 (LANDFILL WASTE ONLY)

SOM 1%			Strata	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL		
Assessment Criteria			RO101	RO101	RO102	RO102	RO103	RO104	RO105	RO105	RO106	RO106	RO107	RO108	RO108	RO109	TP101	TP102	TP103	TP104	TP105	TP106	TP107	TP108	TP109	TP110	TP111	TP112	
Analyte	Units	LOD	Commercial	2.30	3.00	2.30	4.00	3.10	5.00	2.00	6.00	2.00	11.00	3.50	3.20	4.50	2.40	2.50	1.70	1.80	2.00	3.00	3.00	1.70	2.00	3.50	1.50	2.00	3.50
Stones Content	%		-																										
Arsenic*	mg/kg	1	640		7.7	48	13	11	14	14		15		10	11		11	12			11		10	12	22	16	14	13	11
Cadmium*	mg/kg	0.2	190		0.6	4.2	2.2	0.6	2.6	2.5		11		0.7	0.9		12	0.8			1.7		1.3	1.2	35	16	13	11	2.1
Chromium Trivalent	mg/kg	1	8600		21	610		28	55								32				26		34	60	48			22	
Chromium Hexavalent*	mg/kg	1.2	33		1.2	1.2	1.2	1.2	1.2	1.2		1.2		1.2	1.2		1.2	1.2			1.8		1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	mg/kg	1	68000		47	1500	190	31	310	96		440		23	77		320	75			80		58	47	1400	590	750	200	70
Lead*	mg/kg	1	2300		110	160	45	67	200	270		800		54	150		480	140			170		120	99	1400	660	460	450	160
Mercury	mg/kg	0.3	1100		0.3	0.3	0.3	0.3	0.3	0.3		0.3		0.3	0.3		0.8	0.3			0.3		0.3	0.3	1.7	0.8	0.3	0.4	0.3
Nickel	mg/kg	1	980		14	630	110	20	240	41		50		24	23		37	26			120		240	28	100	92	49	28	18
Selenium	mg/kg	1	12000																										
Zinc	mg/kg	1	730000		230	300	75	93	580	440		1500		90	200		1600	340			400		410	190	4700	2000	2200	880	330
Beryllium	mg/kg	0.5	12																										
Boron	mg/kg		240000																										
Vanadium	mg/kg		9000																										
Cyanide (Total)	mg/kg		-																										
Organic matter	mg/kg		-																										
Phenol, (Total)	mg/kg	0.2	440	0.2	0.4	0.2		0.2	0.2	0.2	0.2	0.2			0.2					0.2		0.2	0.2	0.2	0.2		0.2	0.2	
Sulphate (Total) as SO4	mg/l		-																										
pH	pH Units		-																8.3	8.2		7.6		7.9	8.6				
>C5 to C6 Aliphatic	mg/kg	0.001	3200	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001		0.001	0.001			0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001
>C6 to C8 Aliphatic	mg/kg	0.001	7800	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001		0.001	0.001			0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001
>C8 to C10 Aliphatic	mg/kg	0.001	2000	1.3	0.001	9.8	6.7	0.93	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	2.4			0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001	
>C10 to C12 Aliphatic	mg/kg	1	9700	2.7	28	770	86	11	1	6.6	5.2	1	1	1	3.9		6.6			3.6		12	22	1	3.5	1.2	1	3.3	
>C12 to C16 Aliphatic	mg/kg	2	59000	9.5	81	400	120	32	36	12	17	12	30	3.8	13		14	23		35		18	12	9.4	13	6.2	2	42	
>C16 to C21 Aliphatic	mg/kg	8		23	170	680	170	78	94	33	97	32	280	30	30		24	68		94		34	8	24	32	17	8	91	
>C21 to C35 Aliphatic	mg/kg	8	-	270	2200	3800	2100	390	510	360	1700	140	990	540	170		100	240		520		430	40	300	280	170	16	200	
>C16 to C35 Aliphatic	mg/kg	16	1600000	293	2370	4480	2270	468	604	393	1791	172	1270	570	200		124	308		614		464	48	324	312	187	24	291	
>C35 to C44 Aliphatic	mg/kg		1600000																										
Total Aliphatic C5-C35	mg/kg	10	-	310	2500	5700	2400	510	640	410	1800	180	1300	570	220		140	340		650		500	81	330	320	190	16	330	
>C5 to C7 Aromatic	mg/kg	0.001	26000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001		0.001	0.001		0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001	
>C7 to C8 Aromatic	mg/kg	0.001	56000	0.001	0.11	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.001		0.001	0.001		0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001	
>C8 to C10 Aromatic	mg/kg	0.001	3500	0.93	2.8	5.6	3.1	0.21	0.001	0.001	0.001	0.001	0.35	0.3	0.001		0.001	1.9		0.57		0.001	0.001	0.001	0.001	0.001	0.001	0.001	
>C10 to C12 Aromatic	mg/kg	1	16000	3.1	21	45	43	2.7	1	5.7	9.6	11	26	1	1.3		1	14		9.5		1	27	1	11	7.6	1	34	
>C12 to C16 Aromatic	mg/kg	2	36000	8.9	77	120	110	26	55	13	30	26	66	2	9.2		7.4	20		27		8.1	18	4.8	17	13	20	160	
>C16 to C21 Aromatic	mg/kg	10	28000	21	220	230	220	78	110	26	120	34	340	10	17		29	47		62		39	18	20	56	41	18	230	
>C21 to C35 Aromatic	mg/kg	10	28000	110	890	590	1000	230	340	140	490	80	670	46	63		80	130		350		260	17	77	200	99	46	320	
>C35 to C44 Aromatic	mg/kg		28000																										
Total Aromatic C5-C35	mg/kg		-	144	1211	991	1376	337	506	185	650	151	1102	59	91		117	213		449		308	80	103	284	161	85	744	
TPH Ali/Aro	mg/kg		-	454	3711	6691	3776	847	1146	595	2450	331	2402	629	311		257	553		1099		808	161	433	604	351	101	1074	
EPH (C10-C40)	mg/kg		-																										
Hazard Index - Commercial	-	-	-	0.007	0.050	0.131	0.066	0.014	0.019	0.008	0.025	0.006	0.041	0.003	0.004		0.005	0.010			0.019		0.013	0.006	0.004	0.011	0.006	0.003	0.027
Hazard Index - Commercial	-	-	-	0.007	0.050	0.131	0.066	0.014	0.019	0.008	0.025	0.006	0.041	0.003	0.004		0.005	0.010			0.019		0.013	0.006	0.004	0.011	0.006	0.003	0.027
Hazard Index - Commercial	-	-	-	0.007	0.050	0.131	0.066	0.014	0.019	0.008	0.025	0.006	0.041	0.003	0.004		0.005	0.010			0.019		0.013	0.006	0.004	0.011	0.006	0.003	0.027
Benzene*	mg/kg	0.001	27	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001		0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Ethylbenzene	mg/kg	0.001	5700	0.032	0.18	0.095	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.068	0.056	0.001	0.046	0.001	1.2		0.085	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Toluene	mg/kg	0.001	56000	0.001	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.001	0.001	0.001	0.001		0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Xylene	mg/kg		6600																										
M- & P-Xylene	mg/kg	0.001	-	0.14	0.5	0.72	0.35	0.001	0.001	0.001	0.001	0.001	0.085	0.15	0.001	0.036	0.001	0.16		0.034		0.001	0.001	0.001	0.001	0.001	0.001	0.001	
O-Xylene	mg/kg	0.001	-	0.046	0.16	2.5	0.076	0.001	0.001	0.001	0.001	0.001	0.026	0.04	0.001	0.021	0.001	0.064		0.061		0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Xylene (M, P & O)	mg/kg	0.002	6600	0.186	0.66	3.22	0.426	0.002	0.002	0.002	0.002	0.002	0.111	0.19	0.002	0.057	0.002	0.224		0.095		0.002	0.002	0.002	0.002	0.002	0.002	0.002	
MTBE	mg/kg	0.001	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001		0.001		0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Naphthalene	mg/kg	0.05	190		1.9	5.7	1.3	1.4	0.1	0.48	0.85	0.89	2.1	0.05	0.34	2	0.05	0.62	0.73	1.4	2.1	0.71	0.47	0.61	0.75	1	5	0.63	10
Acenaphthylene	mg/kg	0.05	83000		0.34	0.28	0.05	0.14	0.05	0.05	0.41	0.05	0.29	0.05	0.05	0.23	0.05	0.05	0.05	0.33	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.44	
Acenaphthene	mg/kg	0.05	84000		6	2.6	1.7	3.1	0.05	0.84	8.4	0.99	10	0.05	0.05	4.6	0.05	0.51	0.84	4.1	2.2	0.82							

SOM 1%			Assessment Criteria		TP113	TP114	TP115	TP116	TP118	TP119	TP120	CP01	CP02A	CP02A	CP05	CP05	TP01	TP01	TP11	TP04	TP10	TP09	TP08	TP08	TP05	TP05	TP06	TP06	TP02	CP03
Analyte	Units	LOD	Commercial	3.00	1.00	2.00	1.80	2.00	1.00	1.50	7.00	4.50	7.00	4.20	9.50	1.90	3.40	2.50	3.30	3.30	3.80	2.30	3.20	1.00	2.40	2.00	3.10	3.50	4.80	
Stones Content	%		-																											
Arsenic*	mg/kg	1	640	15	25	13	15	14				9.6	12.3	7.1	8.4	9.1	9.6	16.6	6.3	4.7	9.4	18.6	9.6	6.7	5.6	7.3	9.4	32.4	9.3	6.7
Cadmium*	mg/kg	0.2	190	3.9	34	3	14	6.7				0.4	9.9	1.9	0.4	1.9	12.2	1.3	6.8	0.9	0.6	0.1	29.6	12.1	0.1	6.1	28.6	9.2	1.4	9.1
Chromium Trivalent	mg/kg	1	8600	32	100																									
Chromium Hexavalent*	mg/kg	1.2	33	1.2	1.2	1.2	1.2	1.2				0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Copper	mg/kg	1	68000	300	2400	98	420	300				17	170	52	17	38	138	77	29	14	103	87	395	630	11	145	589	3521	100	328
Lead*	mg/kg	1	2300	570	1100	160	730	380				167	168	104	89	110	108	181	306	23	134	47	1033	408	30	217	1051	533	110	253
Mercury	mg/kg	0.3	1100	0.3	0.3	0.5	0.3	0.4				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.6	0.9	0.5	0.1	0.1	1.5	0.4	0.1	0.3
Nickel	mg/kg	1	980	27	97	22	88	27				17.9	45.1	21.7	13.9	30.8	95.2	26.4	11.2	12.5	29.8	114.2	378	41.4	15.4	24.7	51.1	440.3	30.3	32.7
Selenium	mg/kg	1	12000									1	1	1	1	1	4	1	1	1	1	1	3	1	1	1	4	3	1	2
Zinc	mg/kg	1	730000	670	5200	560	1700	710				92	517	169	214	678	516	243	227	49	187	181	2837	2366	53	691	2835	2404	431	1088
Beryllium	mg/kg	0.5	12									1	0.9	0.8	0.8	1.2	1	1.3	0.5	0.6	1.7	2.6	1.3	1.5	0.7	0.8	1.9	2.7	0.9	1.1
Boron	mg/kg		240000																											
Vanadium	mg/kg		9000									50	31	74	34	41	37	42	24	22	15	2.7	18	17	33	23	23	42	93	22
Cyanide (Total)	mg/kg		-																											
Organic matter	mg/kg		-																											
Phenol, Total	mg/kg	0.2	440	0.2	0.2	0.2			0.2			0.03	0.01	0.01	0.01	1.82	0.38	0.04	0.04	3.23	0.1	0.04	0.05	0.04	0.01	0.01	0.01	0.01	0.01	0.08
Sulphate (Total) as SO4	mg/l		-									150	410	399	287	370	286	240	231	195	278	782	579	2						

TABLE SUMMARISING SOIL RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE SOIL ASSESSMENT CRITERIA
HAVANT WRP - LP72 (LANDFILL WASTE ONLY)

SOM 1%			Strata		LANDFILL	LANDFILL	LANDFILL	LANDFILL	LANDFILL	LF	LF	LF	LF																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															</
--------	--	--	--------	--	----------	----------	----------	----------	----------	----	----	----	----	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----

Assessment Criteria are the Suitable for Use Levels (S4ULs) published by LQM/CEH (Copyright Land Quality Management Ltd)
This is a summary table and it is possible that not all analytical results are reproduced. Whilst we endeavour to present the data,
Land-use Scenarios - RwhP = Residential with Home Grown Produce, RwoHP = Residential without Home Grown Produce, P
LOD = Limit of Detection. Results in italics are equal to or less than the LOD
This table should be read in conjunction with the accompanying guide on the selection of evaluation criteria and the project specification

