Green Hill Solar Farm
EN010170

Environmental Statement
Appendix 10.3: Flood Risk Assessment and Drainage Strategy Annex B: Green Hill A

Prepared by: Arthian

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Appendix 10.3: Annex B - Flood Risk Assessment and Drainage Strategy – Green Hill A

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Site: Green Hill A

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Annexes

1. Site Details

The aim of this section of the report is to outline key environmental information associated with the baseline environment.

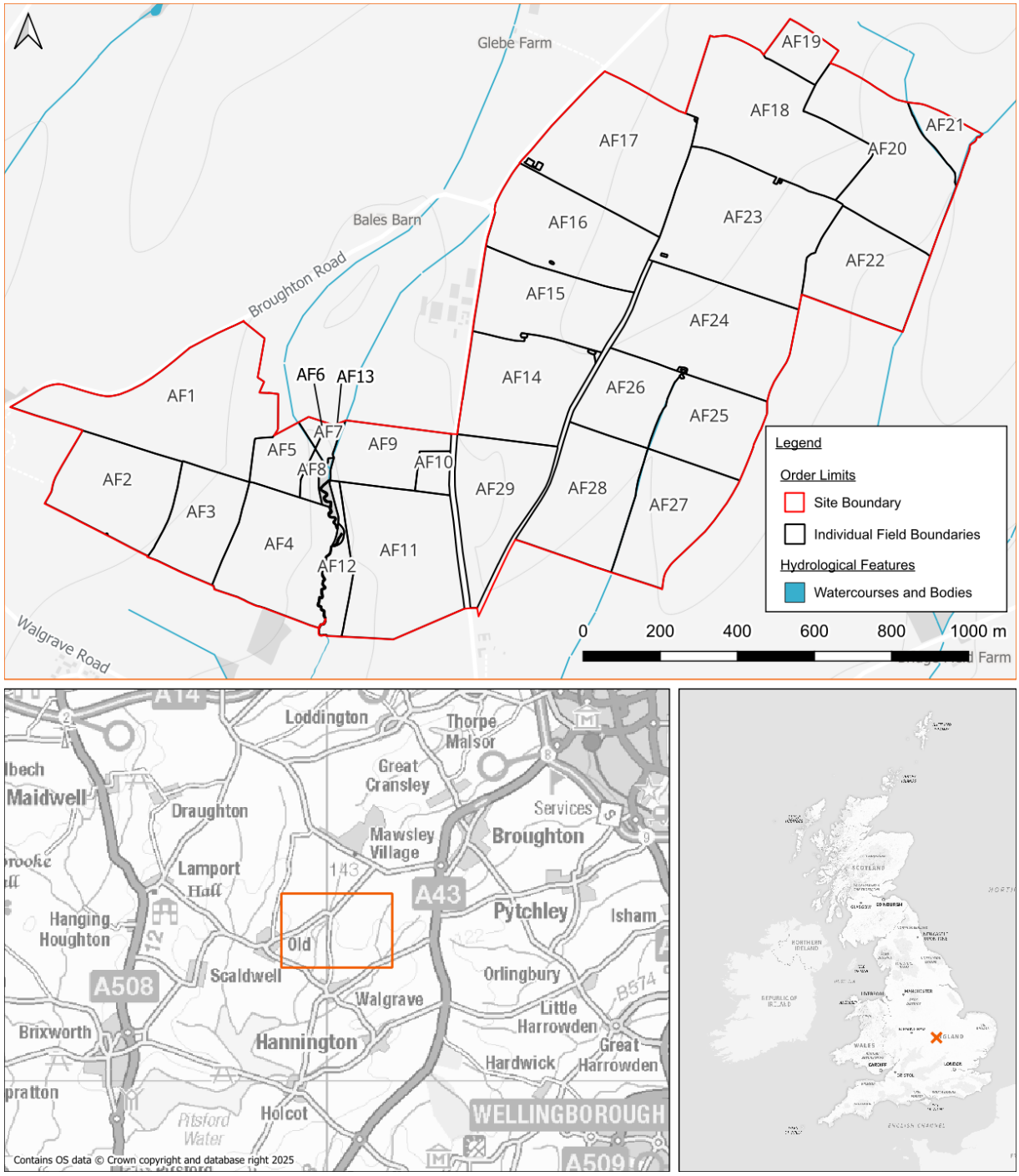

Figure 1: Site Location Plan

1.1 Site Location

1.1.1 Green Hill A is located north of Walgrave, a village in West Northamptonshire, located 6.2km south-west of Kettering Train Station. The National Grid Reference for Green Hill is approximately 479020, 273160 in the southwest (AF2) to 481390, 274220 in the northeast (AF21).

1.2 Existing Site Conditions

1.2.1 Online mapping (including Google Maps / Google Streetview imagery accessed March 2025)[i] shows that Green Hill A is greenfield, comprising agricultural / arable fields.

1.3 Topography

1.3.1 Topographic levels to metres Above Ordnance Datum (m AOD) have been derived from a 1m resolution Environment Agency (EA) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). A review of LiDAR ground elevation data shows that Green Hill A has a topographic highpoint of approximately 135m AOD within the northern Fields AF19 and AF18. The elevation then slopes to the south before dispersing west, south, and east accordingly. The lowest elevation within Green Hill A is in the southern Fields AF12 with an elevation of approximately 106m AOD (Figure 2).

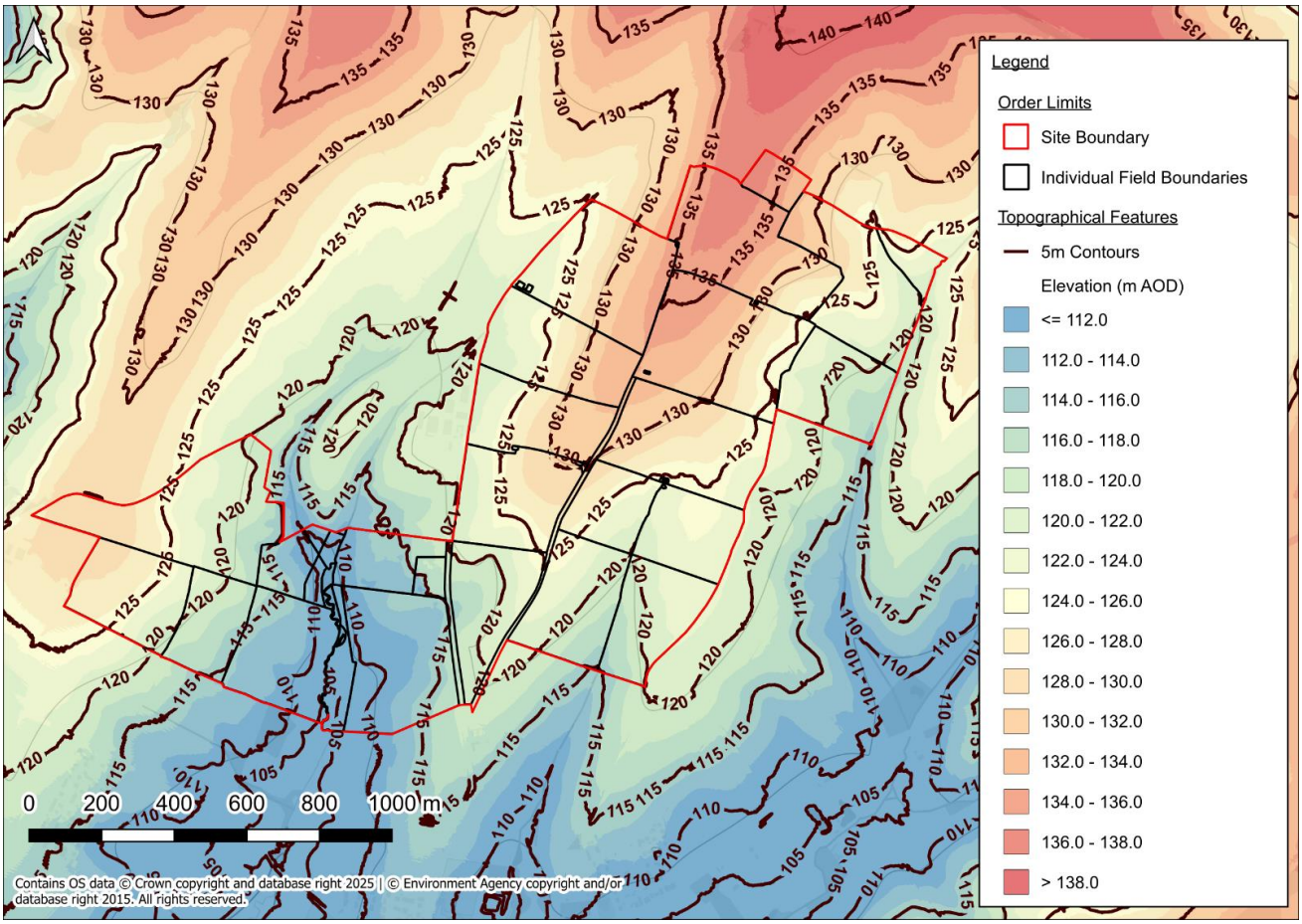

Figure 2: LiDAR Plan

1.4 Hydrology

1.4.1 The nearest EA Main River is located approximately 500m northwest of Green Hill A, with further discussion provided in Section 2.0. A series of land drains are shown to run throughout Green Hill A.

1.4.2 Two land drains enter the Site at Fields AF13 and AF6 and converge at the south of AF7. The combined land drain then flows southwards, between Fields AF8 and AF9 then between AF4 and AF12, before flowing southwards off-Site.

1.4.3 There are also two land drains which enter Green Hill A to the north-west of Field AF21 and north-east of Field AF21 and flow along the western and eastern boundaries of Field AF21 before converging at the south of the Field. The land drain then flows along the eastern boundary of Fields AF20 and AF22.

1.5 Water Framework Directive Status

1.5.1 Green Hill A is located within the Nene Catchment, specifically the Pitsford Arm of the Brampton Branch Water Body[ii]. The Pitsford Arm of the Brampton Branch Water Body catchment has a Cycle 3 Ecological status of Good in 2019 and 2022 and a Failing chemical status in 2019 (no data in 2022).

1.5.2 A summary of the Water Body Classification for the catchment is included as Annex A.

1.6 Geology

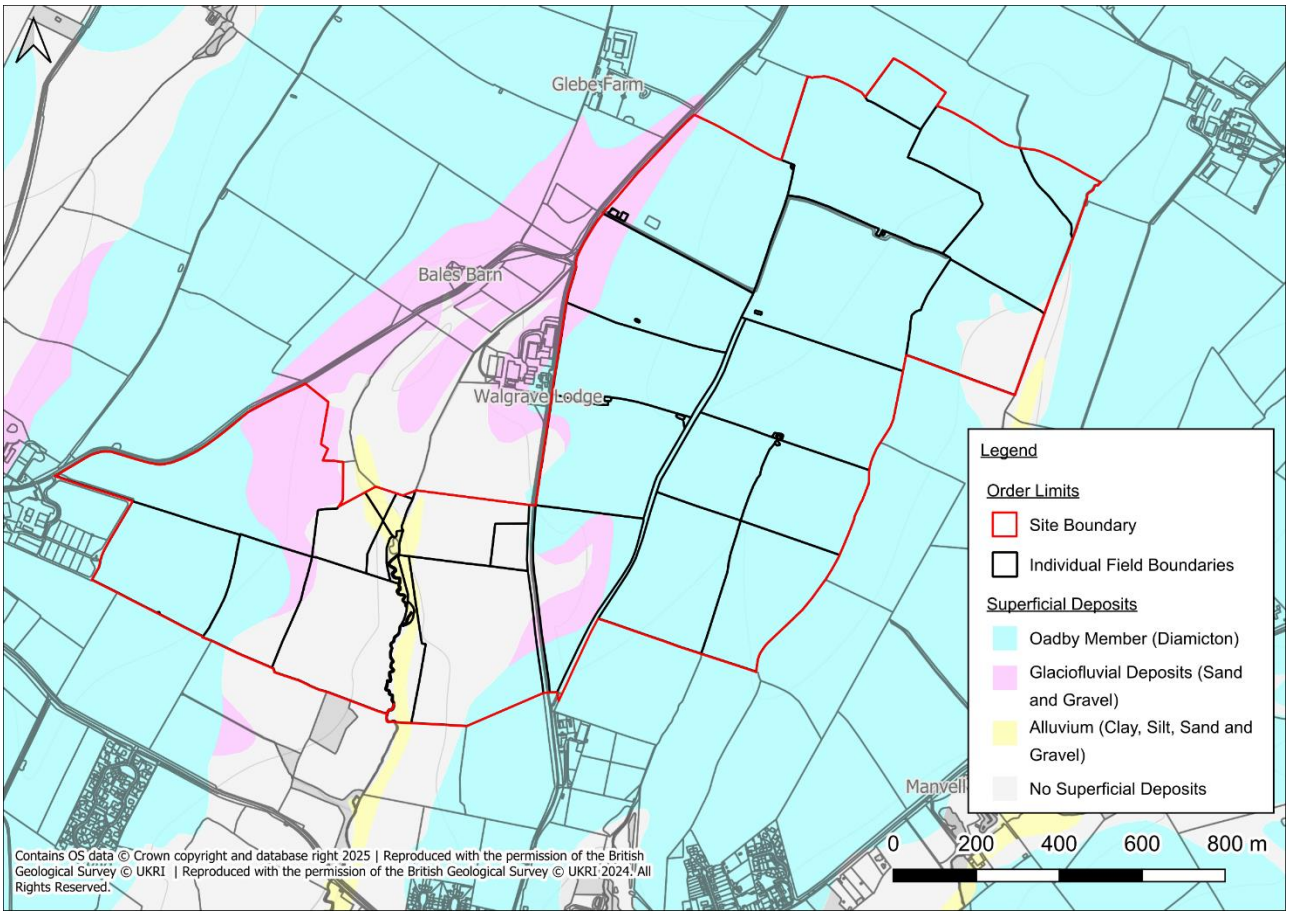

Figure 3: Superficial Deposits

1.6.1 Reference to the British Geological Survey (BGS) online mapping[iii] (1:50,000 scale) indicates that Green Hill A is underlain by the following superficial deposits (see Figure 3 for the locations of the varying deposits):

- Oadby Member generally comprising diamicton;
- Glaciofluvial Deposits (mid Pleistocene) consisting of sand and gravel; and
- Alluvium, consisting of clay, silt, sand, and gravel.