TABLE SUMMARISING SOIL RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE SOIL ASSESSMENT CRITERIA
HAVANT WRP - LP72 (NATURAL SOILS ONLY)

SOM 1%			Strata	RTD / RMD	CHALK	CHALK	CHALK	CHALK	CHALK	CHALK	ALV	ALV								
			Assessment Criteria	RO102	RO103	RO105	RO109	CP01	CP02A	CP03	BHW001	BHW002								
Analyte	Units	LOD	Commercial	9.00	13.50	11.00	11.00	15.00	20.00	24.00	12.40	9.60								
Stones Content	%		-																	
Arsenic*	mg/kg	1	640	14		4.2	4.7	1.5	0.8	0.5	2.3	2.6								
Cadmium*	mg/kg	0.2	190	0.2		0.3	0.9	0.3	0.3	0.3	0.2	0.2								
Chromium Trivalent	mg/kg	1	8600																	
Chromium Hexavalent*	mg/kg	1.2	33	1.2		1.2	1.2	0.3	0.3	0.3	0.1	0.2								
Copper	mg/kg	1	68000	23		15	14	2	2	3	9.6	10.2								
Lead*	mg/kg	1	2300	12		6.6	20	5	5	6	2.7	884.1								
Mercury	mg/kg	0.3	1100	0.3		0.3	0.3	0.1	0.1	0.1	0.5	0.5								
Nickel	mg/kg	1	980	33		15	10	5.5	3.2	0.1	19.2	10.9								
Selenium	mg/kg	1	12000					1	1	1	0.5	0.5								
Zinc	mg/kg	1	730000	42		37	170	15	9	15	16	17.2								
Beryllium	mg/kg	0.5	12					0.5	0.5	0.5										
Boron	mg/kg		240000								0.5	1								
Vanadium	mg/kg		9000					5	2	4										
Cyanide (Total)	mg/kg		-								0.5	0.6								
Organic matter	mg/kg		-								0.25	0.74								
Phenol, Total	mg/kg	0.2	440					0.01	0.01	0.01	0.4	0.44								
Sulphate (Total) as SO4	mg/l		-					23	44	21	116	259								
pH	pH Units		-					8.6	8.49	8.59	9.2	10.2								
>C5 to C6 Aliphatic	mg/kg	0.001	3200		0.001			0.1	0.1	0.1										
>C6 to C8 Aliphatic	mg/kg	0.001	7800		0.001			0.1	0.1	0.1										
>C8 to C10 Aliphatic	mg/kg	0.001	2000		0.001			0.1	0.1	0.1										
>C10 to C12 Aliphatic	mg/kg	1	9700		1			0.2	0.2	0.2										
>C12 to C16 Aliphatic	mg/kg	2	59000		2			4	4	4										
>C16 to C21 Aliphatic	mg/kg	8	-		8			7	7	7										
>C21 to C35 Aliphatic	mg/kg	8	-		25			7	7	7										
>C16 to C35 Aliphatic	mg/kg	16	1600000		33			14	14	14										
>C35 to C44 Aliphatic	mg/kg		1600000					7	7	7										
Total Aliphatic C5-C35	mg/kg	10	-		26			26	26	26										
>C5 to C7 Aromatic	mg/kg	0.001	26000		0.001			0.1	0.1	0.1										
>C7 to C8 Aromatic	mg/kg	0.001	56000		0.001			0.1	0.1	0.1										
>C8 to C10 Aromatic	mg/kg	0.001	3500		0.001			0.1	0.1	0.1										
>C10 to C12 Aromatic	mg/kg	1	16000		1			0.2	0.2	0.2										
>C12 to C16 Aromatic	mg/kg	2	36000		2			4	4	4										
>C16 to C21 Aromatic	mg/kg	10	28000		10			7	7	7										
>C21 to C35 Aromatic	mg/kg	10	28000		10			7	7	7										
>C35 to C44 Aromatic	mg/kg		28000					7	7	7										
Total Aromatic C5-C35	mg/kg		-					26	26	26										
TPH Ali/Aro	mg/kg		-					52	52	52	15.5	66.4								
EPH (C10-C40)	mg/kg		-																	
Hazard Index - Commercial	-	-	-		0.001			0.001	0.001	0.001										
Hazard Index - Commercial	-	-	-		0.001			0.001	0.001	0.001										
Hazard Index - Commercial	-	-	-		0.001			0.001	0.001	0.001										
Benzene*	mg/kg	0.001	27		0.001			0.005	0.005	0.005	0.001	0.001								
Ethylbenzene	mg/kg	0.001	5700		0.001			0.005	0.005	0.005	0.002	0.002								
Toluene	mg/kg	0.001	56000		0.001			0.005	0.005	0.005	0.005	0.006								
Xylene	mg/kg		6600																	
M- & P-Xylene	mg/kg	0.001	-		0.001			0.005	0.005	0.005	0.004	0.005								
O-Xylene	mg/kg	0.001	-		0.001			0.005	0.005	0.005	0.002	0.002								
Total Xylene (M, P & O)	mg/kg	0.002	6600		0.002			0.01	0.01	0.01										
MTBE	mg/kg	0.001	-		0.001			0.005	0.005	0.005										
Naphthalene	mg/kg	0.05	190	0.05		0.05	0.05	0.04	0.04	0.04	0.09	0.09								
Acenaphthylene	mg/kg	0.05	83000	0.05		0.05	0.05	0.03	0.03	0.03	0.09	0.09								
Acenaphthene	mg/kg	0.05	84000	0.05		0.05	0.05	0.05	0.05	0.05	0.09	0.09								
Fluorene	mg/kg	0.05	63000	0.05		0.05	0.05	0.04	0.04	0.04	0.09	0.09								
Phenanthrene	mg/kg	0.05	22000	0.05		0.05	0.05	0.03	0.03	0.03	0.09	0.09								
Anthracene	mg/kg	0.05	520000	0.05		0.05	0.05	0.04	0.04	0.04	0.09	0.09								
Fluoranthene	mg/kg	0.05	23000	0.05		0.05	0.05	0.03	0.03	0.03	0.09	0.09								
Pyrene	mg/kg	0.05	54000	0.05		0.05	0.05	0.03	0.03	0.03	0.09	0.09								
Benzo(a)anthracene	mg/kg	0.05	170	0.05		0.05	0.05	0.06	0.06	0.06	0.09	0.09								
Chrysene	mg/kg	0.05	350	0.05		0.05	0.05	0.02	0.02	0.02	0.09	0.09								
Benzo(b)fluoranthene	mg/kg	0.05	44	0.05		0.05	0.05	0.05	0.05	0.05	0.09	0.09								
Benzo(k)fluoranthene	mg/kg	0.05	1200	0.05		0.05	0.05	0.02	0.02	0.02	0.09	0.09								
Benzo(a)pyrene (BaP)	mg/kg	0.05	35	0.05		0.05	0.05	0.04	0.04	0.04	0.09	0.09								
Indeno(1,2,3-c,d)pyrene	mg/kg	0.05	500	0.05		0.05	0.05	0.04	0.04	0.04	0.09	0.09								
Dibenzo(a,h)anthracene	mg/kg	0.05	3.5	0.05		0.05	0.05	0.04	0.04	0.04	0.09	0.09								
Benzo(g,h,i)perylene	mg/kg	0.05	3900	0.05		0.05	0.05	0.04	0.04	0.04	0.09	0.09								
Total PAH	mg/kg	0.8	-	0.8		0.8	0.8	0.6	0.6	0.6	1.38	1.38								
Coal Tar (BaP as surrogate)	mg/kg	0.05	15	0.05		0.05	0.05													
BaP* (as surrogate for PAH)	mg/kg	0.05	77	0.05		0.05	0.05													
PCB (sum of x Aroclors)	mg/kg	0.3	-																	
1,2 Dichloroethane	mg/kg	0.001	270																	
1,1,1 Trichloroethane (TCA)	mg/kg	0.001	660																	
1,1,1,2 Tetrachloroethane	mg/kg	0.001	110																	
1,1,2,2 Tetrachloroethane	mg/kg	0.001	270																	
Tetrachloroethene (PCE)*	mg/kg	0.001	24																	
Carbon Tetrachloride	mg/kg		2.9																	
Trichloroethene (TCE)*	mg/kg	0.001	0.73																	
Trichloromethane (Chloroform)	mg/kg	0.001	99																	
Vinyl Chloride (Chloroethene)*	mg/kg	0.001	1.1																	
Asbestos (Presence of)	TEXT		-					Not-detected	Not-detected	Not-detected	Not-detected	Not-detected								
Asbestos Analysis Comments	TEXT		-																	
Asbestos Fibre Count	%																			

Assessment Criteria are the Suitable for Use Levels (S4ULs) published by LQM/ClEH (Copyright Land Quality Management Limited Reproduced with Permission; Publication Number S4UL3202. All Rights Reserved) unless the analyte is marked with *. Analytes identified with * the Assessment Criteria are Category 4 Screening Levels (C4SL).

This is a summary table and it is possible that not all analytical results are reproduced. Whilst we endeavour to present the data accurately errors can occur during transcribing. The laboratory certificate should be referred to as the authenticated and complete source of results

Land-use Scenarios - RwhHP = Residential with Home Grown Produce, RwoHP = Residential without Home Grown Produce, POSresi = Public Open Space within residential, POSpark = Public Open Space not associated with residential

LOD = Limit of Detection. Results in italics are equal to or less than the LOD

This table should be read in conjunction with the accompanying guide on the selection of evaluation criteria and the project specific note presenting the justification for selection.

Appendix I Geo-Environmental Laboratory Analyses (Groundwater and Landfill Leachate) – Summary Tables

TABLE SUMMARISING WATER RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE WATER ASSESSMENT CRITERIA
HAVANT WRP - LP72 (I.1 - ALL GROUNDWATER / LEACHATE SAMPLES)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			CP02A @ 8.5	CP02A @ 9.0	CP02A @ 9.0	CP02A @ 17.0	CP02A @ 18.0	CP03 @ 5.0	CP03 @ 8.0	CP03 @ 8.0	CP03 @ 8.0	CP05 @ 8.0	CP05 @ 8.50	CP05 @ 8.70	CP05 @ 9.00	DS101 @ 9.50	DS101 @ 9.75	DS101 @ 11.20	DS101 @ 14.95	DS102 @ 11.00	DS102 @ 11.00	DS102 @ 11.20	
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	23/03/2021	20/04/2021	04/05/2021	04/05/2021	19/05/2021	20/04/2021	23/03/2021	04/05/2021	19/05/2021	04/05/2021	20/04/2021	23/03/2021	18/05/2021	20/04/2021	19/05/2021	23/03/2021	04/05/2021	20/04/2021	04/05/2021	23/03/2021	
Alkalinity as CaCO ₃	µg/l		-	-	81	0.28	16.2				3.72	4.15	4.46	7.39	5.54	1.71	1.46	1.8	2.18	0.91	1.1	3.33	1.57	5.06	3.21	2.92	6.54	7.4	9.26	16.2	
Arsenic	µg/l	0.15	-	25	81	0.28	16.2																								
Boron	µg/l		-	-	5	10	520																								
Cadmium	µg/l	0.02	0.1	0.2	81	0.02	0.06				0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	
Chromium (Total)	µg/l	0.2	-	-	81	1	16				12	11	6	6.4	9.9	10	13	6.8	10	6	6.2	15	10	5.6	9.3	12	8	4.7	8.8	13	
Chromium Trivalent	µg/l		-	-	5	3	3																								
Chromium Hexavalant	µg/l	5	-	0.6	81	3	5		81	81	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Copper	µg/l	0.5	-	3.76	81	0.5	37		56	56	2.4	5.6	6.3	11	16	3	1.7	3.3	8.9	6	9	1.4	9.9	4.6	5.1	1.5	8.7	8.9	8.4	7	
Iron	µg/l		-	1000	4	10	3450		1	1																					
Lead	µg/l	0.2	-	1.3	81	0.2	19		3	3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	
Mercury	µg/l	0.05	0.01	0.07	81	0.03	0.87	81	6	6	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
Manganese	µg/l		-	-	5	2	2020																								
Nickel	µg/l	0.5	-	8.6	81	1	130		58	58	16	11	13	8.4	17	3	4.1	6.1	7	6.7	4.1	29	20	23	27	15	33	6.9	19	130	
Selenium	µg/l		-	-	5	1	1																								
Zinc	µg/l	0.5	-	6.8	81	0.5	540		35	35	16	6.9	10	4.8	8.7	3.9	7.1	1.2	16	27	1.8	9.4	12	3.2	2.6	2.9	5	2	2.3	5.4	
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-	16	27	240000																								
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	75	15	250000		74	74	45000	46000	69000	66000	95000	26000	26000	20000	23000	69000		55000	100000	85000	86000	87000	63000	150000	150000	170000	
Chloride	µg/l	150	-	-	80	19000	2900000				160000	580000	570000	650000	810000	170000	150000	150000	170000	140000		96000	230000	480000	510000	340000	460000	2900000	2600000	2100000	
Chlorine	µg/l		-	10																											
Cyanide	µg/l		-	1	5	20	20		5	5																					
Nitrate as NO ₃	µg/l	50	-	-	78	110	77800				520	11800	3320	1450	1100	1560	780	360	110	670		520	1000	1190	370	730	780	2900	1820	1920	
Nitrite as NO ₂	µg/l	5	-	-	78	5	5300				5	380	33	100	9.2	5	21	5	5	5		5	5	5	5	43	5	5	5	66	
Phenol	µg/l	0.05	-	7.7	14	0.05	2					0.05				0.05							0.05							0.05	
Pentachlorophenol	µg/l		0.1	0.4																											
PCBs	µg/l		0.001	-																											
Sodium	µg/l		-	-																											
Sulphate	µg/l	45	-	-	81	3940	217000				30800	47300	38600	44900	39600	8090	11100	6070	3940	6390	7630	11300	4490	9950	4900	17600	6310	12800	10800	23800	
pH	pH Units		-	-	81	6.7	7.5				6.9	7	6.9	6.9	6.8	6.7	6.8	6.8	6.8	6.8	6.7	6.7	6.9	6.9	6.9	6.9	7	6.9	6.8	6.8	7.1
Dichloromethane	µg/l		-	20																											
1,2 Dichloroethane	µg/l	1	1	10	19	1	1					1				1								1							1
Trichloroethene (PCE)	µg/l	1	0.1	10	19	1	5	19				1				1								1							1
1,1,1 Trichloroethane	µg/l	1	0.1	-	19	1	1	19				1				1								1							1
1,1,2 Trichloroethane	µg/l	1	0.1	-	19	1	1	19				1				1								1							1
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5	19	1	5	19	5	5						1								1							1
1,2,3 Trichlorobenzene	µg/l	1	-	-	19	1	5					1				1								1							1
1,2,4 Trichlorobenzene	µg/l	1	0.01	-	19	1	5	19				1				1								1							1
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4	19	2	10	19	19			2				2								2							2
Tetrachloroethene	µg/l	1	0.1	10	19	1	5	19				1				1								1							1
Tetrachloromethane	µg/l	1	0.1	12	19	1	1	19				1				1								1							1
1,1,1,2 Tetrachloroethane	µg/l	1	-	-	19	1	1					1				1								1							1
2-chlorophenol	µg/l	0.05	0.1	-								0.05				0.05								0.05							0.05
4-chloro-3-methylphenol	µg/l		0.1	-																											
Hexachlorobutadiene	µg/l	1	0.005	0.6				14	14	14		1				1								1							1
Vinyl Chloride (Chloroethene)	µg/l	1	-	-	19	1	1					1				1								1							1
>C5 to C6 Aliphatic	µg/l	1	-	-	76	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
>C8 to C8 Aliphatic	µg/l	1	-	-	76	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
>C8 to C10 Aliphatic	µg/l	1	-	-	80	1	10				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
>C10 to C12 Aliphatic	µg/l	10	-	-	80	10	63				10	10	10	10	10	10	10	10	10	10	16	10	10	13	10	10	10	10	10	10	10
>C12 to C16 Aliphatic	µg/l	10	-	-	80	10	38				10	10	10	10	10	10	10	10	10	10	24	14	10	16	10	11	10	14	10	20	
>C16 to C21 Aliphatic	µg/l	10	-	-	80	10	43				10	10	10	10	10	10	10	10	10	10	18	11	10	10	10	10	10	10	10	32	
>C21 to C35 Aliphatic	µg/l	10	-	-	80	10	370				10	85	10	10	10	10	10	10	10	10	370	140	10	170	10	100	10	130	10	150	
>C35 to C44 Aliphatic	µg/l		-	-																											
Total Aliphatic C5-35	µg/l		-	-																											
>C5 to C7 Aromatic	µg/l	1	-	-	76	1	11				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
>C7 to C8 Aromatic	µg/l	1	-	-	76	1	6.4				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
>C8 to C10 Aromatic	µg/l	1	-	-	80	1	140				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
>C10 to C12 Aromatic	µg/l	10	-	-	80	10	1700				10	90	10	10	120	10	10	10	10	10	130	53	55	140	18	130	10	350	10	230	
>C12 to C16 Aromatic	µg/l	10	-	-	80	10	1200				10	170	10	10	290	10	10	10	10	10	200	74	140	230	64	190	10	400	10	270	
>C16 to C21 Aromatic	µg/l	10	-	-	80	10	440				10	100	10	10	250	10	10	10	10	10	99	34	150	130	55	120	10	200	10	130	
>C21 to C35 Aromatic	µ																														

TABLE SUMMARISING WATER RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE WATER ASSESSMENT CRITERIA
HAVANT WRP - LP72 (I.1 - ALL GROUNDWATER / LEACHATE SAMPLES)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			DS102 @ 11.50	DS103 @ 9.70	DS103 @ 11.00	DS103 @ 11.00	DS103 @ 11.00	RO101 @ 9.00	RO101 @ 14.30	RO101 @ 9.00	RO101 @ 15.50	RO101 @ 15.00	RO101 @ 9.50	RO101 @ 16.00	RO102 @ 9.00	RO102 @ 15.00	RO102 @ 15.00	RO102 @ 15.00	RO102 @ 15.50	RO103 @ 8.10	RO103 @ 15.90	RO103 @ 8.50		
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	19/05/2021	23/03/2021	20/04/2021	04/05/2021	19/05/2021	22/03/2021	22/03/2021	20/04/2021	20/04/2021	04/05/2021	19/05/2021	18/05/2021	22/03/2021	22/03/2021	20/04/2021	04/05/2021	18/05/2021	22/03/2021	22/03/2021	20/04/2021		
Alkalinity as CaCO ₃	µg/l		-	-	81	0.28	16.2				12.7	6.12	2.77	4.68	2.17	10.3	10.5	7.5	2.8	15.1	9.12	5.75	7.05	1.09	2.32	1.84	1.35	6.66	2.7	6.41		
Arsenic	µg/l	0.15	-	25	81	0.28	16.2				12.7	6.12	2.77	4.68	2.17	10.3	10.5	7.5	2.8	15.1	9.12	5.75	7.05	1.09	2.32	1.84	1.35	6.66	2.7	6.41		
Boron	µg/l		-	-	5	10	520																									
Cadmium	µg/l	0.02	0.1	0.2	81	0.02	0.06				0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.03	0.02	0.02	0.02		
Chromium (Total)	µg/l	0.2	-	-	81	1	16				13	9.9	7.6	6.4	11	12	16	8.1	4.6	5.9	9.7	6.6	16	4.6	7.6	5.2	7.2	12	2.7	10		
Chromium Trivalent	µg/l		-	-	5	3	3																									
Chromium Hexavalant	µg/l	5	-	0.6	81	3	5				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
Copper	µg/l	0.5	-	3.76	81	0.5	37				30	3.6	0.5	3.9	11	6.1	9.1	8.1	14	9.8	37	17	7.1	5.8	7.9	4.4	8.4	5.6	1.6	8.3		
Iron	µg/l		-	1000	4	10	3450				1	1																				
Lead	µg/l	0.2	-	1.3	81	0.2	19				3	3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.7	0.2	0.4	2.2	0.5		
Mercury	µg/l	0.05	0.01	0.07	81	0.03	0.87				81	6	6	0.05	0.19	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05		
Manganese	µg/l		-	-	5	2	2020																									
Nickel	µg/l	0.5	-	8.6	81	1	130				58	58	20	37	17	13	20	15	60	6.2	6.9	9.8	11	27	52	9.2	23	19	20	9.2	5.9	11
Selenium	µg/l		-	-	5	1	1																									
Zinc	µg/l	0.5	-	6.8	81	0.5	540				35	35	7.5	13	4.7	4.3	13	5.3	18	5.5	2.5	0.5	7.7	19	7.1	19	190	230	43	2.8	23	3.3
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-	16	27	240000																									
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	75	15	250000				74	74	190000	76000	130000	110000	140000	38000	140000	39000	73000	88000	89000	81000	250000	3400	33000	14000	41000	46000	15	110000
Chloride	µg/l	150	-	-	80	19000	2900000				1900000	460000	350000	330000	430000	250000	450000	320000	630000	770000	330000	1000000	560000	280000	310000	120000	200000	340000	170000	840000		
Chlorine	µg/l		-	10																												
Cyanide	µg/l		-	1	5	20	20				5	5																				
Nitrate as NO ₃	µg/l	50	-	-	78	110	77800				1840	730	1300	990	1210	830	1040	1820	1760	2540	2100	1310	1090	10500	3320	8710	10800	670	620	1250		
Nitrite as NO ₂	µg/l	5	-	-	78	5	5300				5	50	5	5	5	5	5	5	5	5	5	5	5	70	1800	410	5300	5	5	5		
Phenol	µg/l	0.05	-	7.7	14	0.05	2									0.05	0.05															
Pentachlorophenol	µg/l		0.1	0.4																												
PCBs	µg/l		0.001	-																												
Sodium	µg/l		-	-																												
Sulphate	µg/l	45	-	-	81	3940	217000				5980	12200	16400	15700	10100	24700	23200	28200	49700	58700	4550	110000	15300	67500	48100	38000	30200	127000	42200	6570		
pH	pH Units		-	-	81	6.7	7.5				6.8	7.1	6.9	6.9	6.8	6.8	6.9	6.9	6.9	6.8	6.8	6.8	6.8	7	6.8	6.9	7	6.7	7.2	6.8		
Dichloromethane	µg/l		-	20																												
1,2 Dichloroethane	µg/l	1	1	10	19	1	1									1	1															
Trichloroethene (PCE)	µg/l	1	0.1	10	19	1	5	19								1	1															
1,1,1 Trichloroethane	µg/l	1	0.1	-	19	1	1	19								1	1															
1,1,2 Trichloroethane	µg/l	1	0.1	-	19	1	1	19								1	1															
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5	19	1	5	19	5	5						1	1															
1,2,3 Trichlorobenzene	µg/l	1	-	-	19	1	5									1	1															
1,2,4 Trichlorobenzene	µg/l	1	0.01	-	19	1	5	19								1	1															
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4	19	2	10	19	19							2	2															
Tetrachloroethene	µg/l	1	0.1	10	19	1	5	19								1	1															
Tetrachloromethane	µg/l	1	0.1	12	19	1	1	19								1	1															
1,1,1,2 Tetrachloroethane	µg/l	1	-	-	19	1	1									1	1															
2-chlorophenol	µg/l	0.05	0.1	-												0.05	0.05															
4-chloro-3-methylphenol	µg/l		0.1	-																												
Hexachlorobutadiene	µg/l	1	0.005	0.6				14	14	14						1	1															
Vinyl Chloride (Chloroethene)	µg/l	1	-	-	19	1	1									1	1															
>C5 to C6 Aliphatic	µg/l	1	-	-	76	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C6 to C8 Aliphatic	µg/l	1	-	-	76	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aliphatic	µg/l	1	-	-	80	1	10				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C10 to C12 Aliphatic	µg/l	10	-	-	80	10	63				10	10	42	10	10	10	10	34	63	10	10	10	10	10	10	10	10	10	10	10	10	
>C12 to C16 Aliphatic	µg/l	10	-	-	80	10	38				10	10	18	10	10	11	17	21	21	10	10	10	10	10	10	10	10	10	10	10	10	
>C16 to C21 Aliphatic	µg/l	10	-	-	80	10	43				10	10	12	10	10	13	13	10	12	10	10	10	10	10	10	10	10	10	10	10	10	
>C21 to C35 Aliphatic	µg/l	10	-	-	80	10	370				10	95	190	10	10	160	130	10	160	10	10	10	10	10	10	10	10	10	10	10	10	
>C35 to C44 Aliphatic	µg/l		-	-																												
Total Aliphatic C5-35	µg/l		-	-																												
>C5 to C7 Aromatic	µg/l	1	-	-	76	1	11				1	1	1	1	1	9.1	5.9	7.1	1	1	11	1	4	1	1	1	1	1	3.9	1	4.5	
>C7 to C8 Aromatic	µg/l	1	-	-	76	1	6.4				1	1	1	1	1	6.4	6.4	4.4	1	1	4.4	1	1	1	1	1	1	1	2	1	1.8	
>C8 to C10 Aromatic	µg/l	1	-	-	80	1	140				1	1	1	1	1	33	5.8	4.8	1	1	16	1	9.2	1	1	1	1	110	1	70		
>C10 to C12 Aromatic	µg/l	10	-	-	80	10	1700				91	65	160	10	78	350	250	640	1700	10	620	64	350	10	80	10	10	490	10	480		
>C12 to C16 Aromatic	µg/l	10	-	-	80	10	1200				220	88	150	10	200	250	380	400	530	10	1200	180	430	10	140	10	10	260	10	330		
>C16 to C21 Aromatic	µg/l	10	-	-	80	10	440				150	51	67	10	170	120	150	110</														