1.6.2 There are also areas on-Site identified as not being underlain by any superficial deposits.

1.6.3 Green Hill A is identified as being underlain by the following bedrock deposits (see Figure 4 for the locations of the varying deposits):

- Northampton Sand Formation, consisting of Ironstone (ooidal);
- Whitby Mudstone Formation, comprising Mudstone;
- Stamford Member, comprising Sandstone and siltstone (interbedded); and
- Rutland Formation, consisting of Mudstone.

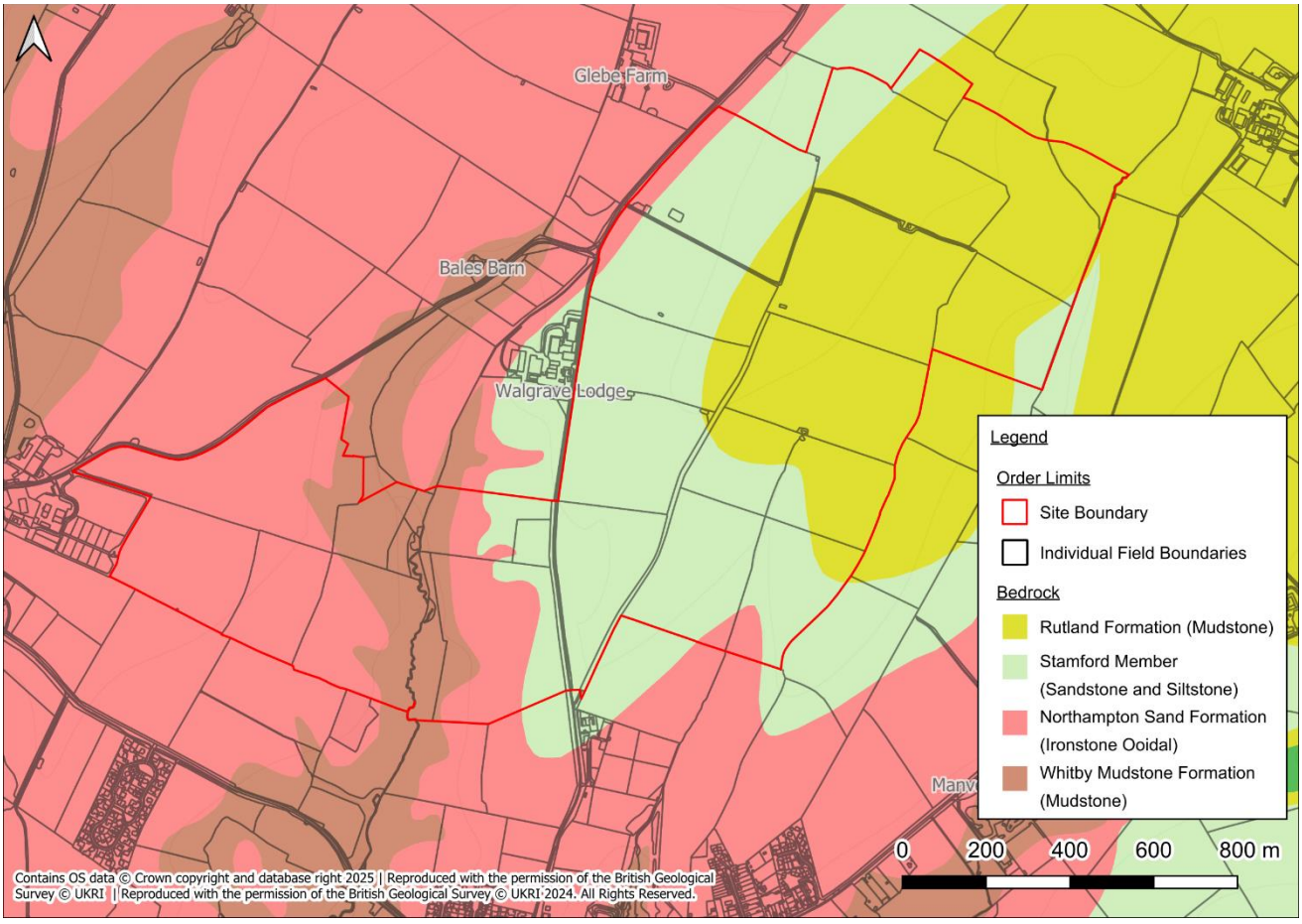

Figure 4: Bedrock Deposits

1.6.4 The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a Site-

specific basis.

1.6.5 There are several BGS borehole records located in the east of Green Hill A. BGS Borehole Ref: SP77SE153 (NGR 479910, 273190), dated 1935, identifies the following geological sequence:

- Soil and subsoil (2m bgl);
- Clay (4m bgl);
- Red sand and stone (6m bgl);
- Workable ironstone (10m bgl); and
- Soft clayey ironstone (16m bgl).

1.7 Hydrogeology

1.7.1 According to the EA's Aquifer Designation data, obtained from MAGIC Map's online mapping[iv] [accessed 24/05/24], the Oadby Member is classified as a Secondary Undifferentiated Aquifer, whereas the Alluvium and Glaciofluvial Deposits are identified as Secondary A Aquifers.

1.7.2 The underlying Northampton Sand Formation and Stamford Member are described as Secondary A Aquifers whereas the Rutland Formation is described as a Secondary B Aquifer. The Whitby Mudstone Formation is described as an Unproductive Aquifer.

1.7.3 The EA's 'Source Protection Zones' data, obtained from MAGIC Map's online mapping [accessed 24/05/24], indicates that Green Hill A is not located within a Groundwater Source Protection Zone.

1.8 Proposed Site Conditions

1.8.1 Green Hill A proposes a ground mounted solar photo-voltaic plant and associated electrical infrastructure and access.

1.8.2 An Outline Landscape and Ecological Management Plan (OLEMP) [EN010170/APP/GH7.4] has been developed to support the DCO application, and details that the vast majority of the Site is proposed to be utilised for solar panels, supporting infrastructure, internal access and peripheral areas will comprise landscaped buffers in line with the embedded mitigation described throughout the ES.

2. Assessment of Flood Risk

The aim of this section of the report is to assess and summarise the existing flood risk at Green Hill A.

2.1 Fluvial Flood Risk

2.1.1 The site is situated within Flood Zone 1, an area considered to have a 0.1% chance or lower of flooding from rivers or the sea.

2.1.2 A network of land drainage ditches is located within Green Hill A. Flows within the ditches are expected to follow a south-westerly direction, based on the local topography. All of the land drains are classified as ordinary watercourses. These fall under the regulatory remit of the LLFA, which has permissive powers to manage flood risk but is not responsible for routine maintenance. Maintenance responsibilities lie with the riparian landowners. By contrast, Main Rivers fall under the responsibility of the EA.

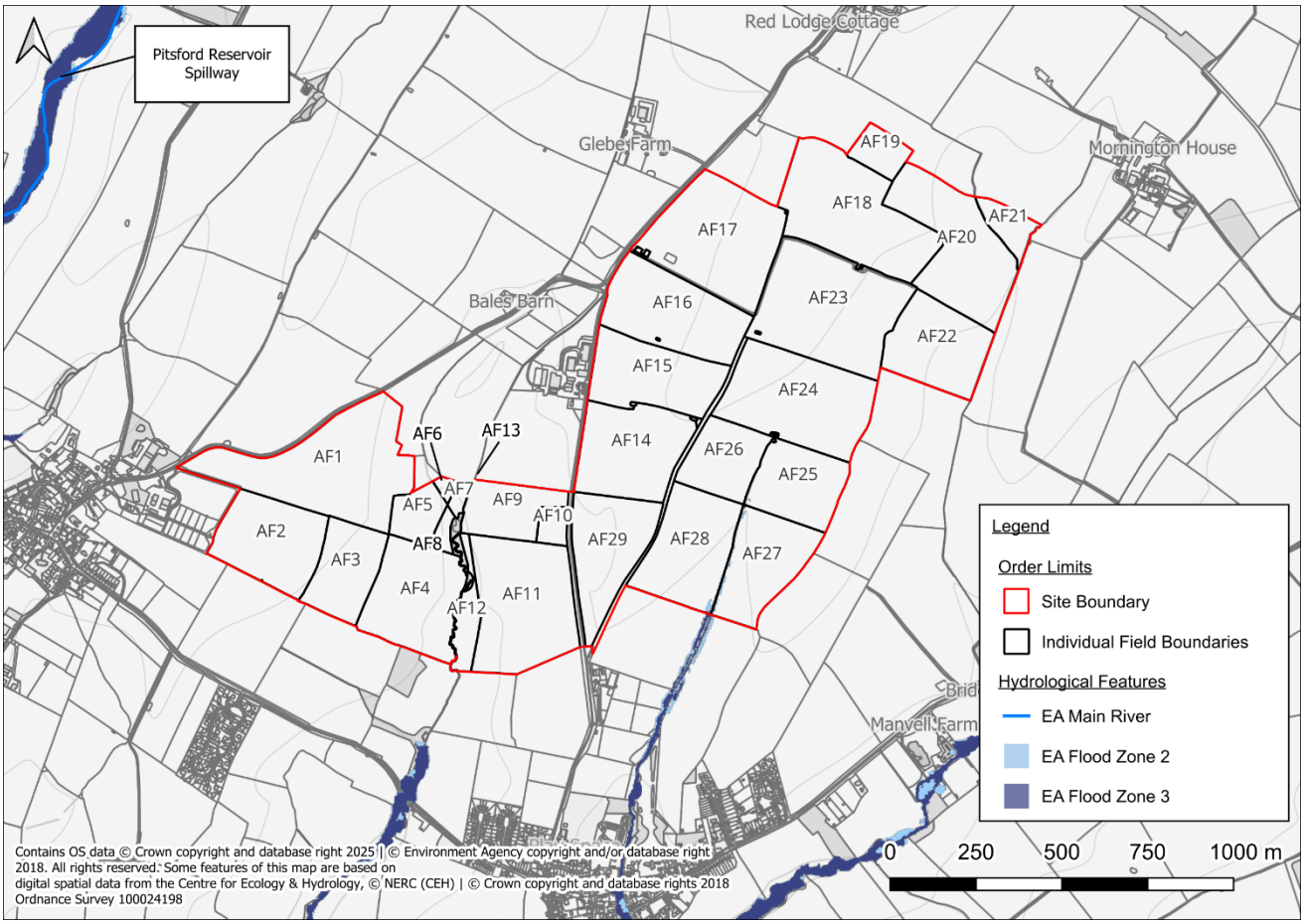

Figure 5: EA's Flood Map for Planning

2.1.3 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.

2.1.4 According to the EA's Flood Map for Planning[v] (updated March 2025), the entirety of the Green Hill A is

situated in Flood Zone 1 (has less than a 1 in 1,000 annual probability of river or sea flooding), with the exception of a small isolated area (Fields AF25 – 28) where the flood extents encroach slightly into the Site boundary. However, these extents remain outside of any areas of proposed development.

2.1.5 The EA 'Historical Flood Map' indicates that Green Hill A has no recorded history of flooding either on the Site or in the immediate vicinity. However, this does not necessarily mean that the Site has never flooded, only that there is no documented record of such events.

2.1.6 In the absence of modelled flood data, surface water flood maps can be used as a proxy to provide an understanding of potential fluvial flood risk. Surface water mapping indicates that there is a flow route associated with the drainage ditch that bisects Green Hill A which flows in a south-westerly direction. In addition, the Manning's open channel flow formula has been used to demonstrate and quantify potential fluvial flood risk to the Site during a 1% AEP +36%CC fluvial event. Cross sections of existing watercourses and the wider floodplain have been extracted from EA LiDAR data (flown Q1 2020) and used to inform the calculations. More detail on these calculations is provided in Annex B. The flood levels estimated by the calculations suggest that the flood extent is low and that flood extents on Site would be similar to or smaller than the EA surface water flood extents, which could therefore be used as a conservative proxy for fluvial flood risk.

Consultation

2.1.7 As Green Hill A is located within Flood Zone 1, the EA will not provide any Product Data, therefore Product Data was not requested from the EA. The North Northamptonshire LLFA was initially contacted in February 2024. A response was received in April 2024 and is included in Annex C. Further to this, the EA and LLFA were consulted with throughout the pre-application process, with guidance complied with where required.

2.1.8 Green Hill A is not located within an IDB.

Summary

2.1.9 Green Hill A is therefore considered to be at **Low** risk of fluvial flooding, the proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately located out of the flood zone and waterproofed.

2.2 Surface Water Flood Risk

2.2.1 The EA's National Flood Risk Assessment Mapping (NaFRA), known as the Long Term Flood Risk Map (Surface Water)[vi] was updated in January 2025. The NaFRA mapping provides an updated view of surface water flooding across the Site, however it should be noted that at the time of writing, the NaFRA mapping only delivers climate change insight up to the year 2060.

2.2.2 The previous EA 'Risk of Flooding from Surface Water' (RoFSW) mapping indicates that Green Hill A ranges from a Very Low risk (<0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to Medium risk of surface water flooding (between a 3.3% and 1% annual probability) to High risk of surface water flooding (greater than 3.3% annual probability). The majority of Green Hill A is at Very Low risk (<0.1% annual probability), with Low risk (0.1% annual probability) areas

scattered in numerous fields. Medium (0.1% to 1% annual probability) and High (1% to 3.3% annual probability) risk surface water flooding is situated along the eastern boundaries of Fields AF21, AF20, AF22, AF8, AF4 and AF5, and along the western boundaries of Fields AF12, AF7 and AF6.

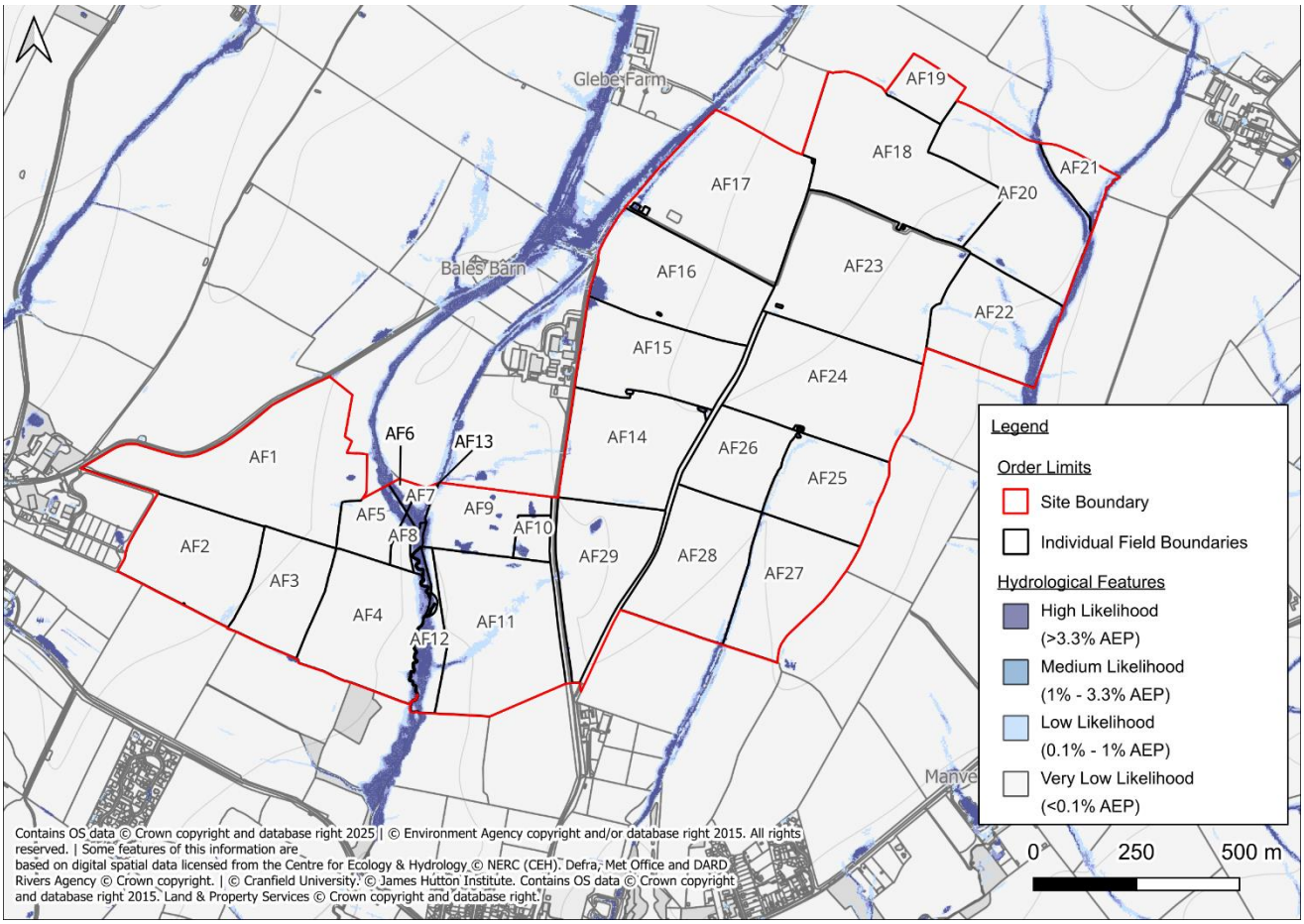

Figure 6: EA's Long-Term Flood Risk Map (Flood Risk from Surface Water)

2.2.3 The updated NaFRA mapping (Figure 6) has been assessed and indicates that there is no visible change in surface water risk across Green Hill A. As described in the fluvial section above, the surface water flooding extents largely correspond with the land drainage ditches which flow throughout Green Hill A. The mapping indicates that there is a flow route associated with the drainage ditch that bisects Green Hill A which flows in a south-westerly direction, along with some other minor flow routes.

2.2.4 NaFRA surface water mapping indicates that the majority of Green Hill A is subject to flood depths of below 0.3m. Surface water depths of less than 0.3m are typically passable by both vehicles and pedestrians. Flood depths above 0.3m are indicated during all risk scenarios along the boundaries of Fields AF4 to AF9, AF12, AF13 and AF20 to AF22. The risk reflects the drainage ditches situated along the field boundaries. There is also flood depths greater than 0.3m during all risk scenarios in the southwest of AF10. However, the solar panels have been located outside of the areas within the Fields shown to be impacted by surface water flooding.

2.2.5 There is no indication within relevant third party reports (listed in 'Sources of Information' on the Covering Report) to suggest that Green Hill A has historically experienced surface water flooding.

2.2.6 Based on the above and considering the embedded mitigation as part of the design of the solar panels, the overall risk of surface water flooding at Green Hill A is considered to be **Low**. The proposed solar panels will be raised above surrounding ground levels and will be appropriately located out of the flood zone and waterproofed thereby reducing the potential to be impacted in the event of surface water flooding.

2.2.7 The impact of the development on surface water risk is covered in Section 5.0 of the Covering Report to ensure that surface water risk is not exacerbated through appropriate SuDS measures.

2.3 Groundwater Flood Risk

2.3.1 A description of the geology at Green Hill A is included within section 1.0.

2.3.2 There is no information within relevant third party reports (listed 'Sources of Information' on the Covering Report) to suggest that Green Hill A has experienced historical groundwater flooding.

2.3.3 The Scheme does not include any basement structures or buildings requiring permanent occupation. Only unstaffed, above-ground supporting infrastructure is proposed, which would not be sensitive to low-level groundwater seepage.

2.3.4 It can therefore be concluded that the risk of groundwater flooding is **Low** and no specific mitigation measures are required.

2.4 Sewer Flooding

2.4.1 No Site-specific incidents of sewer flooding have been identified from relevant third-party reports. On the basis of the Site's rural setting the presence of sewerage infrastructure is unlikely. Utility records have been checked and no sewers are identified within the Site. It can therefore be concluded that the risk of sewer flooding is Low.

2.5 Reservoir and Canal Flooding

2.5.1 There are no canals within the vicinity of Green Hill A, therefore there is negligible associated flood risk.

2.5.2 The EA 'Flood Risk from Reservoirs' map shows that Green Hill A is not at risk of flooding from reservoirs.

2.5.3 It can therefore be concluded that there is a **Negligible** risk of flooding from artificial sources.

2.6 Residual Flood Risks

2.6.1 A residual risk is an exceedance event, such as greater than the 1 in 1000 year (<0.1% AEP) flood event that would overtop the land drains and potentially impact the Site. As the probability of a greater than a 0.1% AEP year flood event occurring is <0.1% in any given year, the probability is low and, therefore, no further mitigation beyond what is proposed is required.

2.6.2 In the event of the defences failing or an exceedance event occurring, the residual risk to people working within the Site can be managed through the implementation of an appropriate Site management plan, which recognises the residual risks and details what action is to be taken by staff in the event of a flood

to put occupants in a place of safety.

2.7 Summary of Flood Risk and Mitigation

2.7.1 It can be concluded that the risk to Green Hill A from all sources of flooding is **Negligible to Low**, however it would be prudent to include the below mitigation measures.

2.8 Embedded Mitigation

2.8.1 Embedded Mitigation is detailed in section 3.2 of the covering report.

2.9 Impact on Off-Site Flood Risk

2.9.1 The solar panels will be mounted on frames and raised above ground level allowing flood water to flow freely underneath. Therefore, there will be no loss of floodplain volume as a result of the Scheme and no increase in flood risk elsewhere.

2.9.2 The supporting infrastructure is insignificant in size and will not increase flood risk elsewhere.

2.9.3 Surface water management has been considered in Section 5.0 of the Covering Report.

3. Conclusions and Recommendations

3.1 Conclusions

3.1.1 The Scheme is for a ground mounted solar farm and associated infrastructure and access roads.

Flood Risk

3.1.2 Green Hill A is located within Flood Zone 1 on the Environment Agency (EA) 'Flood Map for Planning (Rivers and Sea)' – an area considered to have the lowest probability of fluvial and tidal flooding.

3.1.3 The risk of flooding from all sources has been assessed and the flood risk is considered to be **Negligible to Low** and therefore does not require Site-specific mitigation measures.

3.1.4 The solar panels will be mounted on raised frames and therefore raised above surrounding ground level allowing flood water to flow freely underneath. Therefore, there will be no loss of floodplain volume as a result of the Scheme.

3.2 Recommendations

3.2.1 Embedded Mitigation is detailed in section 3.2 of the covering report

Annex A – Pitsford Arm of the Brampton Branch Water Body Catchment Classification Summary

Pitsford Arm of the Brampton Branch Water Body Catchment Classification Summary

Classification Item	2019 Classification		2022 Classification	Cycle 3 Objectives		
	Cycle 2	Cycle 3	Cycle 3	Status	Year	Reasons
Ecological	Good	Good	Good	Good	2015	
Biological Quality Elements	Poor	Poor	Moderate	Good	2015	
Invertebrates	Poor	Poor	Moderate	Good	2015	
Macrophytes and Phytobenthos Combined	N/A	N/A	N/A	N/A	2015	Disproportionately expensive: Disproportionate burdens; Technically infeasible: No known technical solution is available
Physio-Chemical Quality Elements	High	High	Good	Good	2015	
Acid Neutralising Capacity	N/A	N/A	High	N/A		
Ammonia (Phys-Chem)	N/A	N/A	High	Good	2015	
Dissolved Oxygen	N/A	N/A	Good	Good	2015	
Phosphate	N/A	N/A	Good	Good	2015	
Temperature	N/A	N/A	High	Good	2015	
pH	High	High	High	Good	2015	
Hydromorphological Supporting Elements	N/A	N/A	N/A	N/A	2015	
Supporting Elements (surface Water)	Good	Good	Good	Good	2015	
Mitigation Measures Assessment	Good	Good	Good	Good	2015	
Specific Pollutants	High	High	High	High	2015	
Iron	High	High	High	High	2015	
Maganese	High	High	High	High	2015	
Chemical	Fail	Fail	N/A	Good	2063	Natural conditions: Chemical status recovery time; Technically infeasible: No known technical solution is available
Priority Hazardous Substances	Fail	Fail	N/A	Good	2063	Natural conditions: Chemical status recovery time; Technically infeasible: No known technical solution is available
Benzo(a)pyrene	Good	Good	N/A	Good	2015	
Dioxins and dioxin-like compounds	Good	Good	N/A	Good	2015	
Heptachlor and cis-Heptachlor Epoxide	Good	Good	N/A	Good	2015	
Hexachlorobenzene	Good	Good	N/A	Good	2015	
Hexachlorobutadiene	Good	Good	N/A	Good	2015	
Mercury and Its Compounds	Fail	Fail	N/A	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)	Fail	Fail	N/A	Good	2039	Technically infeasible: No known technical solution is available
Polybrominated diphenyl ethers (PBDE)	Fail	Fail	N/A	Good	2063	Natural conditions: Chemical status recovery time
Priority substances	Good	Good	N/A	Good	2015	
Cypermethrin (Priority)	Good	Good	N/A	Good	2015	
Fluoranthene	Good	Good	N/A	Good	2015	
Other Pollutants	N/A	N/A	N/A	N/A	2015	

Annex B - Manning’s Open Channel Flow Mapping

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Manning's Open Channel Flow Calculation - Option Area A

Methodology

Cross-sections of the channel and floodplain were extracted from Environment Agency (EA) LiDAR DTM data (flown Q1 2020) at the locations shown in Figure 1. These cross-sections can be considered representative of the channel and general floodplain adjacent to the site and at the location of the proposed development. Due to the nature of LiDAR, volume and conveyance of the main channels will likely be underestimated, providing a conservative assessment of fluvial flood risk.