TABLE SUMMARISING WATER RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE WATER ASSESSMENT CRITERIA
HAVANT WRP - LP72 (I.1 - ALL GROUNDWATER / LEACHATE SAMPLES)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			RO103 @ 16.00	RO103 @ 15.00	RO103 @ 8.80	RO103 @ 16.00	RO104 @ 15.20	RO104 @ 9.00	RO104 @ 16.50	RO104 @ 16.00	RO104 @ 9.75	RO104 @ 16.00	RO105 @ 9.23	RO105 @ 14.90	RO105 @ 10.00	RO105 @ 14.50	RO105 @ 15.00	RO105 @ 10.00	RO105 @ 15.50	RO106 @ 12.30	RO106 @ 16.60	RO106 @ 12.50		
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	20/04/2021	04/05/2021	19/05/2021	19/05/2021	23/03/2021	20/04/2021	20/04/2021	04/05/2021	19/05/2021	19/05/2021	23/03/2021	23/03/2021	20/04/2021	20/04/2021	04/05/2021	19/05/2021	19/05/2021	23/03/2021	23/03/2021	20/04/2021		
Alkalinity as CaCO ₃	µg/l		-	-	81	0.28	16.2				5.52	2.6	10.5	1.29	1.52	5.88	1.71	0.66	12	0.28	1.06	0.65	1.57	5.13	7.74	0.49	6.05	3.24	4.41	1.44		
Arsenic	µg/l	0.15	-	25	81	0.28	16.2				5.52	2.6	10.5	1.29	1.52	5.88	1.71	0.66	12	0.28	1.06	0.65	1.57	5.13	7.74	0.49	6.05	3.24	4.41	1.44		
Boron	µg/l		-	-	5	10	520																									
Cadmium	µg/l	0.02	0.1	0.2	81	0.02	0.06				0.02	0.02	0.03	0.02	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		
Chromium (Total)	µg/l	0.2	-	-	81	1	16				2.4	2.1	8.2	2.9	3.1	7.6	10	1.9	11	2.4	14	6.6	11	9.6	5.8	9	6.5	14	5.5	5		
Chromium Trivalent	µg/l		-	-	5	3	3																									
Chromium Hexavalant	µg/l	5	-	0.6	81	3	5		81	81	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
Copper	µg/l	0.5	-	3.76	81	0.5	37		56	56	12	1.1	18	5.7	2.3	13	11	0.6	23	2.7	1.6	3.4	8.5	9.4	1.7	8.5	2.8	2.7	3.2	13		
Iron	µg/l		-	1000	4	10	3450		1	1																						
Lead	µg/l	0.2	-	1.3	81	0.2	19		3	3	0.2	0.2	0.2	0.2	19	0.3	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.2	0.2		
Mercury	µg/l	0.05	0.01	0.07	81	0.03	0.87	81	6	6	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		
Manganese	µg/l		-	-	5	2	2020																									
Nickel	µg/l	0.5	-	8.6	81	1	130		58	58	5.1	5.3	13	5.1	5	9.1	8.7	3.9	25	3.8	7.8	34	7.6	19	10	10	14	10	20	3.8		
Selenium	µg/l		-	-	5	1	1																									
Zinc	µg/l	0.5	-	6.8	81	0.5	540		35	35	3.1	4.7	38	8.6	34	4.8	4.4	5.5	13	7.5	5.4	41	4.5	3.4	1.7	26	5.5	6.5	540	0.5		
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-	16	27	240000																									
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	75	15	250000		74	74	120	26	120000	100	140	180000	44	120	190000	85	78000	28000	65000	44000	27000	74000	25000	220000	17000	180000		
Chloride	µg/l	150	-	-	80	19000	2900000				140000	71000	750000	63000	110000	420000	32000	28000	410000	28000	170000	91000	200000	160000	100000	150000	86000	510000	420000	500000		
Chlorine	µg/l		-	10																												
Cyanide	µg/l		-	1	5	20	20		5	5																						
Nitrate as NO ₃	µg/l	50	-	-	78	110	77800				310	2390	53600	77800	8400	1040	3010	21300	1520	23200	520	10700	830	1400	360	1310	680	990	930	1450		
Nitrite as NO ₂	µg/l	5	-	-	78	5	5300				5	290	5	400	110	5	230	120	5	60	16	4500	5	5	5	5	5	5	28	5		
Phenol	µg/l	0.05	-	7.7	14	0.05	2									2						0.05						0.05				
Pentachlorophenol	µg/l		0.1	0.4																												
PCBs	µg/l		0.001	-																												
Sodium	µg/l		-	-																												
Sulphate	µg/l	45	-	-	81	3940	217000				27800	13000	6490	9130	73900	6420	27200	25500	5830	22200	17800	39300	10900	4760	15200	5750	13600	9270	97500	9740		
pH	pH Units		-	-	81	6.7	7.5				7.3	7.3	6.9	7.4	7.4	7	7.3	7.2	6.9	7.4	6.8	7	6.9	6.9	7	7	7	6.9	7.2	6.9		
Dichloromethane	µg/l		-	20																												
1,2 Dichloroethane	µg/l	1	1	10	19	1	1									1							1						1			
Trichloroethene (PCE)	µg/l	1	0.1	10	19	1	5	19								1							1						1			
1,1,1 Trichloroethane	µg/l	1	0.1	-	19	1	1	19								1							1						1			
1,1,2 Trichloroethane	µg/l	1	0.1	-	19	1	1	19								1							1						1			
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5	19	1	5	19	5	5						1						1						1				
1,2,3 Trichlorobenzene	µg/l	1	-	-	19	1	5									1						1						1				
1,2,4 Trichlorobenzene	µg/l	1	0.01	-	19	1	5	19								1						1						1				
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4	19	2	10	19	19	19						2						2						2				
Tetrachloroethene	µg/l	1	0.1	10	19	1	5	19								1						1						1				
Tetrachloromethane	µg/l	1	0.1	12	19	1	1	19								1						1						1				
1,1,1,2 Tetrachloroethane	µg/l	1	-	-	19	1	1									1						1						1				
2-chlorophenol	µg/l	0.05	0.1	-												0.05						0.05						0.05				
4-chloro-3-methylphenol	µg/l		0.1	-																												
Hexachlorobutadiene	µg/l	1	0.005	0.6				14	14	14						1						1						1				
Vinyl Chloride (Chloroethene)	µg/l	1	-	-	19	1	1									1						1						1				
>C5 to C6 Aliphatic	µg/l	1	-	-	76	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C6 to C8 Aliphatic	µg/l	1	-	-	76	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aliphatic	µg/l	1	-	-	80	1	10				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C10 to C12 Aliphatic	µg/l	10	-	-	80	10	63				10	10	10	10	13	19	10	10	10	10	10	10	10	10	10	10	10	10	19	10	10	
>C12 to C16 Aliphatic	µg/l	10	-	-	80	10	38				10	10	10	10	21	18	10	10	10	10	10	10	10	10	10	10	10	10	38	10	13	
>C16 to C21 Aliphatic	µg/l	10	-	-	80	10	43				10	10	10	10	26	13	10	10	10	10	10	10	10	10	10	10	10	10	31	10	10	
>C21 to C35 Aliphatic	µg/l	10	-	-	80	10	370				10	10	10	10	160	220	10	10	10	10	10	10	100	10	10	10	10	10	340	10	10	
>C35 to C44 Aliphatic	µg/l		-	-																												
Total Aliphatic C5-35	µg/l		-	-																												
>C5 to C7 Aromatic	µg/l	1	-	-	76	1	11				1	1	5.6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.9	1	1	
>C7 to C8 Aromatic	µg/l	1	-	-	76	1	6.4				1	1	2.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aromatic	µg/l	1	-	-	80	1	140				1	1	140	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.2	1	1	
>C10 to C12 Aromatic	µg/l	10	-	-	80	10	1700				10	10	270	10	55	320	10	10	72	10	95	10	120	10	10	10	10	24	10	370	10	160
>C12 to C16 Aromatic	µg/l	10	-	-	80	10	1200				10	10	290	10	110	380	10	10	150	10	130	10	170	10	10	10	10	64	10	530	10	250
>C16 to C21 Aromatic	µg/l	10	-	-	80	10	440				10	10	230	10	99																	

HAVANT WRP - LP72 (I.1 - ALL GROUNDWATER / LEACHATE SAMPLES)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			RO106 @ 16.00	RO106 @ 17.00	RO106 @ 17.00	RO106 @ 18.00	RO107 @ 14.80	RO107 @ 15.00	RO107 @ 15.00	RO108 @13.10	RO108 @ 13.00	RO108 @ 14.00	RO108 @13.25	RO109 @ 14.00	RO109 @ 14.50	RO109 @ 14.50	RO109 @ 14.50	BHRP01	BHRP02	BHW001	BHW002
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	20/04/2021	04/05/2021	19/05/2021	19/05/2021	23/03/2021	20/04/2021	05/05/2021	18/05/2021	23/03/2021	20/04/2021	04/05/2021	18/05/2021	04/05/2021	23/03/2021	20/04/2021	19/05/2021	16/02/2023	16/02/2023	16/02/2023
Alkalinity as CaCO ₃	µg/l		-	-																									
Arsenic	µg/l	0.15	-	25	81	0.28	16.2																						
Boron	µg/l		-	-	5	10	520																						
Cadmium	µg/l	0.02	0.1	0.2	81	0.02	0.06																						
Chromium (Total)	µg/l	0.2	-	-	81	1	16																						
Chromium Trivalent	µg/l		-	-	5	3	3																						
Chromium Hexavalant	µg/l	5	-	0.6	81	3	5																						
Copper	µg/l	0.5	-	3.76	81	0.5	37																						
Iron	µg/l		-	1000	4	10	3450																						
Lead	µg/l	0.2	-	1.3	81	0.2	19																						
Mercury	µg/l	0.05	0.01	0.07	81	0.03	0.87	81	6	6																			
Manganese	µg/l		-	-	5	2	2020																						
Nickel	µg/l	0.5	-	8.6	81	1	130																						
Selenium	µg/l		-	-	5	1	1																						
Zinc	µg/l	0.5	-	6.8	81	0.5	540																						
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-	16	27	240000																						
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	75	15	250000																						
Chloride	µg/l	150	-	-	80	19000	2900000																						
Chlorine	µg/l		-	10																									
Cyanide	µg/l		-	1	5	20	20																						
Nitrate as NO ₃	µg/l	50	-	-	78	110	77800																						
Nitrite as NO ₂	µg/l	5	-	-	78	5	5300																						
Phenol	µg/l	0.05	-	7.7	14	0.05	2																						
Pentachlorophenol	µg/l		0.1	0.4																									
PCBs	µg/l		0.001	-																									
Sodium	µg/l		-	-																									
Sulphate	µg/l	45	-	-	81	3940	217000																						
pH	pH Units		-	-	81	6.7	7.5																						
Dichloromethane	µg/l		-	20																									
1,2 Dichloroethane	µg/l	1	1	10	19	1	1																						
Trichloroethene (PCE)	µg/l	1	0.1	10	19	1	5	19																					
1,1,1 Trichloroethane	µg/l	1	0.1	-	19	1	1	19																					
1,1,2 Trichloroethane	µg/l	1	0.1	-	19	1	1	19																					
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5	19	1	5	19	5	5																			
1,2,3 Trichlorobenzene	µg/l	1	-	-	19	1	5																						
1,2,4 Trichlorobenzene	µg/l	1	0.01	-	19	1	5	19																					
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4	19	2	10		19	19																			
Tetrachloroethene	µg/l	1	0.1	10	19	1	5	19																					
Tetrachloromethane	µg/l	1	0.1	12	19	1	1	19																					
1,1,1,2 Tetrachloroethane	µg/l	1	-	-	19	1	1																						
2-chlorophenol	µg/l	0.05	0.1	-																									
4-chloro-3-methylphenol	µg/l		0.1	-																									
Hexachlorobutadiene	µg/l	1	0.005	0.6				14	14	14																			
Vinyl Chloride (Chloroethene)	µg/l	1	-	-																									
>C5 to C6 Aliphatic	µg/l	1	-	-	76	1	1																						
>C6 to C8 Aliphatic	µg/l	1	-	-	76	1	1																						
>C8 to C10 Aliphatic	µg/l	1	-	-	80	1	10																						
>C10 to C12 Aliphatic	µg/l	10	-	-	80	10	63																						
>C12 to C16 Aliphatic	µg/l	10	-	-	80	10	38																						
>C16 to C21 Aliphatic	µg/l	10	-	-	80	10	43																						
>C21 to C35 Aliphatic	µg/l	10	-	-	80	10	370																						
>C35 to C44 Aliphatic	µg/l		-	-																									
Total Aliphatic C5-35	µg/l		-	-																									
>C5 to C7 Aromatic	µg/l	1	-	-	76	1	11																						
>C7 to C8 Aromatic	µg/l	1	-	-	76	1	6.4																						
>C8 to C10 Aromatic	µg/l	1	-	-	80	1	140																						
>C10 to C12 Aromatic	µg/l	10	-	-	80	10	1700																						
>C12 to C16 Aromatic	µg/l	10	-	-	80	10	1200																						
>C16 to C21 Aromatic	µg/l	10	-	-	80	10	440																						
>C21 to C35 Aromatic	µg/l	10	-	-	80	10	810																						
>C35 to C44 Aromatic	µg/l		-	-																									
Total Aromatic C5-C35	µg/l		-	-																									
TPH Ali/Aro	µg/l		-	-																									
Benzene	µg/l	1	1	8	81	1	10.5	7	2	2																			
Ethylbenzene	µg/l	1	-	-	81	0.5	30.5																						
Toluene	µg/l	1	4	74	81	1	6.4	4																					
Xylene	µg/l		3	30																									
M- & P-Xylene	µg/l	1	-	-	81	1	60.7																						
O-Xylene	µg/l	1	-	-	81	1	9																						
Total Xylene (M, P & O)	µg/l	2		30	77		2																						
MTBE	µg/l	1	-	-	81	1	1																						
naphthalene	µg/l	0.01	-	2	81	0.01	14.8	10	10																				
acenaphthylene	µg/l	0.01	-	-	81	0.01	0.01																						
acenaphthene	µg/l	0.01	-	-	81	0.01	6.81																						
fluorene	µg/l	0.01	-	-	81	0.01	2.9																						
phenanthrene	µg/l	0.01	-	-	81	0.01	3.9																						
anthracene	µg/l	0.01	-	0.1	81	0.01	0.69	6	6																				
fluoranthene	µg/l	0.01	-	0.0063	81	0.01	1.3	81	81														</						