The cross-sections were imported into Flood Modeller and the "tabulate cross section properties" tool was utilised to establish the level-flow relationship for the channel and wider floodplain. This tool utilises the Manning's open channel flow equation. Manning's 'n' roughness was set to 0.03s/m$^{1/3}$ for the channel and 0.04s/m$^{1/3}$ for the floodplain based on aerial imagery. The bed slope was set for each cross-section based on underlying LiDAR. Catchment descriptors for the catchments upstream of the outlet locations shown in Figure 1 were imported into ReFH2 and used to provide an estimate of flows within the channel during the 1% AEP +36%CC event. These flows were scaled by area as required.

Within this excel workbook, the xlookup function has been used along with the Flood Modeller level-flow relationship for the cross-sections to determine the equivalent water level for the calculated flow, rounding up where a direct match is not found. To provide additional confidence in the assessment, a second xlookup has been used to determine the estimated flood level should an additional 50% flow be applied.

Cross-sections have been located at suitable locations throughout the proposed development. Whilst it is acknowledged that the Manning's open channel flow equation used to determine the level-flow relationship does not constitute detailed hydraulic modelling, the calculation can still be considered suitable to demonstrate the scale of the changes in water level that can be expected when considering a +36% uplift in flows (Nene Catchment, 2080's higher allowance).

Cross-Section Locations

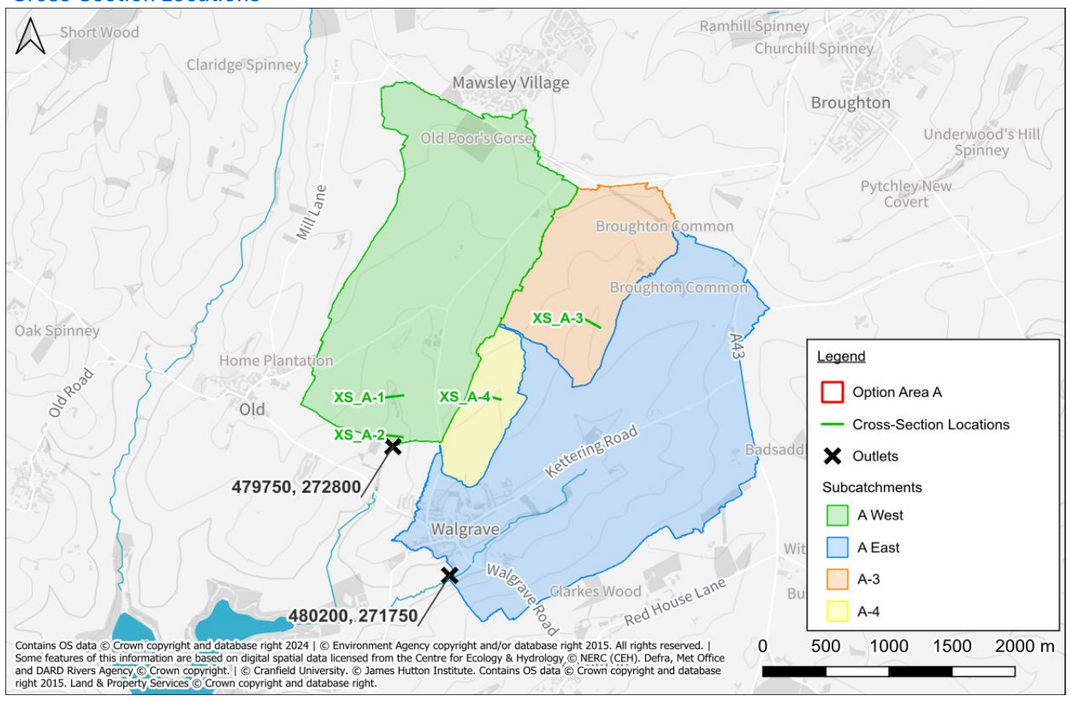


Figure 1: Cross-section locations

Calculated Flows and Levels

Cross-Section	ReFH2 Peak Flow - 1% AEP +36%CC (m^3/s)	Equivalent Flood Level (m AOD)	Sensitivity Flow - ReFH2 +50% (m^3/s)	Equivalent Flood Level (m AOD)
A-1	2.94	108.10	4.41	108.19 (+91mm)
A-2	2.94	104.24	4.41	104.31 (+61mm)
A-3	1.38	118.01	2.07	118.05 (+41mm)
A-4	0.53	118.02	0.80	118.08 (+58mm)

Tabulated Cross-Section Properties | A-1

(Calculated by Flood Modeller)

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
A-1	0.000	107.448	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0263
A-1	0.067	107.529	0.081	0.673	0.817	0.099	0.411	1.427	1.459	0.0263
A-1	0.230	107.610	0.162	0.994	0.895	0.231	1.417	1.840	1.904	0.0263
A-1	0.492	107.691	0.243	1.238	0.942	0.397	3.033	2.253	2.349	0.0263
A-1	0.862	107.772	0.324	1.447	0.977	0.596	5.321	2.666	2.794	0.0263
A-1	1.415	107.870	0.422	1.567	0.999	0.903	8.732	3.594	3.753	0.0263
A-1	1.698	107.907	0.459	1.592	1.126	1.066	10.474	5.229	5.402	0.0263
A-1	2.109	107.964	0.516	1.530	0.998	1.379	13.015	5.757	5.947	0.0263
A-1	2.710	108.009	0.561	1.645	1.016	1.647	16.719	6.164	6.370	0.0263
A-1	4.264	108.100	0.652	1.909	1.053	2.233	26.305	6.664	6.905	0.0263
A-1	6.143	108.192	0.744	2.144	1.083	2.865	37.900	7.164	7.441	0.0263
A-1	8.352	108.283	0.835	2.358	1.108	3.542	51.533	7.663	7.977	0.0263
A-1	10.543	108.367	0.919	2.505	1.124	4.209	65.046	8.318	8.660	0.0263
A-1	13.048	108.450	1.002	2.646	1.140	4.931	80.501	8.972	9.343	0.0263
A-1	13.389	108.459	1.011	2.669	1.203	5.016	82.609	10.002	10.376	0.0263
A-1	14.013	108.475	1.027	2.703	1.260	5.185	86.456	11.045	11.423	0.0263
A-1	14.050	108.476	1.028	2.704	1.342	5.197	86.685	12.568	12.946	0.0263
A-1	14.090	108.477	1.029	2.704	1.424	5.210	86.930	14.175	14.554	0.0263
A-1	14.546	108.488	1.040	2.708	1.451	5.371	89.744	15.125	15.507	0.0263
A-1	14.983	108.498	1.050	2.696	1.600	5.558	92.444	19.200	19.584	0.0263
A-1	15.652	108.512	1.064	2.683	1.595	5.834	96.571	20.238	20.626	0.0263
A-1	17.093	108.539	1.091	2.676	1.540	6.388	105.458	20.758	21.154	0.0263
A-1	19.022	108.570	1.122	2.698	1.523	7.051	117.364	22.048	22.446	0.0263
A-1	19.295	108.575	1.127	2.692	1.554	7.167	119.047	23.414	23.812	0.0263
A-1	19.495	108.578	1.130	2.692	1.618	7.241	120.282	25.654	26.052	0.0263
A-1	19.698	108.581	1.133	2.691	1.647	7.320	121.533	26.913	27.311	0.0263
A-1	20.468	108.592	1.144	2.686	1.631	7.620	126.286	27.544	27.942	0.0263
A-1	20.781	108.597	1.149	2.678	1.642	7.760	128.216	28.614	29.013	0.0263
A-1	23.708	108.633	1.185	2.689	1.585	8.816	146.270	30.034	30.435	0.0263
A-1	26.923	108.668	1.220	2.722	1.549	9.891	166.106	31.443	31.846	0.0263
A-1	30.486	108.703	1.255	2.766	1.530	11.020	188.090	33.059	33.463	0.0263
A-1	33.213	108.727	1.279	2.809	1.516	11.822	204.916	33.775	34.182	0.0263
A-1	39.693	108.779	1.331	2.914	1.501	13.622	244.896	35.449	35.859	0.0263
A-1	40.196	108.783	1.335	2.920	1.503	13.764	248.003	35.753	36.163	0.0263
A-1	41.727	108.795	1.347	2.939	1.509	14.199	257.447	36.720	37.131	0.0263
A-1	48.479	108.842	1.394	3.036	1.505	15.966	299.107	38.464	38.877	0.0263
A-1	49.092	108.846	1.398	3.045	1.504	16.120	302.887	38.596	39.009	0.0263
A-1	52.770	108.870	1.422	3.093	1.510	17.063	325.576	39.926	40.340	0.0263
A-1	61.106	108.919	1.471	3.206	1.511	19.057	377.009	41.492	41.910	0.0263

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
A-1	61.994	108.924	1.476	3.218	1.511	19.265	382.491	41.661	42.079	0.0263
A-1	72.488	108.980	1.532	3.348	1.515	21.650	447.234	43.510	43.931	0.0263
A-1	73.822	108.987	1.539	3.362	1.517	21.956	455.468	43.867	44.289	0.0263
A-1	77.916	109.008	1.560	3.404	1.523	22.888	480.727	44.961	45.383	0.0263
A-1	79.897	109.019	1.571	3.416	1.532	23.389	492.948	46.150	46.573	0.0263
A-1	86.908	109.051	1.603	3.493	1.533	24.880	536.201	47.006	47.432	0.0263
A-1	100.917	109.111	1.663	3.637	1.538	27.750	622.634	48.675	49.105	0.0263
A-1	101.166	109.112	1.664	3.639	1.538	27.799	624.173	48.698	49.128	0.0263
A-1	107.379	109.138	1.690	3.692	1.546	29.082	662.503	50.011	50.443	0.0263
A-1	123.777	109.199	1.751	3.846	1.554	32.180	763.674	51.561	51.998	0.0263
A-1	127.199	109.211	1.763	3.878	1.556	32.800	784.789	51.832	52.270	0.0263
A-1	144.926	109.271	1.823	4.031	1.568	35.957	894.164	53.367	53.810	0.0263
A-1	159.308	109.316	1.868	4.151	1.575	38.377	982.897	54.200	54.648	0.0263
A-1	178.762	109.374	1.926	4.302	1.585	41.553	1102.924	55.337	55.791	0.0263
A-1	195.194	109.420	1.972	4.425	1.593	44.116	1204.304	56.076	56.535	0.0263
A-1	226.665	109.504	2.056	4.636	1.607	48.891	1398.473	57.619	58.088	0.0263
A-1	238.892	109.535	2.087	4.713	1.612	50.686	1473.909	58.188	58.662	0.0263
A-1	260.362	109.588	2.140	4.840	1.622	53.799	1606.380	59.276	59.755	0.0263
A-1	288.812	109.655	2.207	4.995	1.634	57.817	1781.909	60.681	61.166	0.0263
A-1	294.827	109.669	2.221	5.025	1.636	58.669	1819.017	61.036	61.522	0.0263
A-1	320.629	109.729	2.281	5.140	1.647	62.385	1978.209	62.822	63.312	0.0263
A-1	322.857	109.734	2.286	5.149	1.648	62.700	1991.959	62.965	63.456	0.0263
A-1	349.825	109.793	2.345	5.263	1.657	66.464	2158.342	64.657	65.152	0.0263
A-1	358.790	109.813	2.365	5.295	1.660	67.765	2213.658	65.375	65.871	0.0263
A-1	369.802	109.837	2.389	5.333	1.664	69.344	2281.597	66.218	66.715	0.0263
A-1	394.508	109.888	2.440	5.422	1.672	72.763	2434.030	67.848	68.349	0.0263
A-1	398.860	109.897	2.449	5.436	1.673	73.375	2460.878	68.169	68.671	0.0263
A-1	415.703	109.931	2.483	5.491	1.678	75.712	2564.796	69.342	69.846	0.0263
A-1	448.229	109.990	2.542	5.614	1.687	79.845	2765.479	70.763	71.272	0.0263
A-1	457.910	110.008	2.560	5.645	1.690	81.125	2825.208	71.365	71.875	0.0263
A-1	471.978	110.038	2.590	5.667	1.694	83.290	2912.004	72.987	73.499	0.0263
A-1	473.089	110.040	2.592	5.670	1.694	83.436	2918.859	73.055	73.567	0.0263
A-1	516.619	110.112	2.664	5.821	1.705	88.756	3187.425	74.725	75.243	0.0263
A-1	526.430	110.128	2.680	5.852	1.708	89.955	3247.959	75.130	75.649	0.0263
A-1	538.223	110.147	2.699	5.889	1.728	91.402	3320.722	77.193	77.714	0.0263
A-1	541.503	110.162	2.714	5.850	1.713	92.565	3340.954	77.878	78.400	0.0263
A-1	550.211	110.176	2.728	5.875	1.715	93.659	3394.683	78.322	78.845	0.0263
A-1	582.161	110.226	2.778	5.964	1.722	97.613	3591.811	79.871	80.397	0.0263
A-1	593.516	110.243	2.795	5.997	1.725	98.975	3661.868	80.326	80.853	0.0263
A-1	639.489	110.310	2.862	6.124	1.734	104.417	3945.510	82.121	82.653	0.0263
A-1	641.690	110.313	2.865	6.131	1.735	104.664	3959.091	82.183	82.715	0.0263
A-1	691.694	110.381	2.933	6.271	1.745	110.306	4267.605	83.798	84.336	0.0263
A-1	722.095	110.423	2.975	6.342	1.751	113.855	4455.172	85.182	85.724	0.0263
A-1	723.578	110.425	2.977	6.346	1.752	114.026	4464.320	85.246	85.788	0.0263
A-1	752.349	110.467	3.019	6.395	1.757	117.645	4641.829	87.083	87.627	0.0263
A-1	757.272	110.474	3.026	6.404	1.757	118.255	4672.205	87.379	87.923	0.0263
A-1	787.652	110.514	3.066	6.468	1.763	121.778	4859.643	88.755	89.302	0.0263
A-1	818.293	110.553	3.105	6.533	1.768	125.264	5048.688	90.032	90.582	0.0263
A-1	828.133	110.565	3.117	6.554	1.770	126.347	5109.401	90.381	90.931	0.0263
A-1	909.289	110.657	3.209	6.748	1.783	134.747	5610.116	92.236	92.796	0.0263
A-1	915.246	110.664	3.216	6.760	1.784	135.394	5646.870	92.458	93.018	0.0263
A-1	946.999	110.702	3.254	6.816	1.788	138.933	5842.780	93.814	94.377	0.0263
A-1	970.994	110.732	3.284	6.849	1.792	141.768	5990.824	95.225	95.789	0.0263
A-1	979.301	110.741	3.293	6.866	1.793	142.626	6042.078	95.437	96.002	0.0263
A-1	1044.641	110.811	3.363	6.994	1.801	149.368	6445.210	97.183	97.753	0.0263
A-1	1062.478	110.829	3.381	7.031	1.803	151.121	6555.261	97.542	98.114	0.0263
A-1	1126.413	110.894	3.446	7.151	1.812	157.513	6949.724	99.172	99.749	0.0263
A-1	1147.871	110.918	3.470	7.178	1.815	159.907	7082.116	100.268	100.848	0.0263
A-1	1151.241	110.922	3.474	7.181	1.815	160.308	7102.908	100.482	101.061	0.0263
A-1	1189.968	110.964	3.516	7.231	1.820	164.565	7341.848	102.219	102.801	0.0263
A-1	1202.868	110.977	3.529	7.251	1.821	165.896	7421.435	102.629	103.211	0.0263
A-1	1258.274	111.030	3.582	7.342	1.827	171.374	7763.279	104.057	104.644	0.0263
A-1	1263.580	111.035	3.587	7.351	1.837	171.898	7796.015	105.294	105.881	0.0263
A-1	1280.523	111.057	3.609	7.350	1.830	174.221	7900.548	105.958	106.546	0.0263
A-1	1315.868	111.088	3.640	7.413	1.834	177.516	8118.624	106.633	107.226	0.0263
A-1	1383.365	111.146	3.698	7.529	1.842	183.738	8535.064	107.896	108.498	0.0263
A-1	1457.868	111.208	3.760	7.654	1.850	190.467	8994.729	109.177	109.787	0.0263
A-1	1539.794	111.274	3.826	7.788	1.859	197.715	9500.199	110.474	111.094	0.0263
A-1	1563.082	111.293	3.845	7.823	1.861	199.819	9643.877	110.958	111.580	0.0263
A-1	1597.212	111.322	3.874	7.866	1.864	203.050	9854.450	111.874	112.499	0.0263
A-1	1623.822	111.347	3.899	7.888	1.867	205.863	10018.630	113.150	113.776	0.0263
A-1	1677.007	111.390	3.942	7.957	1.871	210.754	10346.772	114.365	114.994	0.0263
A-1	1694.476	111.404	3.956	7.979	1.873	212.358	10454.549	114.767	115.397	0.0263
A-1	1798.272	111.483	4.035	8.119	1.880	221.496	11094.949	116.560	117.197	0.0263
A-1	1807.486	111.490	4.042	8.130	1.881	222.312	11151.801	116.731	117.369	0.0263
A-1	1876.763	111.544	4.096	8.208	1.886	228.661	11579.225	118.430	119.072	0.0263
A-1	1902.454	111.563	4.115	8.239	1.888	230.917	11737.730	118.906	119.549	0.0263
A-1	1993.601	111.626	4.178	8.361	1.894	238.444	12300.088	120.087	120.737	0.0263
A-1	2054.838	111.670	4.222	8.430	1.899	243.756	12677.904	121.381	122.036	0.0263
A-1	2091.462	111.698	4.250	8.462	1.902	247.172	12903.867	122.575	123.232	0.0263
A-1	2126.360	111.722	4.274	8.501	1.905	250.122	13119.181	123.215	123.875	0.0263
A-1	2160.547	111.748	4.300	8.528	1.907	253.338	13330.106	124.222	124.883	0.0263
A-1	2199.917	111.777	4.329	8.561	1.908	256.956	13573.011	125.255	125.918	0.0263
A-1	2244.016	111.807	4.359	8.607	1.911	260.726	13845.095	126.105	126.770	0.0263
A-1	2337.177	111.868	4.420	8.706	1.916	268.464	14419.875	127.610	128.280	0.0263
A-1	2358.120	111.882	4.434	8.726	1.917	270.254	14549.090	128.011	128.682	0.0263
A-1	2416.025	111.923	4.475	8.768	1.920	275.535	14906.353	129.646	130.320	0.0263
A-1	2430.899	111.935	4.487	8.773	1.921	277.096	14998.119	130.381	131.055	0.0263
A-1	2443.734	111.945	4.497	8.778	1.922	278.403	15077.311	130.969	131.643	0.0263
A-1	2564.294	112.015	4.567	8.916	1.928	287.601	15821.141	131.857	132.534	0.0263
A-1	2637.154	112.060	4.612	8.983	1.930	293.558	16270.668	132.871	133.549	0.0263
A-1	2715.390	112.107	4.659	9.057	1.932	299.827	16753.367	133.885	134.564	0.0263
A-1	2799.140	112.156	4.708	9.135	1.935	306.412	17270.092	134.899	135.579	0.0263
A-1	2855.814	112.191	4.743	9.178	1.937	311.151	17619.758	135.914	136.595	0.0263
A-1	2965.424	112.251	4.803	9.286	1.941	319.336	18296.025	136.928	137.611	0.0263
A-1	2996.867	112.273	4.825	9.297	1.942	322.360	18490.020	137.942	138.625	0.0263
A-1	3033.091	112.297	4.849	9.313	1.942	325.682	18713.516	138.957	139.640	0.0263
A-1	3108.682	112.339	4.891	9.376	1.945	331.540	19179.895	139.971	140.655	0.0263
A-1	3148.395	112.364	4.916	9.397	1.946	335.052	19424.914	140.985	141.669	0.0263

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
A-1	3237.431	112.410	4.962	9.478	1.950	341.557	19974.250	141.833	142.519	0.0263
A-1	3255.002	112.419	4.971	9.494	1.960	342.840	20082.658	143.290	143.977	0.0263
A-1	3279.768	112.443	4.995	9.471	1.950	346.288	20235.457	144.028	144.714	0.0263

Tabulated Cross-Section Properties | A-2

(Calculated by Flood Modeller)

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
A-2	0.000	103.875	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0162
A-2	0.001	103.880	0.005	0.076	0.399	0.008	0.005	2.121	2.121	0.0162
A-2	0.011	103.897	0.022	0.202	0.509	0.055	0.088	3.459	3.459	0.0162
A-2	0.066	103.928	0.053	0.367	0.592	0.180	0.519	4.574	4.577	0.0162
A-2	0.159	103.957	0.082	0.491	0.636	0.323	1.248	5.319	5.324	0.0162
A-2	0.671	104.043	0.168	0.812	0.720	0.826	5.276	6.381	6.402	0.0162
A-2	0.617	104.044	0.169	0.740	0.704	0.833	4.849	7.397	7.419	0.0162
A-2	0.602	104.048	0.173	0.696	0.693	0.865	4.732	8.424	8.447	0.0162
A-2	0.963	104.086	0.211	0.798	0.717	1.207	7.570	9.571	9.600	0.0162
A-2	2.125	104.165	0.290	1.071	0.771	1.983	16.709	10.084	10.136	0.0162
A-2	3.648	104.244	0.369	1.303	0.809	2.800	28.687	10.597	10.673	0.0162
A-2	5.077	104.305	0.430	1.467	0.833	3.461	39.923	10.942	11.039	0.0162
A-2	6.703	104.367	0.492	1.618	0.853	4.142	52.713	11.287	11.405	0.0162
A-2	8.522	104.428	0.553	1.759	0.870	4.845	67.021	11.632	11.772	0.0162
A-2	10.682	104.493	0.618	1.902	0.887	5.616	84.006	11.969	12.134	0.0162
A-2	13.055	104.559	0.684	2.037	0.901	6.409	102.661	12.307	12.496	0.0162
A-2	15.637	104.624	0.749	2.164	0.914	7.224	122.966	12.645	12.859	0.0162
A-2	15.713	104.626	0.751	2.168	0.915	7.249	123.570	12.663	12.877	0.0162
A-2	15.868	104.630	0.755	2.173	0.964	7.303	124.784	14.115	14.330	0.0162
A-2	16.103	104.636	0.761	2.179	1.003	7.392	126.631	15.383	15.600	0.0162
A-2	16.262	104.640	0.765	2.180	1.049	7.458	127.882	16.934	17.152	0.0162
A-2	16.547	104.647	0.772	2.184	1.054	7.578	130.126	17.322	17.542	0.0162
A-2	17.850	104.677	0.802	2.189	1.122	8.153	140.376	21.009	21.240	0.0162
A-2	17.883	104.678	0.803	2.188	1.147	8.175	140.634	22.053	22.284	0.0162
A-2	18.263	104.686	0.811	2.187	1.143	8.352	143.621	22.381	22.614	0.0162
A-2	19.624	104.713	0.838	2.186	1.139	8.977	154.321	23.908	24.150	0.0162
A-2	19.931	104.719	0.844	2.185	1.150	9.123	156.741	24.782	25.026	0.0162
A-2	20.036	104.721	0.846	2.184	1.180	9.174	157.560	26.288	26.533	0.0162
A-2	20.445	104.729	0.854	2.178	1.185	9.388	160.784	27.251	27.498	0.0162
A-2	21.132	104.741	0.866	2.173	1.188	9.723	166.182	28.491	28.742	0.0162
A-2	22.300	104.760	0.885	2.170	1.181	10.277	175.371	29.865	30.123	0.0162
A-2	22.659	104.766	0.891	2.166	1.191	10.460	178.189	30.992	31.252	0.0162
A-2	22.891	104.770	0.895	2.162	1.202	10.586	180.012	32.081	32.342	0.0162
A-2	23.302	104.776	0.901	2.162	1.196	10.779	183.245	32.386	32.649	0.0162
A-2	24.111	104.788	0.913	2.157	1.199	11.177	189.608	33.883	34.149	0.0162
A-2	24.347	104.791	0.916	2.159	1.198	11.279	191.469	34.088	34.355	0.0162
A-2	25.235	104.802	0.927	2.164	1.207	11.662	198.451	35.592	35.863	0.0162
A-2	25.345	104.804	0.929	2.160	1.221	11.735	199.316	36.816	37.087	0.0162
A-2	25.855	104.810	0.935	2.162	1.223	11.958	203.328	37.556	37.830	0.0162
A-2	27.451	104.828	0.953	2.170	1.220	12.649	215.879	39.192	39.472	0.0162
A-2	27.820	104.832	0.957	2.172	1.219	12.806	218.775	39.542	39.823	0.0162
A-2	30.520	104.859	0.984	2.194	1.224	13.913	240.014	42.489	42.775	0.0162
A-2	32.154	104.874	0.999	2.209	1.220	14.559	252.862	43.558	43.846	0.0162
A-2	35.163	104.900	1.025	2.238	1.210	15.710	276.524	45.031	45.323	0.0162
A-2	37.871	104.922	1.047	2.265	1.210	16.721	297.820	46.847	47.142	0.0162
A-2	38.611	104.929	1.054	2.264	1.217	17.054	303.641	48.342	48.638	0.0162
A-2	39.502	104.937	1.062	2.264	1.231	17.450	310.641	50.640	50.936	0.0162
A-2	43.244	104.965	1.090	2.290	1.209	18.881	340.070	51.592	51.890	0.0162
A-2	44.151	104.971	1.096	2.301	1.206	19.191	347.204	51.756	52.055	0.0162
A-2	49.513	105.005	1.130	2.360	1.202	20.978	389.369	53.343	53.643	0.0162
A-2	52.881	105.025	1.150	2.398	1.198	22.051	415.859	53.961	54.263	0.0162
A-2	56.688	105.047	1.172	2.438	1.200	23.253	445.798	55.284	55.586	0.0162
A-2	62.288	105.077	1.202	2.499	1.197	24.923	489.835	56.051	56.356	0.0162
A-2	74.011	105.135	1.260	2.623	1.197	28.220	582.021	57.651	57.960	0.0162
A-2	75.079	105.140	1.265	2.634	1.197	28.509	590.426	57.773	58.082	0.0162
A-2	91.942	105.214	1.339	2.799	1.202	32.844	723.034	59.405	59.722	0.0162
A-2	102.330	105.256	1.381	2.894	1.208	35.361	804.730	60.432	60.753	0.0162
A-2	107.679	105.277	1.402	2.939	1.212	36.638	846.793	61.143	61.465	0.0162
A-2	117.221	105.313	1.438	3.017	1.219	38.860	921.830	62.297	62.621	0.0162
A-2	127.041	105.348	1.473	3.094	1.225	41.055	999.054	63.147	63.474	0.0162
A-2	146.734	105.414	1.539	3.241	1.236	45.271	1153.917	64.624	64.957	0.0162
A-2	151.726	105.430	1.555	3.276	1.239	46.308	1193.181	64.987	65.322	0.0162
A-2	177.636	105.509	1.634	3.448	1.254	51.514	1396.932	66.816	67.157	0.0162
A-2	178.652	105.512	1.637	3.455	1.254	51.715	1404.926	66.902	67.244	0.0162
A-2	196.729	105.564	1.689	3.562	1.266	55.235	1547.078	68.465	68.810	0.0162
A-2	209.238	105.599	1.724	3.629	1.276	57.655	1645.452	69.885	70.232	0.0162
A-2	233.141	105.662	1.787	3.753	1.288	62.120	1833.431	71.823	72.174	0.0162
A-2	235.501	105.668	1.793	3.765	1.290	62.551	1851.987	71.997	72.348	0.0162
A-2	262.056	105.733	1.858	3.895	1.301	67.284	2060.818	73.632	73.989	0.0162
A-2	273.795	105.761	1.886	3.948	1.306	69.358	2153.128	74.493	74.852	0.0162
A-2	283.635	105.784	1.909	3.990	1.311	71.079	2230.511	75.221	75.581	0.0162
A-2	307.578	105.838	1.963	4.091	1.321	75.185	2418.798	76.870	77.234	0.0162
A-2	311.759	105.847	1.972	4.109	1.322	75.878	2451.682	77.072	77.437	0.0162
A-2	346.093	105.919	2.044	4.247	1.334	81.492	2721.681	78.852	79.223	0.0162
A-2	352.788	105.933	2.058	4.271	1.337	82.599	2774.337	79.384	79.756	0.0162
A-2	363.180	105.956	2.081	4.301	1.344	84.442	2856.060	80.845	81.218	0.0162
A-2	365.540	105.961	2.086	4.308	1.345	84.847	2874.614	81.102	81.474	0.0162
A-2	397.528	106.023	2.148	4.420	1.355	89.930	3126.173	82.865	83.243	0.0162
A-2	404.973	106.037	2.162	4.446	1.357	91.093	3184.716	83.246	83.625	0.0162
A-2	437.369	106.096	2.221	4.554	1.365	96.047	3439.482	84.708	85.091	0.0162
A-2	456.749	106.130	2.255	4.616	1.370	98.940	3591.886	85.461	85.847	0.0162
A-2	483.426	106.177	2.302	4.694	1.377	102.993	3801.674	87.003	87.392	0.0162
A-2	488.793	106.186	2.311	4.710	1.379	103.777	3843.878	87.206	87.597	0.0162
A-2	538.298	106.266	2.391	4.858	1.388	110.814	4233.191	88.736	89.134	0.0162
A-2	571.022	106.317	2.442	4.950	1.394	115.366	4490.532	89.759	90.164	0.0162
A-2	591.338	106.348	2.473	5.005	1.398	118.159	4650.295	90.410	90.818	0.0162
A-2	629.704	106.406	2.531	5.101	1.405	123.446	4952.012	91.926	92.338	0.0162
A-2	648.771	106.434	2.559	5.148	1.409	126.030	5101.952	92.625	93.040	0.0162
A-2	672.182	106.468	2.593	5.203	1.414	129.195	5286.058	93.547	93.964	0.0162
A-2	715.830	106.528	2.653	5.309	1.420	134.841	5629.305	94.650	95.074	0.0162