TABLE SUMMARISING WATER RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE WATER ASSESSMENT CRITERIA
HAVANT WRP - LP72 (I.1 - ALL GROUNDWATER / LEACHATE SAMPLES)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			BHW003
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	16/02/2023
Alkalinity as CaCO ₃	µg/l		-	-							
Arsenic	µg/l	0.15	-	25	81	0.28	16.2				1
Boron	µg/l		-	-	5	10	520				30
Cadmium	µg/l	0.02	0.1	0.2	81	0.02	0.06				0.02
Chromium (Total)	µg/l	0.2	-	-	81	1	16				1
Chromium Trivalent	µg/l		-	-	5	3	3				3
Chromium Hexavalant	µg/l	5	-	0.6	81	3	5	81	81		3
Copper	µg/l	0.5	-	3.76	81	0.5	37	56	56		1
Iron	µg/l		-	1000	4	10	3450	1	1		790
Lead	µg/l	0.2	-	1.3	81	0.2	19	3	3		1
Mercury	µg/l	0.05	0.01	0.07	81	0.03	0.87	81	6	6	0.03
Manganese	µg/l		-	-	5	2	2020				646
Nickel	µg/l	0.5	-	8.6	81	1	130	58	58		9
Selenium	µg/l		-	-	5	1	1				1
Zinc	µg/l	0.5	-	6.8	81	0.5	540	35	35		3
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-	16	27	240000				
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	75	15	250000	74	74		
Chloride	µg/l	150	-	-	80	19000	2900000				43000
Chlorine	µg/l		-	10							
Cyanide	µg/l		-	1	5	20	20	5	5		20
Nitrate as NO ₃	µg/l	50	-	-	78	110	77800				24800
Nitrite as NO ₂	µg/l	5	-	-	78	5	5300				40
Phenol	µg/l	0.05		7.7	14	0.05	2				
Pentachlorophenol	µg/l		0.1	0.4							
PCBs	µg/l		0.001	-							
Sodium	µg/l		-	-							
Sulphate	µg/l	45	-	-	81	3940	217000				10000
pH	pH Units		-	-	81	6.7	7.5				7.5
Dichloromethane	µg/l		-	20							
1,2 Dichloroethane	µg/l	1	1	10	19	1	1				1
Trichloroethene (PCE)	µg/l	1	0.1	10	19	1	5	19			5
1,1,1 Trichloroethane	µg/l	1	0.1	-	19	1	1	19			1
1,1,2 Trichloroethane	µg/l	1	0.1	-	19	1	1	19			1
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5	19	1	5	19	5	5	5
1,2,3 Trichlorobenzene	µg/l	1		-	19	1	5				5
1,2,4 Trichlorobenzene	µg/l	1	0.01	-	19	1	5	19			5
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4	19	2	10	19	19		10
Tetrachloroethene	µg/l	1	0.1	10	19	1	5	19			5
Tetrachloromethane	µg/l	1	0.1	12	19	1	1	19			1
1,1,1,2 Tetrachloroethane	µg/l	1	-	-	19	1	1				1
2-chlorophenol	µg/l	0.05	0.1	-							
4-chloro-3-methylphenol	µg/l		0.1	-							
Hexachlorobutadiene	µg/l	1	0.005	0.6				14	14	14	
Vinyl Chloride (Chloroethene)	µg/l	1	-	-	19	1	1				1
>C5 to C6 Aliphatic	µg/l	1	-	-	76	1	1				
>C6 to C8 Aliphatic	µg/l	1	-	-	76	1	1				
>C8 to C10 Aliphatic	µg/l	1	-	-	80	1	10				10
>C10 to C12 Aliphatic	µg/l	10	-	-	80	10	63				10
>C12 to C16 Aliphatic	µg/l	10	-	-	80	10	38				10
>C16 to C21 Aliphatic	µg/l	10	-	-	80	10	43				10
>C21 to C35 Aliphatic	µg/l	10	-	-	80	10	370				10
>C35 to C44 Aliphatic	µg/l		-	-							
Total Aliphatic C5-35	µg/l		-	-							
>C5 to C7 Aromatic	µg/l	1	-	-	76	1	11				
>C7 to C8 Aromatic	µg/l	1	-	-	76	1	6.4				
>C8 to C10 Aromatic	µg/l	1	-	-	80	1	140				10
>C10 to C12 Aromatic	µg/l	10	-	-	80	10	1700				10
>C12 to C16 Aromatic	µg/l	10	-	-	80	10	1200				10
>C16 to C21 Aromatic	µg/l	10	-	-	80	10	440				10
>C21 to C35 Aromatic	µg/l	10	-	-	80	10	810				10
>C35 to C44 Aromatic	µg/l		-	-							
Total Aromatic C5-C35	µg/l		-	-							
TPH Ali/Aro	µg/l		-	-							
Benzene	µg/l	1	1	8	81	1	10.5	7	2	2	1
Ethylbenzene	µg/l	1	-	-	81	0.5	30.5				0.5
Toluene	µg/l	1	4	74	81	1	6.4	4			1
Xylene	µg/l		3	30							
M- & P-Xylene	µg/l	1	-	-	81	1	60.7				1
O-Xylene	µg/l	1	-	-	81	1	9				1
Total Xylene (M, P & O)	µg/l	2	-	30	77		2				2
MTBE	µg/l	1	-	-	81	1	1				1
naphthalene	µg/l	0.01	-	2	81	0.01	14.8	10	10		0.01
acenaphthylene	µg/l	0.01	-	-	81	0.01	0.01				0.01
acenaphthene	µg/l	0.01	-	-	81	0.01	6.81				0.01
fluorene	µg/l	0.01	-	-	81	0.01	2.9				0.01
phenanthrene	µg/l	0.01	-	-	81	0.01	3.9				0.01
anthracene	µg/l	0.01	-	0.1	81	0.01	0.69	6	6		0.01
fluoranthene	µg/l	0.01	-	0.0063	81	0.01	1.3	81	81		0.01
pyrene	µg/l	0.01	-	-	81	0.01	1				0.01
benzo(a)anthracene	µg/l	0.01	-	-	81	0.01	0.36				0.01
chrysene	µg/l	0.01	-	-	81	0.01	0.28				0.01
benzo(b)fluoranthene	µg/l	0.01	-	0.017	81	0.01	0.28	1	1		0.01
benzo(k)fluoranthene	µg/l	0.01	-	0.017	81	0.01	0.01				0.01
benzo(a)pyrene	µg/l	0.01	-	0.00017	81	0.01	0.47	81	81		0.01
benzo(g,h,i)perylene	µg/l	0.01	-	0.00082	81	0.01	0.01	81	81		0.01
dibenzo(ah)anthracene	µg/l	0.01	-	-	81	0.01	0.01				0.01
indeno(1,2,3-c,d)pyrene	µg/l	0.01	-	-	81	0.01	0.01				0.01
Sum (benzo b, k, ghi & indeno123cd)	µg/l	0.04	-	-	81	0.04	0.31				0.04
Total PAH	µg/l	0.16	-	-	81	0.16	25.6				0.16