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
A-2	759.987	106.588	2.713	5.407	1.427	140.564	5976.561	96.120	96.550	0.0162
A-2	769.673	106.601	2.726	5.427	1.429	141.816	6052.730	96.467	96.898	0.0162
A-2	799.694	106.641	2.766	5.489	1.434	145.698	6288.817	97.614	98.048	0.0162
A-2	851.874	106.707	2.832	5.598	1.442	152.187	6699.162	99.032	99.472	0.0162
A-2	866.954	106.726	2.851	5.627	1.444	154.073	6817.752	99.522	99.963	0.0162
A-2	910.458	106.780	2.905	5.709	1.450	159.486	7159.870	100.972	101.418	0.0162
A-2	930.567	106.804	2.929	5.747	1.453	161.916	7318.003	101.499	101.947	0.0162
A-2	987.507	106.871	2.996	5.851	1.460	168.771	7765.779	103.112	103.566	0.0162
A-2	1006.820	106.893	3.018	5.886	1.462	171.044	7917.663	103.571	104.027	0.0162
A-2	1043.801	106.937	3.062	5.943	1.468	175.635	8208.477	105.108	105.567	0.0162
A-2	1059.843	106.956	3.081	5.966	1.470	177.639	8334.635	105.828	106.288	0.0162
A-2	1076.986	106.976	3.101	5.991	1.473	179.763	8469.447	106.562	107.024	0.0162
A-2	1146.772	107.050	3.175	6.110	1.479	187.701	9018.242	107.980	108.449	0.0162
A-2	1191.173	107.097	3.222	6.178	1.484	192.804	9367.419	109.180	109.653	0.0162
A-2	1202.922	107.109	3.234	6.197	1.485	194.116	9459.814	109.424	109.899	0.0162
A-2	1265.064	107.170	3.295	6.301	1.490	200.757	9948.500	110.121	110.609	0.0162
A-2	1328.699	107.230	3.355	6.405	1.495	207.441	10448.925	110.817	111.319	0.0162
A-2	1388.212	107.286	3.411	6.499	1.499	213.611	10916.934	111.499	112.012	0.0162
A-2	1448.967	107.341	3.466	6.592	1.503	219.817	11394.715	112.180	112.704	0.0162
A-2	1535.756	107.419	3.544	6.718	1.510	228.610	12077.225	113.293	113.834	0.0162
A-2	1550.031	107.432	3.557	6.737	1.511	230.085	12189.482	113.555	114.096	0.0162
A-2	1587.002	107.468	3.593	6.776	1.515	234.197	12480.228	114.889	115.434	0.0162
A-2	1659.978	107.532	3.657	6.871	1.521	241.587	13054.107	116.069	116.620	0.0162
A-2	1710.066	107.575	3.700	6.935	1.524	246.595	13448.007	116.845	117.401	0.0162
A-2	1780.152	107.635	3.760	7.018	1.529	253.645	13999.161	118.139	118.700	0.0162
A-2	1797.912	107.650	3.775	7.039	1.539	255.429	14138.824	119.746	120.310	0.0162
A-2	1801.648	107.653	3.778	7.044	1.539	255.788	14168.209	119.840	120.404	0.0162
A-2	1849.098	107.691	3.816	7.102	1.546	260.365	14541.355	121.069	121.636	0.0162
A-2	1888.296	107.722	3.847	7.149	1.554	264.140	14849.608	122.435	123.003	0.0162
A-2	1890.839	107.724	3.849	7.152	1.559	264.385	14869.611	123.276	123.845	0.0162
A-2	1892.105	107.725	3.850	7.153	1.562	264.509	14879.561	123.698	124.267	0.0162
A-2	1921.347	107.748	3.873	7.186	1.568	267.368	15109.525	124.953	125.522	0.0162
A-2	1962.496	107.780	3.905	7.231	1.576	271.391	15433.121	126.464	127.034	0.0162
A-2	1974.172	107.789	3.914	7.244	1.577	272.531	15524.938	126.776	127.347	0.0162
A-2	2033.979	107.833	3.958	7.313	1.583	278.134	15995.261	127.929	128.504	0.0162
A-2	2040.770	107.838	3.963	7.320	1.590	278.776	16048.666	128.977	129.553	0.0162
A-2	2139.529	107.909	4.034	7.429	1.597	287.987	16825.313	130.493	131.076	0.0162
A-2	2171.991	107.932	4.057	7.464	1.602	291.001	17080.596	131.519	132.104	0.0162
A-2	2177.441	107.936	4.061	7.469	1.603	291.527	17123.451	131.731	132.317	0.0162
A-2	2261.828	107.997	4.122	7.549	1.610	299.621	17787.078	133.647	134.236	0.0162
A-2	2266.016	108.000	4.125	7.553	1.610	300.022	17820.008	133.742	134.332	0.0162
A-2	2350.840	108.060	4.185	7.630	1.615	308.099	18487.070	135.485	136.079	0.0162
A-2	2376.911	108.078	4.203	7.654	1.617	310.543	18692.090	135.972	136.567	0.0162
A-2	2445.628	108.125	4.250	7.716	1.623	316.972	19232.480	137.646	138.244	0.0162
A-2	2455.990	108.132	4.257	7.725	1.624	317.937	19313.975	137.834	138.432	0.0162
A-2	2572.740	108.205	4.330	7.843	1.629	328.032	20232.096	138.758	139.359	0.0162
A-2	2650.227	108.253	4.378	7.920	1.631	334.635	20841.451	139.264	139.868	0.0162
A-2	2728.865	108.300	4.425	7.996	1.634	341.263	21459.865	139.771	140.377	0.0162

Tabulated Cross-Section Properties | A-3

(Calculated by Flood Modeller)

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
A-3	0.000	117.485	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0150
A-3	0.006	117.548	0.063	0.300	0.540	0.019	0.046	0.604	0.617	0.0150
A-3	0.036	117.610	0.125	0.476	0.607	0.076	0.294	1.207	1.235	0.0150
A-3	0.106	117.673	0.188	0.623	0.649	0.170	0.866	1.810	1.852	0.0150
A-3	0.257	117.744	0.259	0.820	0.692	0.313	2.097	2.187	2.257	0.0150
A-3	0.474	117.816	0.331	0.981	0.721	0.483	3.869	2.564	2.663	0.0150
A-3	0.722	117.893	0.408	0.989	0.725	0.730	5.895	3.855	3.977	0.0150
A-3	1.052	117.958	0.473	1.032	0.734	1.020	8.596	5.074	5.214	0.0150
A-3	1.071	117.961	0.476	1.033	0.820	1.037	8.749	6.417	6.559	0.0150
A-3	1.288	117.984	0.499	1.076	0.858	1.197	10.519	7.479	7.627	0.0150
A-3	1.288	117.984	0.499	1.076	0.922	1.197	10.519	8.633	8.781	0.0150
A-3	1.598	118.011	0.526	1.104	0.919	1.447	13.048	9.835	9.990	0.0150
A-3	2.199	118.052	0.567	1.173	0.909	1.875	17.958	11.062	11.229	0.0150
A-3	2.240	118.056	0.571	1.166	0.939	1.922	18.299	12.224	12.392	0.0150
A-3	3.060	118.098	0.613	1.243	0.928	2.461	24.992	13.453	13.632	0.0150
A-3	5.221	118.180	0.695	1.443	0.931	3.617	42.640	14.753	14.957	0.0150
A-3	7.717	118.254	0.769	1.623	0.951	4.756	63.033	16.039	16.264	0.0150
A-3	10.465	118.321	0.836	1.784	0.971	5.865	85.471	17.057	17.303	0.0150
A-3	11.349	118.340	0.855	1.833	0.982	6.193	92.691	17.434	17.682	0.0150
A-3	14.462	118.403	0.918	1.970	1.012	7.340	118.119	18.992	19.246	0.0150
A-3	19.304	118.483	0.998	2.166	1.043	8.911	157.672	20.274	20.539	0.0150
A-3	20.495	118.501	1.016	2.205	1.094	9.295	167.400	22.433	22.700	0.0150
A-3	21.218	118.512	1.027	2.223	1.101	9.545	173.305	22.976	23.244	0.0150
A-3	21.991	118.523	1.038	2.244	1.108	9.800	179.612	23.425	23.694	0.0150
A-3	23.821	118.549	1.064	2.285	1.121	10.425	194.563	24.602	24.872	0.0150
A-3	25.748	118.575	1.090	2.323	1.139	11.084	210.301	26.122	26.393	0.0150
A-3	26.736	118.588	1.103	2.339	1.157	11.432	218.375	27.459	27.731	0.0150
A-3	28.117	118.605	1.120	2.362	1.160	11.905	229.650	28.166	28.439	0.0150
A-3	30.308	118.630	1.145	2.401	1.164	12.621	247.548	29.104	29.379	0.0150
A-3	33.457	118.664	1.179	2.454	1.173	13.636	273.264	30.600	30.876	0.0150
A-3	33.765	118.668	1.183	2.454	1.191	13.761	275.782	31.794	32.071	0.0150
A-3	37.946	118.709	1.224	2.514	1.193	15.096	309.930	33.360	33.639	0.0150
A-3	39.113	118.720	1.235	2.529	1.195	15.466	319.465	33.893	34.174	0.0150
A-3	41.182	118.739	1.254	2.555	1.199	16.119	336.363	34.821	35.103	0.0150
A-3	45.956	118.780	1.295	2.614	1.201	17.579	375.358	36.402	36.686	0.0150
A-3	48.197	118.799	1.314	2.636	1.209	18.284	393.657	37.753	38.039	0.0150
A-3	52.384	118.831	1.346	2.685	1.207	19.506	427.853	38.654	38.942	0.0150
A-3	56.712	118.864	1.379	2.727	1.204	20.800	463.209	39.784	40.074	0.0150
A-3	61.598	118.900	1.415	2.767	1.206	22.264	503.115	41.532	41.823	0.0150
A-3	61.741	118.901	1.416	2.768	1.206	22.306	504.283	41.569	41.861	0.0150
A-3	70.006	118.954	1.469	2.851	1.209	24.554	571.791	43.291	43.586	0.0150
A-3	78.713	119.005	1.520	2.938	1.209	26.794	642.902	44.541	44.841	0.0150
A-3	84.872	119.040	1.555	2.992	1.210	28.370	693.206	45.516	45.818	0.0150
A-3	92.956	119.085	1.600	3.052	1.214	30.459	759.236	47.319	47.623	0.0150
A-3	92.956	119.085	1.600	3.052	1.214	30.459	759.236	47.319	47.623	0.0150

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
A-3	108.358	119.159	1.674	3.184	1.222	34.028	885.037	49.140	49.451	0.0150
A-3	115.941	119.195	1.710	3.236	1.228	35.823	946.966	50.619	50.932	0.0150
A-3	120.007	119.213	1.728	3.266	1.230	36.739	980.179	51.145	51.460	0.0150
A-3	128.795	119.252	1.767	3.323	1.234	38.759	1051.954	52.446	52.764	0.0150
A-3	134.133	119.277	1.792	3.346	1.239	40.089	1095.557	53.928	54.247	0.0150
A-3	139.934	119.301	1.816	3.381	1.241	41.393	1142.939	54.729	55.049	0.0150
A-3	148.490	119.334	1.849	3.436	1.245	43.215	1212.823	55.671	55.994	0.0150
A-3	168.727	119.407	1.922	3.564	1.253	47.343	1378.110	57.431	57.760	0.0150
A-3	178.036	119.440	1.955	3.615	1.258	49.256	1454.145	58.516	58.848	0.0150
A-3	181.887	119.454	1.969	3.632	1.259	50.079	1485.593	59.052	59.385	0.0150
A-3	198.736	119.512	2.027	3.710	1.264	53.561	1623.214	61.003	61.340	0.0150
A-3	202.220	119.524	2.039	3.724	1.266	54.296	1651.671	61.506	61.843	0.0150
A-3	209.225	119.553	2.068	3.729	1.265	56.106	1708.886	63.337	63.675	0.0150
A-3	210.229	119.557	2.072	3.730	1.265	56.360	1717.089	63.582	63.920	0.0150
A-3	222.900	119.597	2.112	3.782	1.270	58.934	1820.579	65.138	65.479	0.0150
A-3	234.447	119.633	2.148	3.824	1.274	61.308	1914.891	66.749	67.091	0.0150
A-3	239.644	119.648	2.163	3.846	1.275	62.313	1957.340	67.232	67.576	0.0150
A-3	254.321	119.692	2.207	3.894	1.278	65.310	2077.219	69.000	69.345	0.0150
A-3	258.449	119.704	2.219	3.908	1.279	66.141	2110.932	69.474	69.820	0.0150
A-3	276.882	119.753	2.268	3.979	1.284	69.583	2261.487	71.029	71.379	0.0150
A-3	288.859	119.786	2.301	4.015	1.288	71.953	2359.309	72.606	72.958	0.0150
A-3	292.013	119.794	2.309	4.026	1.288	72.535	2385.074	72.874	73.226	0.0150
A-3	310.742	119.842	2.357	4.085	1.292	76.077	2538.041	74.691	75.045	0.0150
A-3	318.034	119.861	2.376	4.103	1.294	77.504	2597.605	75.595	75.950	0.0150
A-3	325.558	119.880	2.395	4.124	1.296	78.949	2659.060	76.468	76.824	0.0150
A-3	349.296	119.935	2.450	4.198	1.300	83.206	2852.938	78.333	78.693	0.0150
A-3	352.997	119.943	2.458	4.211	1.301	83.834	2883.166	78.558	78.917	0.0150
A-3	369.431	119.980	2.495	4.258	1.306	86.768	3017.401	80.070	80.433	0.0150
A-3	402.351	120.047	2.562	4.364	1.313	92.193	3286.277	81.874	82.242	0.0150
A-3	405.943	120.054	2.569	4.376	1.314	92.767	3315.616	82.035	82.403	0.0150
A-3	431.854	120.108	2.623	4.441	1.317	97.247	3527.249	83.905	84.277	0.0150
A-3	445.511	120.134	2.649	4.480	1.319	99.438	3638.798	84.599	84.973	0.0150
A-3	457.385	120.160	2.675	4.499	1.322	101.657	3735.777	86.102	86.477	0.0150
A-3	475.860	120.194	2.709	4.549	1.325	104.601	3886.673	87.069	87.446	0.0150
A-3	492.574	120.229	2.744	4.575	1.326	107.677	4023.192	88.747	89.126	0.0150
A-3	497.108	120.237	2.752	4.586	1.327	108.389	4060.223	88.976	89.355	0.0150
A-3	517.357	120.275	2.790	4.627	1.330	111.802	4225.609	90.646	91.027	0.0150
A-3	540.588	120.314	2.829	4.686	1.334	115.357	4415.353	91.699	92.083	0.0150
A-3	567.155	120.361	2.876	4.738	1.337	119.709	4632.343	93.484	93.871	0.0150
A-3	567.155	120.361	2.876	4.738	1.337	119.709	4632.343	93.484	93.871	0.0150
A-3	586.359	120.395	2.910	4.770	1.340	122.915	4789.199	95.111	95.500	0.0150
A-3	606.761	120.430	2.945	4.805	1.343	126.273	4955.838	96.751	97.142	0.0150
A-3	615.982	120.444	2.959	4.826	1.344	127.630	5031.146	97.122	97.513	0.0150
A-3	665.410	120.518	3.033	4.933	1.351	134.894	5434.858	99.204	99.601	0.0150
A-3	667.919	120.522	3.037	4.937	1.351	135.291	5455.352	99.364	99.761	0.0150
A-3	690.801	120.560	3.075	4.966	1.353	139.102	5642.246	101.251	101.650	0.0150
A-3	700.254	120.574	3.089	4.983	1.354	140.523	5719.454	101.769	102.169	0.0150

Annex C – West Northamptonshire Council LLFA Response

West Northamptonshire Council
Lead Local Flood Authority

Developer Data and Information Request

LLFA Reference	DR.2024.7
Location	Green Hill Solar – (a) NN69PZ, (b) NN69SN, (c) NN6 0BW, (d) NN6 0DL, (e) NN60TW
Proposal	Request for instances of historic flooding at or near this location, details of flood defences in the area, information regarding maintenance of land drains and management of flood risk in the area, any restrictions in developing near a IDB owned watercourse and specific requirements for discharge rates to land drains
Request By	lantell@mabbett.eu
Request Date	02/01/2024
Response Date	03/06/2024

Dear Lucy,

Thank you for requesting flood risk data for the above site. Please find below and attached our response to your request. The postcodes NN6 0BW, NN6 0DL and NN60TW are not located in West Northamptonshire Council, so we are unable to provide the requested information.

Historic Flood Records

Since the creation of the Lead Local Flood Authority (LLFA) role in 2010, West Northamptonshire Council (WNC) has undertaken to collect as much information as possible relating to historic flood incidents within the district. We have recorded, if known, where actions have been undertaken or are proposed to alleviate the flood risk. The data we have collected is not considered to be exhaustive, and data relating to flood incidents occurring prior to 2010 is limited. For the above postcodes (a) and (b) we have collected the following information:

(a) NN6 9PZ

- Within the site boundary:
  - No historic flooding reports located within the site boundary.
- Within 500m of the site boundary:

Date	Location to street level	Description
14/06/2007	Gold Street, Walgrave	Flooding due to weather conditions
Unknown	Lower Green, Walgrave	Internal flooding to property. Silted culvert.

(b) NN6 9SN

- Within the site boundary:

Date	Location to street level	Description
14/12/2012	Sywell Road, Holcot	Carriageway flooding, out of hours team to clear and make safe. Conways instructure to attend to clear as required.
21/11/2012	Holcot Lane, Sywell	Flooding

- Within 500m of the site boundary:

Date	Location to street level	Description
21/11/2012	Sywell Road, Holcot	Car stuck in flood water.
22/11/2012	Sywell Road, Holcot	Carriageway flooded – approx. 3ft deep
14/12/2012	Sywell Road, Holcot	Carriageway flooded

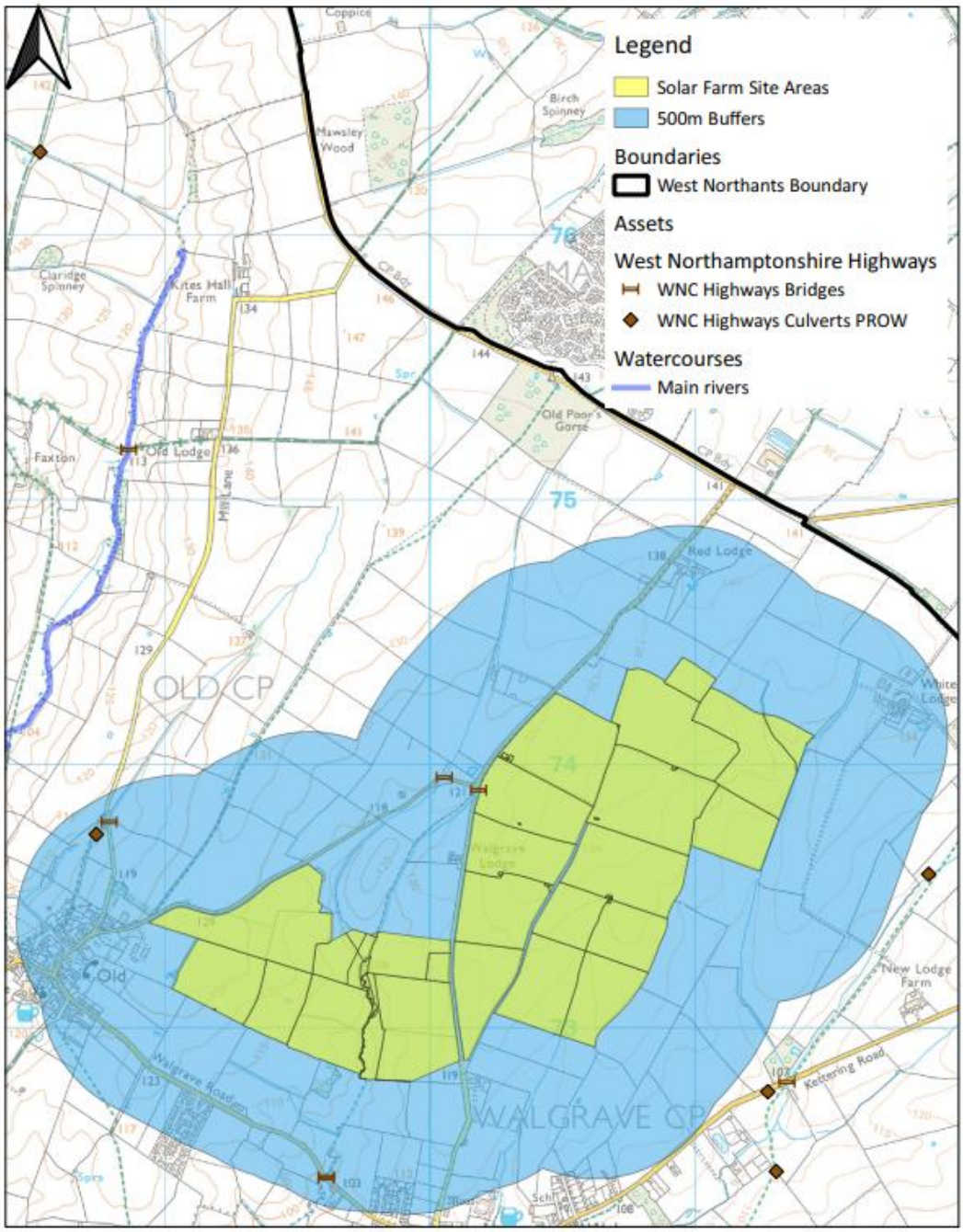
Section 19 Flood Investigations

Under the Flood and Water Management Act 2010 LLFAs have to carry out investigations into flooding incidents if they meet set thresholds. Investigations take place after the flood event has passed and the flood water has receded. We recommend that you have a look at past flood investigations report which are available in our webpage www.westnorthants.gov.uk/am-i-risk/flood-investigation-reports