TABLE SUMMARISING WATER RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE WATER ASSESSMENT CRITERIA
HAVANT WRP - LP72 (I.2 -SUPERFICIAL DEPOSITS ONLY)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			DS101 @ 9.50	DS101 @ 9.75	DS101 @ 11.20	DS101 @ 14.95	DS102 @ 11.00	DS102 @ 11.00	DS102 @ 11.20	DS102 @ 11.50	DS103 @ 9.70	DS103 @ 11.00	DS103 @ 11.00	DS103 @ 11.00	BHW003
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	20/04/2021	19/05/2021	23/03/2021	04/05/2021	20/04/2021	04/05/2021	23/03/2021	19/05/2021	23/03/2021	20/04/2021	04/05/2021	19/05/2021	16/02/2023
Alkalinity as CaCO ₃	µg/l		-	-	13	1	16.2				5.06	3.21	2.92	6.54	7.4	9.26	16.2	12.7	6.12	2.77	4.68	2.17	1
Arsenic	µg/l	0.15	-	25	1	30	30																30
Boron	µg/l		-	-	13	0.02	0.03				0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Cadmium	µg/l	0.02	0.1	0.2	13	1	13				5.6	9.3	12	8	4.7	8.8	13	13	9.9	7.6	6.4	11	1
Chromium (Total)	µg/l	0.2	-	-	1	3	3																3
Chromium Trivalent	µg/l		-	-	13	3	5	13	13		5	5	5	5	5	5	5	5	5	5	5	5	3
Chromium Hexavalant	µg/l	5	-	0.6	13	0.5	30	9	9		4.6	5.1	1.5	8.7	8.9	8.4	7	30	3.6	0.5	3.9	11	1
Copper	µg/l	0.5	-	3.76	1	790	790																790
Iron	µg/l		-	1000	13	0.2	1				0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	1
Lead	µg/l	0.2	-	1.3	13	0.03	0.19	13	1	1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.19	0.05	0.05	0.05	0.03
Mercury	µg/l	0.05	0.01	0.07	1	646	646																646
Manganese	µg/l		-	-	13	6.9	130	12	12		23	27	15	33	6.9	19	130	20	37	17	13	20	9
Nickel	µg/l	0.5	-	8.6	1	1	1																1
Selenium	µg/l		-	-	13	2	13	3	3		3.2	2.6	2.9	5	2	2.3	5.4	7.5	13	4.7	4.3	13	3
Zinc	µg/l	0.5	-	6.8	3	66000	160000							66000		160000					120000		
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-	12	63000	190000	12	12		85000	86000	87000	63000	150000	150000	170000	190000	76000	130000	110000	140000	
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	13	43000	2900000				480000	510000	340000	460000	2900000	2600000	2100000	1900000	460000	350000	330000	430000	43000
Chloride	µg/l	150	-	-																			20
Chlorine	µg/l		-	10	1	20	20	1	1														
Cyanide	µg/l		-	1	13	370	24800				1190	370	730	780	2900	1820	1920	1840	730	1300	990	1210	24800
Nitrate as NO ₃	µg/l	50	-	-	13	5	66				5	5	43	5	5	66	5	50	5	5	5	5	40
Nitrite as NO ₂	µg/l	5	-	-	2	0.05	0.05				0.05						0.05						
Phenol	µg/l	0.05	-	7.7																			
Pentachlorophenol	µg/l		0.1	0.4																			
PCBs	µg/l		0.001	-																			
Sodium	µg/l		-	-																			
Sulphate	µg/l	45	-	-	13	4900	23800				9950	4900	17600	6310	12800	10800	23800	5980	12200	16400	15700	10100	10000
pH	pH Units		-	-	13	6.8	7.5				6.9	6.9	7	6.9	6.8	6.8	7.1	6.8	7.1	6.9	6.9	6.8	7.5
Dichloromethane	µg/l		-	20																			
1,2 Dichloroethane	µg/l	1	1	10	3	1	1				1						1						1
Trichloroethene (PCE)	µg/l	1	0.1	10	3	1	5	3			1						1						5
1,1,1 Trichloroethane	µg/l	1	0.1	-	3	1	1	3			1						1						1
1,1,2 Trichloroethane	µg/l	1	0.1	-	3	1	1	3			1						1						1
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5	3	1	5	3	1	1	1						1						5
1,2,3 Trichlorobenzene	µg/l	1	-	-	3	1	5				1						1						5
1,2,4 Trichlorobenzene	µg/l	1	0.01	-	3	1	5	3			1						1						5
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4	3	2	10		3	3	2						2						10
Tetrachloroethene	µg/l	1	0.1	10	3	1	5	3			1						1						5
Tetrachloromethane	µg/l	1	0.1	12	3	1	1	3			1						1						1
1,1,1,2 Tetrachloroethane	µg/l	1	-	-	3	1	1				1						1						1
2-chlorophenol	µg/l	0.05	0.1	-							0.05						0.05						
4-chloro-3-methylphenol	µg/l		0.1	-																			
Hexachlorobutadiene	µg/l	1	0.005	0.6				2	2	2	1						1						
Vinyl Chloride (Chloroethene)	µg/l	1	-	-	3	1	1				1						1						1
>C5 to C6 Aliphatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C6 to C8 Aliphatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aliphatic	µg/l	1	-	-	13	1	10				1	1	1	1	1	1	1	1	1	1	1	1	10
>C10 to C12 Aliphatic	µg/l	10	-	-	13	10	42				13	10	10	10	12	10	10	10	10	42	10	10	10
>C12 to C16 Aliphatic	µg/l	10	-	-	13	10	20				16	10	11	10	14	10	20	10	10	18	10	10	10
>C16 to C21 Aliphatic	µg/l	10	-	-	13	10	32				10	10	10	10	10	10	32	10	12	10	10	10	10
>C21 to C35 Aliphatic	µg/l	10	-	-	13	10	190				170	10	100	10	130	10	150	10	95	190	10	10	10
>C35 to C44 Aliphatic	µg/l		-	-																			
Total Aliphatic C5-35	µg/l	43	-	-	12	43	263				212	43	134	43	169	43	215	43	130	263	43	43	
>C5 to C7 Aromatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C7 to C8 Aromatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aromatic	µg/l	1	-	-	13	1	10				1	1	1	1	1	1	1	1	1	1	1	1	10
>C10 to C12 Aromatic	µg/l	10	-	-	13	10	350				140	18	130	10	350	10	230	91	65	160	10	78	10
>C12 to C16 Aromatic	µg/l	10	-	-	13	10	400				230	64	190	10	400	10	270	220	88	150	10	200	10
>C16 to C21 Aromatic	µg/l	10	-	-	13	10	200				130	55	120	10	200	10	130	150	51	67	10	170	10
>C21 to C35 Aromatic	µg/l	10	-	-	13	10	530				480	10	250	10	530	10	280	10	200	320	10	10	10
>C35 to C44 Aromatic	µg/l		-	-																			
Total Aromatic C5-C35	µg/l	43	-	-	12	43	1483				983	150	693	43	1483	43	913	474	407	700	43	461	
TPH Ali/Aro	µg/l	86	-	-	12	86	1652				1195	193	827	86	1652	86	1128	517	537	963	86	504	
Benzene	µg/l	1	1	8	13	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1
Ethylbenzene	µg/l	1	-	-	13	0.5	1				1	1	1	1	1	1	1	1	1	1	1	1	0.5
Toluene	µg/l	1	4	74	13	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1
Xylene	µg/l		3	30																			
M- & P-Xylene	µg/l	1	-	-	13	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1
O-Xylene	µg/l	1	-	-	13	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1
Total Xylene (M, P & O)	µg/l	2	-	30	13	2	2				2	2	2	2	2	2	2	2	2	2	2	2	2
MTBE	µg/l	1	-	-	13	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1
naphthalene	µg/l	0.01	-	2	13	0.01	14.8	2	2		1	0.01	14.8	0.01	0.01	0.01	0.93	0.01	0.65	2.22	0.01	0.01	0.01
acenaphthylene	µg/l	0.01	-	-	13	0.01	0.01				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
acenaphthene	µg/l	0.01	-	-	13	0.01	6.81				0.01	0.01	3.82	0.01	0.01	0.01	0.72	2.22	0.85	5.08	0.01	6.81	0.01
fluorene	µg/l	0.01	-	-	13	0.01	2.24				0.01	0.01	2.24	0.01	0.01	0.01	0.44	1.1	0.56	2.15	0.01	1.74	0.01
phenanthrene	µg/l	0.01	-	-	13	0.01	3.15				0.01	0.01	3.15	0.01	0.01	0.01	0.53	1	0.77	2.28			

TABLE SUMMARISING WATER RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE WATER ASSESSMENT CRITERIA
HAVANT WRP - LP72 (I.3 - CHALK ONLY)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			CP02A @ 17.0	CP02A @ 18.0	RO101 @ 14.30	RO101 @ 15.50	RO101 @ 15.00	RO101 @ 16.00	RO102 @ 15.00	RO102 @ 15.00	RO102 @ 15.50	RO103 @ 15.90	RO103 @ 16.00	RO103 @ 15.00	RO103 @ 16.00	RO104 @ 15.20	RO104 @ 16.50	RO104 @ 16.00	RO104 @ 16.00	RO105 @ 14.90		
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	04/05/2021	19/05/2021	22/03/2021	20/04/2021	04/05/2021	18/05/2021	22/03/2021	20/04/2021	04/05/2021	18/05/2021	22/03/2021	20/04/2021	04/05/2021	19/05/2021	23/03/2021	20/04/2021	04/05/2021	19/05/2021	23/03/2021	
Alkalinity as CaCO ₃	µg/l		-	-	42	0.28	15.1				7.39	5.54	10.5	2.8	15.1	5.75	1.09	2.32	1.84	1.35	2.7	5.52	2.6	1.29	1.52	1.71	0.66	0.28	0.65	
Arsenic	µg/l	0.15	-	25	4	10	520																							
Boron	µg/l		-	-	42	0.02	0.06				0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.03	0.02	0.02	0.02	0.06	0.02	0.02	0.02	0.04		
Chromium (Total)	µg/l	0.2	-	-	42	1	16				6.4	9.9	16	4.6	5.9	6.6	4.6	7.6	5.2	7.2	2.7	2.4	2.1	2.9	3.1	10	1.9	2.4	6.6	
Chromium Trivalent	µg/l		-	-	4	3	3																							
Chromium Hexavalant	µg/l	5	-	0.6	42	3	5		42	42	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
Copper	µg/l	0.5	-	3.76	42	0.6	17		28	28	11	16	9.1	14	9.8	17	5.8	7.9	4.4	8.4	1.6	12	1.1	5.7	2.3	11	0.6	2.7	3.4	
Iron	µg/l		-	1000	3	10	3450		1	1																				
Lead	µg/l	0.2	-	1.3	42	0.2	19		3	3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.2	2.2	0.2	0.2	0.2	19	0.2	0.4	0.2	0.2	
Mercury	µg/l	0.05	0.01	0.07	42	0.03	0.87	42	5	5	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.05	
Manganese	µg/l		-	-	4	2	2020																							
Nickel	µg/l	0.5	-	8.6	42	1	60		30	30	8.4	17	60	6.9	9.8	27	9.2	23	19	20	5.9	5.1	5.3	5.1	5	8.7	3.9	3.8	34	
Selenium	µg/l		-	-	4	1	1																							
Zinc	µg/l	0.5	-	6.8	42	0.5	540		18	18	4.8	8.7	18	2.5	0.5	19	19	190	230	43	23	3.1	4.7	8.6	34	4.4	5.5	7.5	41	
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-	6	27	93000																							
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	38	15	140000		37	37	66000	95000	140000	73000	93000	81000	88000	33000	14000	41000	15	120	26	100	140	44	120	85	28000	
Chloride	µg/l	150	-	-	42	19000	2300000				650000	810000	450000	630000	770000	1000000	280000	310000	120000	200000	170000	140000	71000	63000	110000	32000	28000	28000	91000	
Chlorine	µg/l		-	10																										
Cyanide	µg/l		-	1	4	20	20		4	4																				
Nitrate as NO ₃	µg/l	50	-	-	40	310	77800				1450	1100	1040	1760	2540	1310	10500	3320	8710	10800	620	310	2390	77800	8400	3010	21300	23200	10700	
Nitrite as NO ₂	µg/l	5	-	-	40	5	5300				100	9.2	5	5	5	5	70	1800	410	5300	5	5	290	400	110	3010	21300	23200	10700	
Phenol	µg/l	0.05	-	7.7	5	0.05	0.05						0.05					0.05			0.05									
Pentachlorophenol	µg/l		0.1	0.4																										
PCBs	µg/l		0.001	-																										
Sodium	µg/l		-	-																										
Sulphate	µg/l	45	-	-	42	4000	217000				44900	39600	23200	49700	58700	110000	67500	48100	38000	30200	42200	27800	13000	9130	73900	27200	25500	22200	39300	
pH	pH Units		-	-	42	6.8	7.5				6.9	6.8	6.9	6.9	6.8	6.8	7	6.8	6.9	7	7.2	7.3	7.3	7.4	7.4	7.3	7.2	7.4	7	
Dichloromethane	µg/l		-	20																										
1,2 Dichloroethane	µg/l	1	1	10	9	1	1						1				1				1									
Trichloroethene (PCE)	µg/l	1	0.1	10	9	1	5	9					1				1				1									
1,1,1 Trichloroethane	µg/l	1	0.1	-	9	1	1	9					1				1				1									
1,1,2 Trichloroethane	µg/l	1	0.1	-	9	1	1	9					1				1				1									
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5	9	1	5	9	4	4			1				1				1									
1,2,3 Trichlorobenzene	µg/l	1	-	-	9	1	5						1				1				1									
1,2,4 Trichlorobenzene	µg/l	1	0.01	-	9	1	5	9					1				1				1									
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4	9	2	10	9	9				2				2				2									
Tetrachloroethene	µg/l	1	0.1	10	9	1	5	9					1				1				1									
Tetrachloromethane	µg/l	1	0.1	12	9	1	1	9					1				1				1									
1,1,1,2 Tetrachloroethane	µg/l	1	-	-	9	1	1						1				1				1									
2-chlorophenol	µg/l	0.05	0.1	-									0.05				0.05				0.05									
4-chloro-3-methylphenol	µg/l		0.1	-																										
Hexachlorobutadiene	µg/l	1	0.005	0.6				5	5	5			1				1				1									
Vinyl Chloride (Chloroethene)	µg/l	1	-	-	9	1	1						1				1				1									
>C5 to C6 Aliphatic	µg/l	1	-	-	38	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C8 Aliphatic	µg/l	1	-	-	38	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aliphatic	µg/l	1	-	-	41	1	10				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C10 to C12 Aliphatic	µg/l	10	-	-	41	10	63				10	10	10	63	10	10	10	10	10	10	10	10	10	10	13	10	10	10	10	
>C12 to C16 Aliphatic	µg/l	10	-	-	41	10	21				10	10	17	21	10	10	10	10	10	10	10	10	10	10	21	10	10	10	10	
>C16 to C21 Aliphatic	µg/l	10	-	-	41	10	26				10	10	13	12	10	10	10	10	10	10	10	10	10	10	26	10	10	10	10	
>C21 to C35 Aliphatic	µg/l	10	-	-	41	10	160				10	10	130	160	10	10	10	92	10	10	10	10	10	10	160	10	10	10	10	
>C35 to C44 Aliphatic	µg/l		-	-																										
Total Aliphatic C5-35	µg/l	43	-	-	38	43	259				43	43	173	259	43	43	43	125	43	43	43	43	43	43	223	43	43	43	43	
>C5 to C7 Aromatic	µg/l	1	-	-	38	1	5.9				1	1	5.9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C7 to C8 Aromatic	µg/l	1	-	-	38	1	6.4				1	1	6.4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aromatic	µg/l	1	-	-	41	1	10				1	1	5.8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C10 to C12 Aromatic	µg/l	10	-	-	41	10	1700				10	120	250	1700	10	64	10	80	10	10	10	10	10	10	55	10	10	10	10	
>C12 to C16 Aromatic	µg/l	10	-	-	41	10	530				10	290	380	530	10	180	10	140	10	10	10	10	10	10	110	10	10	10	10	
>C16 to C21 Aromatic	µg/l	10	-	-	41	10	250				10	250	150	220	10	120	10	78	10	10	10	10	10	10	99	10	10	10	10	
>C21 to C35 Aromatic	µg/l	10	-	-	41	10	600				10	10	300	600	10	10	10	10	10	10	10	10	10	10	480	10	10	10	10	
>C35 to C44 Aromatic	µg/l		-	-																										
Total Aromatic C5-C35	µg/l	43	-	-	38	43	3053				43	673	1098.1	3053	43	377	43	311	43	43	43	43	43	43	747	43	43	43	43	
TPH Ali/Aro	µg/l	86	-	-	38	86	3312																							