Asset Register

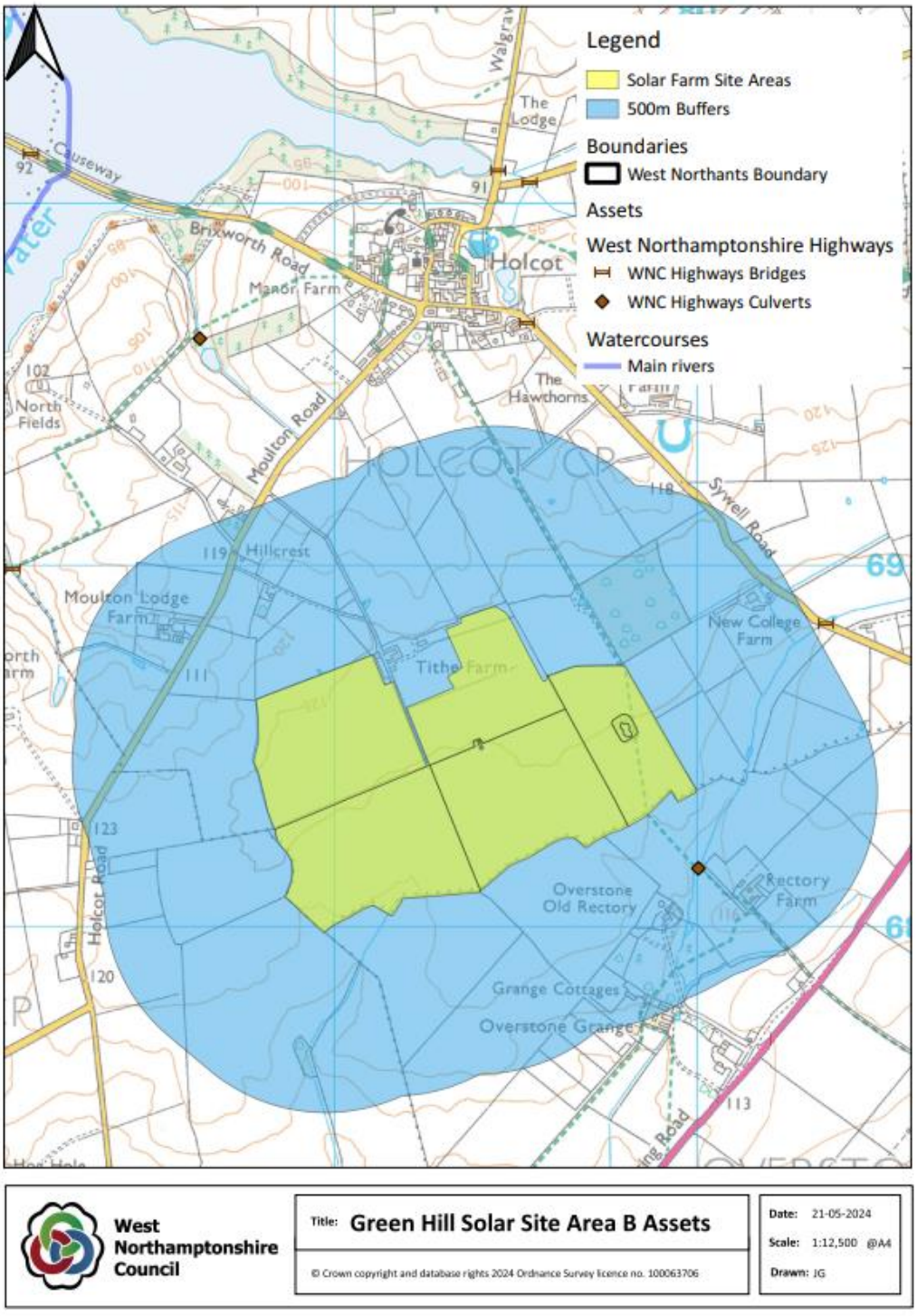
Under the Flood and Water Management Act 2010 we have a duty to maintain a register of assets which have a significant impact on flood risk. We have undertaken a search of our Asset Register, which contains information on all assets relating to flood risk within the county which we have been made aware of. A summary of any assets shown to lie within the site boundary and within a 500m buffer of the site is provided below. Exact details of third party assets should be requested from the relevant risk management authority.

NN6 9PZ



Our records show that Anglian Water hold assets within the 500m buffer of this site. For details on these assets please contact Anglian Water directly.

NN6 9SN



Our records show that Anglian Water hold assets within the 500m buffer of this site. For details on these assets please contact Anglian Water directly.

Risk of Flooding from Surface Water

By searching a location by postcode, information regarding the risk of surface watter flooding can be found at www.gov.uk/check-long-term-flood-risk

The sequential approach should be taken in considering the site layout in relation to the risk of flooding from surface water runoff. No properties or sensitive development should be located in areas shown to be at risk of flooding.

Risk of Flooding from Groundwater

We have recently completed a detailed study into groundwater flood risk in Northamptonshire. This is available online at www.westnorthants.gov.uk/flooding-and-flood-risk-management/statutory-and-project-documents.

For NN6 9PZ, this map indicates that the majority of site is likely to be negligible risk, there are small vertical bands of very low risk in the west of the location and a small location of very high risk in the north. For NN6 9SN, this map indicates that the majority of site is likely to be negligible risk, the majority of the north east of the site is very low risk and has small locations of moderate and high risk throughout.

Advice on how to consider groundwater flood risk in a Flood Risk Assessment is provided at [redacted]

Northamptonshire Local Flood Risk Management Strategy

The Northamptonshire Local Flood Risk Management Strategy was approved in November 2017, and the associated Action Plan was last updated in November 2020. This can be found at www.westnorthants.gov.uk/flooding-and-flood-risk-management/local-flood-risk-management-strategy This document and its related policies and recommendations apply to all development and flood risk management work within the County of Northamptonshire.

The Strategy is currently being updated and initial public consultation is currently taking place, further details will be available on our website.

Upper Nene Catchment

Following the significant flooding to Northampton town centre in Easter 1998 improvements were made to the flood defences along the River Nene. In order to secure the level of protection afforded by the new defence, the Environment Agency agreed with the West Northants Joint Planning Unit that the standards set for new development should also be improved, beyond industry standards.

Therefore all new development in the Upper Nene catchment must be designed for a flood with a 0.5% probability (1 in 200 chance) of occurring in any year, including an appropriate allowance for climate change. This includes design of mitigation for river flooding and any surface water attenuation. This applies across the whole of the Upper Nene catchment including all branches and arms of the Nene, upstream of Billing Aquadrome, and all tributaries such as Wootton Brook, Dallington Brook and Bugbrooke Brook.

This standard relates to the total drainage design, not individual elements such as gullies and swales. The drainage system should be designed to ensure that there is no increased risk of

flooding from the site in the 0.5% event, and that in this event any flooding on the site is limited to designated flood-safe areas such as open space and does not affect any properties, critical infrastructure or access/egress routes within the site.

This policy is outlined within the West Northamptonshire Joint Core Strategy Local Plan (Policy BN7 – Flood Risk, page 129).

Ordinary Watercourse Consent

Ordinary watercourses are riparian owned, i.e. the ownership and maintenance responsibilities are shared by the landowners on either side of the watercourse. It should be noted that any development within 9m of any ordinary watercourse requires the prior consent of the relevant flood risk management authority as outlined in Policy 7 of the Northamptonshire Local Flood Risk Management Strategy.

The Land Drainage consenting service was formally carried out by the Internal Drainage Boards (IDB) and has recently moved back into the Council. For enquries please email: **floodandwater.ncc@westnorthants.gov.uk**. We are currently in the process of building this system which is causing a delay in providing land drainage consents. We apologise for inconveniences this may cause, please be assured we are setting up the system with a matter of urgency. We expect the service to be fully in place in June 2024.

Any works on the site within 9m of the bank of a main river will need prior consent from the Environment Agency through the new Environmental Permitting regime – see www.gov.uk/topic/environmental-management/environmental-permits.

If the watercourse owned by the IDB is within 9m of the site/within the site, a 9m buffer should be maintained between the edge of the watercourse for maintenance access unless demonstrated inappropriate. All buildings and structures should be located outside of the area of flood risk. The developer will need to consult the IDB for consent for all works within 9m of an ordinary watercourse. This consent is separate to the land drainage consent. Further information can be found at [redacted]

SuDS Guidance

Defra has published non statutory technical standards for the design, maintenance and operation of sustainable drainage systems www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards.

We have published local guidance to assist developers in the design of all surface water drainage systems, and to support Local Planning Authorities in considering drainage proposals for new development in Northamptonshire. The guidance sets out the standards that we apply in assessing all surface water drainage proposals and can be found at www.westnorthants.gov.uk/flooding-and-flood-risk-management/statutory-and-project-documents

Local Standards and Guidance for Surface Water Drainage is currently being updated and will be shared on our website once available.

Known Site-Specific Issues and Drainage Constraints

The BGS Infiltration SuDS Map found at [redacted]

provides screening-level data that gives an indication of the suitability of the subsurface for infiltration SuDS features. This dataset indicates that the site may be suitable for the use of infiltration drainage.

Adoption and Maintenance of SuDS

West Northamptonshire Council as Lead Local Flood Authority does not currently adopt SuDS. In due course, the implementation of schedule 3 of the Flood and Water Management Act 2010 may introduce changes regarding the approval and adoption of SuDS if they meet a set of requirements.

If SuDS are designed purely to drain an adoptable highway then Northamptonshire Highways may adopt the SuDS feature. However each case is determined on its own merits and should be discussed with Northamptonshire Highways before any adoption assumptions are made. Please contact Northamptonshire Highways at:

- Section 38 Highway Adoption Queries – highwayadoptions.ncc@westnorthants.gov.uk
- Section 278 Queries – section278.ncc@westnorthants.gov.uk
- General queries pre-planning approval - highwaysdmconsultations@westnorthants.gov.uk

Anglian Water also has a SuDS Adoption Manual, which can be found here:

[redacted]

Developers can apply for Anglian Water to consider the adoption of your proposed SuDS scheme by submitting an expression of interest at:

[redacted]

The responsibility remains with the developer to ensure that adequate long-term maintenance of any drainage system can be delivered. Evidence should be submitted as part of any major planning application to demonstrate that agreements are in place for the entirety of the drainage system to be adopted and maintained in perpetuity.

There are four main options available to developers for the adoption and maintenance of SuDS:

1. The local sewerage undertaker/water company may adopt and maintain certain features;
2. Adoption could be agreed through a Section 106 agreement/ separate agreement with the borough, district, town or parish council and pay the Commuted Sums for the maintenance;
3. Set up or use a service management company; or
4. Adoption and maintenance by private individuals (only where the SuDS serve individual properties).

The adoption and maintenance of all drainage within a development would have to be discussed and agreed directly with the relevant Local Planning Authority.

Maintenance of land drainage

As the LLFA we do not hold information on the maintenance of surface water drainage assets. If you require information on assets held by National Highways, you can contact them here: info@nationalhighways.co.uk. If you require information on assets held by the riparian owner of the watercourse you will need to contact them directly.

Specific requirements for discharge rates for land drainage

It is not clear if the data request is using “land drains” to refer to a means of surface water management though perforated piping collecting drainage from below ground, or if the request is referring to “land drains” as overall land drainage/surface water manamangent. Should a connection to an existing drainage feature be proposed, we would recommend that you undertake suitable investigations to confirm its downstream capacity and condition.
Below outlines the discharge rate expectations for surface water management.

- For a Full planning application we would expect to see full WinDES modelling or similar with the details on proposed discharge rates, simulating storms through the whole drainage system, with results of critical storms, demonstrating that there is no surcharge in the system for the 1 in 1 year, no above ground flooding for the 1 in 30 year, and that any above-ground flooding for 1 in 100 year storm is limited to areas designated and safe to flood, away from sensitive infrastructure or buildings. These storms should also include an allowance for climate change. We may have further comments to make on receipt of this information.
- For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event.
- For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event. If this is not possible then the rates should be reduced by at least 40% post-development to account for the impacts of climate change.
- Allowable discharge rates should be based only on the proposed impermeable area excluding public open space. Greenfield runoff rates may be estimated using the tool available at: www.uksuds.com/tools/greenfield-runoff-rate-estimation which requires the total site area, positively drained area and open space.

Should you require any further information, or wish to discuss these matters further, please do not hesitate to contact us.

Yours faithfully,

[redacted] *MRTPI FCIWEM C.WEM*

For and on behalf of Colin Barrett, Head of Works, West Northamptonshire Council – Lead Local Flood Authority

Disclaimer:
This response is made by the Unitary Council in its capacity as a Lead Local Flood Authority as a statutory consultee. As a Lead Local Flood Authority (LLFA) we respond to Planning Applications considering where development has the greatest ability to affect flood risk. For the avoidance of doubt, we do not comment on

water quality, contaminated land/landfill, wastewater, risk of flooding from ground water, biodiversity and ecological impacts, fisheries, water framework directive, amenity, health & safety, or navigation.
These comments should be taken as general comments on surface water drainage only. A detailed review of any technical assessments, methodology and results has not been undertaken by the LLFA. Liability for such technical work therefore rests with organisation(s) who have undertaken this technical work and the Local Planning Authority responsible for the planning decision.

[i] Google Maps
[ii] England | Catchment Data Explorer
[iii] GeoIndex (onshore) - British Geological Survey
[iv] MAGIC
[v] Get flood risk information for planning in England - Flood map for planning - GOV.UK
[vi] Where do you want to check? - Check your long term flood risk - GOV.UK