HAVANT WRP - LP72 (I.3 - CHALK ONLY)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			RO105 @ 14.50	RO105 @ 15.00	RO105 @ 15.50	RO106 @ 16.60	RO106 @ 16.00	RO106 @ 17.00	RO106 @ 17.00	RO107 @ 14.80	RO107 @ 15.00	RO107 @ 15.00	RO107 @ 15.00	RO108 @13.10	RO108 @ 13.00	RO108 @ 14.00	RO108 @13.25	RO109 @ 14.00	RO109 @ 14.50	RO109 @ 14.50	RO109 @ 14.50	BHRP01
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	20/04/2021	04/05/2021	19/05/2021	23/03/2021	20/04/2021	04/05/2021	19/05/2021	23/03/2021	20/04/2021	05/05/2021	18/05/2021	23/03/2021	20/04/2021	04/05/2021	18/05/2021	04/05/2021	23/03/2021	20/04/2021	19/05/2021	23/03/2021
Alkalinity as CaCO ₃	µg/l		-	-	42	0.28	15.1				5.13	7.74	6.05	4.41	5.53	13.3	10.8	9.24	8.71	8.73	4.45	2.69	4.03	2.48	1.32	0.73	2.83	1.17	0.55	1
Arsenic	µg/l	0.15	-	25	4	10	520																							20
Boron	µg/l		-	-	4	3	3				0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Cadmium	µg/l	0.02	0.1	0.2	42	0.02	0.06				9.6	5.8	6.5	5.5	5	4.3	5.8	3.5	4.1	3.3	4.1	6.9	6.9	4	3.6	3.1	5.6	4.2	3.5	1
Chromium (Total)	µg/l	0.2	-	-	4	1	16																							3
Chromium Trivalent	µg/l		-	-	4	3	3																							3
Chromium Hexavalant	µg/l	5	-	0.6	42	3	5				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3
Copper	µg/l	0.5	-	3.76	42	0.6	17				9.4	1.7	2.8	3.2	4.3	2.7	5.4	9.7	16	15	15	7	6.1	6.4	4.4	5.4	4.4	5.1	4.3	1
Iron	µg/l		-	1000	3	10	3450																							920
Lead	µg/l	0.2	-	1.3	42	0.2	19				0.2	0.2	0.2	2.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1
Mercury	µg/l	0.05	0.01	0.07	42	0.03	0.87	42			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.56	0.83	0.87	0.58	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.03
Manganese	µg/l		-	-	4	2	2020																							2
Nickel	µg/l	0.5	-	8.6	42	1	60				19	10	14	20	40	35	28	20	24	19	15	20	24	13	8.3	12	29	14	10	1
Selenium	µg/l		-	-	4	1	1																							1
Zinc	µg/l	0.5	-	6.8	42	0.5	540				18	18																		1
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-	6	27	93000				3.4	1.7	5.5	540	6.1	0.5	5.4	4.4	8.8	5	5.5	9.2	6.1	3.4	2.5	7	9.1	4.9	5	4
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	38	15	140000				44000	26000	25000	17000	23000	13000	12000	230	120	40	110	47000	43000	17000	3500	14000	25000	19000	10000	
Chloride	µg/l	150	-	-	42	19000	2300000				160000	100000	86000	420000	540000	480000	490000	1300000	2300000	1200000	930000	410000	370000	330000	270000	87000	150000	120000	83000	20000
Chlorine	µg/l		-	10																										20
Cyanide	µg/l		-	1	4	20	20																							
Nitrate as NO ₃	µg/l	50	-	-	40	310	77800				1400	360	680	930	880	420	790	7730	10600	11000	8510	1820	1040	13600	22900	31000	11700	25700	32400	
Nitrite as NO ₂	µg/l	5	-	-	40	5	5300				5	5	5	28	5	5	5	190	5	8	25	330	44	330	770	630	510	380	1100	
Phenol	µg/l	0.05	-	7.7	5	0.05	0.05											0.05									0.05			
Pentachlorophenol	µg/l		0.1	0.4																										
PCBs	µg/l		0.001	-																										
Sodium	µg/l		-	-																										
Sulphate	µg/l	45	-	-	42	4000	217000				4760	15200	13600	97500	48500	37900	22800	208000	217000	165000	184000	63100	51400	54100	50300	19900	20500	20600	18000	13000
pH	pH Units		-	-	42	6.8	7.5				6.9	7	7	7.2	7.1	7	7	7.2	7.3	7.2	7.3	7	7	7.1	7.2	7.1	7	7	7.1	7.5
Dichloromethane	µg/l		-	20																										
1,2 Dichloroethane	µg/l	1	1	10	9	1	1												1									1		1
Trichloroethene (PCE)	µg/l	1	0.1	10	9	1	5	9											1								1		5	
1,1,1 Trichloroethane	µg/l	1	0.1	-	9	1	1	9											1								1		1	
1,1,2 Trichloroethane	µg/l	1	0.1	-	9	1	1	9											1								1		1	
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5	9	1	5	9	4	4									1								1		5	
1,2,3 Trichlorobenzene	µg/l	1	-	-	9	1	5												1								1		5	
1,2,4 Trichlorobenzene	µg/l	1	0.01	-	9	1	5	9											1								1		5	
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4	9	2	10		9	9									2								2		10	
Tetrachloroethene	µg/l	1	0.1	10	9	1	5	9											1								1		5	
Tetrachloromethane	µg/l	1	0.1	12	9	1	1	9											1								1		1	
1,1,1,2 Tetrachloroethane	µg/l	1	-	-	9	1	1												1								1		1	
2-chlorophenol	µg/l	0.05	0.1	-															0.05								0.05			
4-chloro-3-methylphenol	µg/l		0.1	-																										
Hexachlorobutadiene	µg/l	1	0.005	0.6				5	5	5									1								1			
Vinyl Chloride (Chloroethene)	µg/l	1	-	-	9	1	1												1											1
>C5 to C6 Aliphatic	µg/l	1	-	-	38	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C6 to C8 Aliphatic	µg/l	1	-	-	38	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aliphatic	µg/l	1	-	-	41	1	10				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10
>C10 to C12 Aliphatic	µg/l	10	-	-	41	10	63				10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
>C12 to C16 Aliphatic	µg/l	10	-	-	41	10	21				10	10	10	10	13	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
>C16 to C21 Aliphatic	µg/l	10	-	-	41	10	26				10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
>C21 to C35 Aliphatic	µg/l	10	-	-	41	10	160				10	10	10	10	110	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
>C35 to C44 Aliphatic	µg/l		-	-																										
Total Aliphatic C5-35	µg/l	43	-	-	38	43	259				43	43	43	43	146	43	43	43	43	43	43	43	43	43	43	43	43	43	43	
>C5 to C7 Aromatic	µg/l	1	-	-	38	1	5.9				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C7 to C8 Aromatic	µg/l	1	-	-	38	1	6.4				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aromatic	µg/l	1	-	-	41	1	10				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10
>C10 to C12 Aromatic	µg/l	10	-	-	41	10	1700				10	10	10	10	160	10	14	10	10	10	10	10	10	10	10	10	10	10	10	10
>C12 to C16 Aromatic	µg/l	10	-	-	41	10	530				10	10	10	10	250	10	130	10	10	10	10	10	10	10	10	10	10	10	10	10
>C16 to C21 Aromatic	µg/l	10	-	-	41	10	250				10	10	10	10	150	10	44	10	10	10	10	10	10	10	10	10	10	10	10	10
>C21 to C35 Aromatic	µg/l	10	-	-	41	10	600				10	10	10	10	450	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
>C35 to C44 Aromatic	µg/l		-	-																										
Total Aromatic C5-C35	µg/l	43	-	-	38	43	3053																							

TABLE SUMMARISING WATER RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE WATER ASSESSMENT CRITERIA
HAVANT WRP - LP72 (I.3 - CHALK ONLY)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			BHRP02	BHW001	BHW002
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	16/02/2023	16/02/2023	16/02/2023
Alkalinity as CaCO ₃	µg/l		-	-	42	0.28	15.1				1	1	1
Arsenic	µg/l	0.15	-	25	4	10	520				10	160	520
Boron	µg/l		-	-	42	0.02	0.06				0.02	0.02	0.02
Cadmium	µg/l	0.02	0.1	0.2	42	1	16				1	1	1
Chromium (Total)	µg/l	0.2	-	-	4	3	3				3	3	3
Chromium Trivalent	µg/l		-	-	42	3	5	42	42	3	3	3	3
Chromium Hexavalant	µg/l	5	-	0.6	42	0.6	17	28	28	1	1	1	1
Copper	µg/l	0.5	-	3.76	3	10	3450	1	1	3450	10		
Iron	µg/l		-	1000	42	0.2	19	3	3	1	1	1	1
Lead	µg/l	0.2	-	1.3	42	0.03	0.87	42	5	5	0.03	0.03	0.03
Mercury	µg/l	0.05	0.01	0.07	4	2	2020				2	18	2020
Manganese	µg/l		-	-	42	1	60	30	30	1	10	25	
Nickel	µg/l	0.5	-	8.6	4	1	1				1	1	1
Selenium	µg/l		-	-	42	0.5	540	18	18	2	10	3	
Zinc	µg/l	0.5	-	6.8	6	27	93000						
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-	38	15	140000	37	37				
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	42	19000	2300000				19000	124000	244000
Chloride	µg/l	150	-	-									
Chlorine	µg/l		-	10	4	20	20	4	4	20	20	20	
Cyanide	µg/l		-	1	40	310	77800				28900	16700	
Nitrate as NO ₃	µg/l	50	-	-	40	5	5300				40	1110	
Nitrite as NO ₂	µg/l	5	-	-	5	0.05	0.05						
Phenol	µg/l	0.05	-	7.7									
Pentachlorophenol	µg/l		0.1	0.4									
PCBs	µg/l		0.001	-									
Sodium	µg/l		-	-									
Sulphate	µg/l	45	-	-	42	4000	217000				13000	21000	4000
pH	pH Units		-	-	42	6.8	7.5				7.5	7.2	7.1
Dichloromethane	µg/l		-	20	9	1	1				1	1	1
1,2 Dichloroethane	µg/l	1	1	10	9	1	5	9			5	5	5
Trichloroethene (PCE)	µg/l	1	0.1	10	9	1	1	9			1	1	1
1,1,1 Trichloroethane	µg/l	1	0.1	-	9	1	1	9			1	1	1
1,1,2 Trichloroethane	µg/l	1	0.1	-	9	1	5	9	4	4	5	5	5
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5	9	1	5	9			5	5	5
1,2,3 Trichlorobenzene	µg/l	1	-	-	9	1	5	9			5	5	5
1,2,4 Trichlorobenzene	µg/l	1	0.01	-	9	1	5	9			5	5	5
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4	9	2	10	9	9	10	10	10	
Tetrachloroethene	µg/l	1	0.1	10	9	1	5	9			5	5	5
Tetrachloromethane	µg/l	1	0.1	12	9	1	1	9			1	1	1
1,1,1,2 Tetrachloroethane	µg/l	1	-	-	9	1	1				1	1	1
2-chlorophenol	µg/l	0.05	0.1	-									
4-chloro-3-methylphenol	µg/l		0.1	-									
Hexachlorobutadiene	µg/l	1	0.005	0.6				5	5	5			
Vinyl Chloride (Chloroethene)	µg/l	1	-	-	9	1	1				1	1	1
>C5 to C6 Aliphatic	µg/l	1	-	-	38	1	1						
>C6 to C8 Aliphatic	µg/l	1	-	-	38	1	1						
>C8 to C10 Aliphatic	µg/l	1	-	-	41	1	10				10	10	
>C10 to C12 Aliphatic	µg/l	10	-	-	41	10	63				10	10	
>C12 to C16 Aliphatic	µg/l	10	-	-	41	10	21				10	10	
>C16 to C21 Aliphatic	µg/l	10	-	-	41	10	26				10	10	
>C21 to C35 Aliphatic	µg/l	10	-	-	41	10	160				10	10	
>C35 to C44 Aliphatic	µg/l		-	-									
Total Aliphatic C5-35	µg/l	43	-	-	38	43	259						
>C5 to C7 Aromatic	µg/l	1	-	-	38	1	5.9						
>C7 to C8 Aromatic	µg/l	1	-	-	38	1	6.4						
>C8 to C10 Aromatic	µg/l	1	-	-	41	1	10				10	10	
>C10 to C12 Aromatic	µg/l	10	-	-	41	10	1700				10	10	
>C12 to C16 Aromatic	µg/l	10	-	-	41	10	530				10	10	
>C16 to C21 Aromatic	µg/l	10	-	-	41	10	250				10	10	
>C21 to C35 Aromatic	µg/l	10	-	-	41	10	600				10	10	
>C35 to C44 Aromatic	µg/l		-	-									
Total Aromatic C5-C35	µg/l	43	-	-	38	43	3053						
TPH Ali/Aro	µg/l	86	-	-	38	86	3312						
Benzene	µg/l	1	1	8	42	1	5.9	1			1	1	1
Ethylbenzene	µg/l	1	-	-	42	0.5	1				0.5	0.5	0.5
Toluene	µg/l	1	4	74	42	1	6.4	1			1	1	1
Xylene	µg/l		3	30									
M- & P-Xylene	µg/l	1	-	-	42	1	1.9				1	1	1
O-Xylene	µg/l	1	-	-	42	1	1				1	1	1
Total Xylene (M, P & O)	µg/l	2	-	30	42	1	2				2	2	2
MTBE	µg/l	1	-	-	42	1	1				1	1	1
naphthalene	µg/l	0.01	-	2	42	0.01	2.02	1	1	0.01	0.01	0.01	0.02
acenaphthylene	µg/l	0.01	-	-	42	0.01	0.01				0.01	0.01	0.01
acenaphthene	µg/l	0.01	-	-	42	0.01	6.45				0.01	0.01	0.04
fluorene	µg/l	0.01	-	-	42	0.01	2.88				0.01	0.01	0.02
phenanthrene	µg/l	0.01	-	-	42	0.01	0.66				0.01	0.01	0.03
anthracene	µg/l	0.01	-	0.1	42	0.01	0.01				0.01	0.01	0.01
fluoranthene	µg/l	0.01	-	0.0063	42	0.01	0.29	42	42	0.01	0.01	0.01	0.02
pyrene	µg/l	0.01	-	-	42	0.01	0.24				0.01	0.01	0.03
benzo(a)anthracene	µg/l	0.01	-	-	42	0.01	0.01				0.01	0.01	0.01
chrysene	µg/l	0.01	-	-	42	0.01	0.01				0.01	0.01	0.01
benzo(b)fluoranthene	µg/l	0.01	-	0.017	42	0.01	0.01				0.01	0.01	0.01
benzo(k)fluoranthene	µg/l	0.01	-	0.017	42	0.01	0.01				0.01	0.01	0.01
benzo(a)pyrene	µg/l	0.01	-	0.00017	42	0.01	0.01	42	42	0.01	0.01	0.01	0.01
benzo(g,h,i)perylene	µg/l	0.01	-	0.00082	42	0.01	0.01	42	42	0.01	0.01	0.01	0.01
dibenzo(ah)anthracene	µg/l	0.01	-	-	42	0.01	0.01				0.01	0.01	0.01
indeno(1,2,3-c,d)pyrene	µg/l	0.01	-	-	42	0.01	0.01				0.01	0.01	0.01
Sum (benzo b, k, ghi & indeno123cd)	µg/l	0.04	-	-	42	0.04	0.04				0.04	0.04	0.04
Total PAH	µg/l	0.16	-	-	42	0.16	9.88				0.16	0.16	0.26

TABLE SUMMARISING WATER RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE WATER ASSESSMENT CRITERIA
HAVANT WRP - LP72 (I.4 - SURFACE WATER ONLY)

England & Wales			Assessment Criteria		No. of Tests	Min	Max	No. of Exceedences			DOWNSTREAM HIGH TIDE	DOWNSTREAM HIGH TIDE	DOWNSTREAM LOW TIDE	DOWNSTREAM LOW TIDE	MIDSTREAM HIGH TIDE	MIDSTREAM HIGH TIDE	MIDSTREAM LOW TIDE	MIDSTREAM LOW TIDE	UPSTREAM HIGH TIDE	UPSTREAM HIGH TIDE	UPSTREAM LOW TIDE	UPSTREAM LOW TIDE	
Analyte	Units	LOD	MRV	Salt Water				MRV	Salt Water	Salt Water	20/04/2021	04/05/2021	20/04/2021	04/05/2021	20/04/2021	04/05/2021	20/04/2021	04/05/2021	20/04/2021	04/05/2021	20/04/2021	04/05/2021	
Alkalinity as CaCO ₃	µg/l		-	-	12	0.84	9.69																
Arsenic	µg/l	0.15	-	25	12	0.84	9.69				9.69	2.2	1.54	2.28	7.83	1.04	0.84	1.44	3.87	5.35	0.99	1.49	
Boron	µg/l		-	-																			
Cadmium	µg/l	0.02	0.1	0.2	12	0.02	0.02				0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
Chromium (Total)	µg/l	0.2	-	-	12	1.7	3.4				2.9	2	2.3	1.7	2.4	3.4	2.2	1.8	2.9	2.3	2.3	1.9	
Chromium Trivalent	µg/l		-	-																			
Chromium Hexavalant	µg/l	5	-	0.6	12	5	5	12	12		5	5	5	5	5	5	5	5	5	5	5	5	
Copper	µg/l	0.5	-	3.76	12	2.5	11	10	10		8.3	9.4	9.3	5	11	2.5	2.5	5.1	5.8	6.8	5	6.4	
Iron	µg/l		-	1000																			
Lead	µg/l	0.2	-	1.3	12	0.2	0.2				0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Mercury	µg/l	0.05	0.01	0.07	12	0.05	0.05	12			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
Manganese	µg/l		-	-																			
Nickel	µg/l	0.5	-	8.6	12	2.1	6.7				2.5	2.3	2.1	2.4	2.6	6.7	2.5	2.3	2.4	2.9	2.2	2.3	
Selenium	µg/l		-	-																			
Zinc	µg/l	0.5	-	6.8	12	0.9	31	1	1		1.5	2	1.5	3.3	1.7	1.2	31	4.8	2.7	2.9	0.9	1.8	
Ammoniacal Nitrogen as NH ₄	µg/l	15	-	-																			
Ammoniacal Nitrogen as NH ₃	µg/l	15	-	21	12	15	130	7	7		17	18	92	87	15	31	130	100	24	48	15	15	
Chloride	µg/l	150	-	-	12	68000	11000000				970000	120000	170000	290000	1000000	11000000	78000	130000	680000	740000	68000	120000	
Chlorine	µg/l		-	10																			
Cyanide	µg/l		-	1																			
Nitrate as NO ₃	µg/l	50	-	-	12	27300	36200				31800	33700	35900	31000	34500	27300	35500	32100	34400	28200	36200	31600	
Nitrite as NO ₂	µg/l	5	-	-	12	5	74				5	19	20	74	5	19	10	50	5	35	6.9	48	
Phenol	µg/l	0.05	-	7.7																			
Pentachlorophenol	µg/l		0.1	0.4																			
PCBs	µg/l		0.001	-																			
Sodium	µg/l		-	-																			
Sulphate	µg/l	45	-	-	12	24800	1830000				164000	31000	38100	47400	157000	1830000	25400	33000	128000	94200	24800	32200	
pH	pH Units		-	-	12	7.4	7.9				7.5	7.7	7.8	7.9	7.5	7.7	7.7	7.9	7.4	7.7	7.7	7.8	
Dichloromethane	µg/l		-	20																			
1,2 Dichloroethane	µg/l	1	1	10																			
Trichloroethene (PCE)	µg/l	1	0.1	10																			
1,1,1 Trichloroethane	µg/l	1	0.1	-																			
1,1,2 Trichloroethane	µg/l	1	0.1	-																			
Trichloromethane (Chloroform)	µg/l	1	0.1	2.5																			
1,2,3 Trichlorobenzene	µg/l	1	-	-																			
1,2,4 Trichlorobenzene	µg/l	1	0.01	-																			
Trichlorobenzene (1,2,3 & 1,2,4)	µg/l	2	-	0.4																			
Tetrachloroethene	µg/l	1	0.1	10																			
Tetrachloromethane	µg/l	1	0.1	12																			
1,1,1,2 Tetrachloroethane	µg/l	1	-	-																			
2-chlorophenol	µg/l	0.05	0.1	-																			
4-chloro-3-methylphenol	µg/l		0.1	-																			
Hexachlorobutadiene	µg/l	1	0.005	0.6																			
Vinyl Chloride (Chloroethene)	µg/l	1	-	-																			
>C5 to C6 Aliphatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C6 to C8 Aliphatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aliphatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C10 to C12 Aliphatic	µg/l	10	-	-	12	10	10				10	10	10	10	10	10	10	10	10	10	10	10	
>C12 to C16 Aliphatic	µg/l	10	-	-	12	10	10				10	10	10	10	10	10	10	10	10	10	10	10	
>C16 to C21 Aliphatic	µg/l	10	-	-	12	10	10				10	10	10	10	10	10	10	10	10	10	10	10	
>C21 to C35 Aliphatic	µg/l	10	-	-	12	10	10				10	10	10	10	10	10	10	10	10	10	10	10	
>C35 to C44 Aliphatic	µg/l		-	-																			
Total Aliphatic C5-35	µg/l		-	-																			
>C5 to C7 Aromatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C7 to C8 Aromatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C8 to C10 Aromatic	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
>C10 to C12 Aromatic	µg/l	10	-	-	12	10	10				10	10	10	10	10	10	10	10	10	10	10	10	
>C12 to C16 Aromatic	µg/l	10	-	-	12	10	10				10	10	10	10	10	10	10	10	10	10	10	10	
>C16 to C21 Aromatic	µg/l	10	-	-	12	10	10				10	10	10	10	10	10	10	10	10	10	10	10	
>C21 to C35 Aromatic	µg/l	10	-	-	12	10	10				10	10	10	10	10	10	10	10	10	10	10	10	
>C35 to C44 Aromatic	µg/l		-	-																			
Total Aromatic C5-C35	µg/l		-	-																			
TPH Ali/Aro	µg/l		-	-																			
Benzene	µg/l	1	1	8	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
Ethylbenzene	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
Toluene	µg/l	1	4	74	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
Xylene	µg/l		3	30																			
M- & P-Xylene	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
O-Xylene	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
Total Xylene (M, P & O)	µg/l	2	-	30	12	2	2				2	2	2	2	2	2	2	2	2	2	2	2	
MTBE	µg/l	1	-	-	12	1	1				1	1	1	1	1	1	1	1	1	1	1	1	
naphthalene	µg/l	0.01	-	2	12	0.01	0.01				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
acenaphthylene	µg/l	0.01	-	-	12	0.01	0.01				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
acenaphthene	µg/l	0.01	-	-	12	0.01	0.01				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
fluorene	µg/l	0.01	-	-	12	0.01	0.01				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
phenanthrene	µg/l	0.01	-	-	12	0.01	0.01				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
anthracene	µg/l	0.01	-	0.1	12	0.01	0.01				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
fluoranthene	µg/l	0.01	-	0.0063	12	0.01	0.01	12	12		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
pyrene	µg/l	0.01	-	-	12	0.01	0.01				0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
benzo(a)anthracene	µg/l	0.01	-	-	12	0.01	0.01				0.01	0.01	0.01										