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Flood Risk Assessment

Proposed Development at

Bowley Farm, Bowley Lane, Chichester

On behalf of

Mr Tim Clarke

June 2021

Document History and Status

Project Number 23548

Date	Version	Prepared By	Reviewed By	Approved By
11 J une 2021	1.0	Martin Kempshall C Eng MICE	Stuart Magowan IE ng MICE	Stuart Magowan IE ng MICE
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1 Non Technical Summary

- 1.1 This Flood Risk Assessment has been undertaken in accordance with the National Planning Policy Framework on behalf of Mr Tim Clarke in support of a Planning Application for the siting of 4 caravans on the existing caravan site at Bowley Farm, Bowley Lane, Chichester.
- 1.2 This Assessment is to be read in conjunction with all planning, architectural and other reports that accompany the Planning Application for the proposed development.
- 1.3 The main site and the proposed siting of caravans are located in Flood Zone 1. The main site access is located in Flood Zones 2 and 3.
- 1.4 Foul drainage will be discharged to the existing onsite foul drainage facilities.
- 1.5 This report concludes that both the site and access road are not at risk of flooding from tidal or fluvial sources, overland flows, reservoirs or groundwater throughout the lifetime of the development.
- 1.6 In terms of flood risk the proposed development is suitable at this location.

2 Planning Policy Context

2.1 National Planning Policy Framework

2.1.1 The National Planning Policy Framework was updated in February 2019.

2.1.2 With regard to planning and flood risk the policy framework states that :when determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment.

Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- b) the development is appropriately flood resistant and resilient;
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- d) any residual risk can be safely managed; and
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.~

2.1.3 With regard to minor developments the NPPF states that :applications for some minor development and changes of use (reference footnote 51) should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 50.~

2.1.4 Footnote 50 reads :a site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.~

2.1.5 Footnote 51 reads :this includes householder development, small non-residential extensions (with a footprint of less than 250m²) and changes of use; except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site, where the sequential and exception tests should be applied as appropriate.~

2.1.6 With regard to major developments the NPPF states that :major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

- a) take account of advice from the lead local flood authority;
- b) have appropriate proposed minimum operational standards;
- c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
- d) where possible, provide multifunctional benefits ~

2.2 Planning Policy Guidance Flood Risk and Coastal Change

2.2.1 Paragraph 30 Planning Policy Guidance Flood Risk and Coastal Change states that :The objectives of a site-specific flood risk assessment are to establish:

- ¿ whether a proposed development is likely to be affected by current or future flooding from any source;
- ¿ whether it will increase flood risk elsewhere;
- ¿ whether the measures proposed to deal with these effects and risks are appropriate;
- ¿ the evidence for the local planning authority to apply (if necessary) the Sequential Test, and;
- ¿ whether the development will be safe and pass the Exception Test, if applicable ~

2.2.2 Paragraph 31 states that :The information provided in the flood risk assessment should be credible and fit for purpose. Site-specific flood risk assessments should always be proportionate to the degree of flood risk and make optimum use of information already available, including information in a Strategic Flood Risk Assessment for the area, and the interactive flood risk maps available on the Environment Agency's web site.

A flood risk assessment should also be appropriate to the scale, nature and location of the development. For example, where the development is an extension to an existing house (for which planning permission is required) which would not significantly increase the number of people present in an area at risk of flooding, the local planning authority would generally need a less detailed assessment to be able to reach an informed decision on the planning application. For a new development comprising a greater number of houses in a similar location, or one where the flood risk is greater, the local planning authority would need a more detailed assessment. ~

2.3 Lead Local Flood Authority

2.3.1 West Sussex County Council became a Lead Local Flood Authority under the Flood and Water Management Act 2010 and was given a series of new responsibilities to coordinate the management of local flood risk.

2.3.2 As part of its role West Sussex County Council has commissioned and produced the following documents:

- ¿ Strategic Flood Risk Assessment - J anuary 2010
- ¿ Preliminary Flood Risk Assessment - May 2011
- ¿ Local Flood Risk Management Strategy - May 2014

2.3.3 In addition to the above documents the West Sussex Policy for the Management of Surface Water was updated in November 2018.

2.3.4 The above documents have been reviewed in the preparation of this report.

2.4 Arun District Council

2.4.1 Arun District Council has commissioned and produced the following documents:

- ¿ Strategic Flood Risk Assessment - February 2008
- ¿ Arun Strategic Surface Water Management Study - October 2016
- ¿ Combined Level 1 and Level 2 Strategic Flood Risk Assessment - November 2016

2.4.2 The above documents have been reviewed in the preparation of this report.

2.5 Local Planning Policy

2.5.1 The Arun Local Plan 2011 - 2031 was adopted in J uly 2018.

2.5.2 Policy W SP1 - Water states that :Arun District Council will encourage water efficiency measures in order to protect the District's water resources and enhance the quality of the water environment which supports a range of habitats and ecosystems. Development will be encouraged to make active use of surface water as a design feature and permitted where it identifies measures to improve and enhance waterbodies, coastal habitats or provides additional flood relief.

The Council will also support development that:

- ¿ is appropriately located, taking account of flood risk and promotes the incorporation of appropriate mitigation measures into new development, particularly Sustainable Drainage Systems that reduces the creation and flow of surface water and improves water quality;

- ¿ reduces the risk to homes and places of work from flooding whilst increasing biodiversity;
- ¿ delivers a range of community benefits including enhancing the quality of life and providing greater resistance to the impact of climate change.”

2.5.3 Policy W DM2 – Flood Risk states that development in areas at risk from flooding, identified on the latest Environment Agency flood risk maps and the Council's Strategic Flood Risk Assessment (SFRA) will only be permitted where all of the following criteria have been satisfied:

- ¿ The sequential test in accordance with the National Planning Policy Guidance has been met.
- ¿ A site specific Flood Risk Assessment demonstrates that the development will be safe, including access and egress, without increasing flood risk elsewhere and reduce flood risk overall.
- ¿ The sustainability benefits to the wider community are clearly identified.
- ¿ The scheme identifies adaptation and mitigation measures.
- ¿ Appropriate flood warning and evacuation plans are in place; and

New site drainage systems are designed to take account of events which exceed the normal design standard i.e. consideration of flood flow routing and utilising temporary storage areas.

The reports prepared as part of the criteria above must take into account contingency allowances, taking climate change into account as set out in Flood Risk Assessments: climate change allowances section of the NPPG.

In locations where strategic flood defence or resilient and resistant construction measures are necessary within the site itself, proposals will be required to demonstrate how measures have been incorporated as an intrinsic part of the scheme in a manner which is compatible with the latest Strategic Flood Risk Assessment.

All development proposals must take account of relevant Surface Water Management Plans, Catchment Flood Management Plans and related Flood Defence Plans and strategies such as the Lower Tidal River Arun Strategy. The council may require financial contributions from development on sites where measures to address flood risk or to improve the environmental quality of watercourses have been identified by these Plans and Strategies.”

2.5.4 Policy ECC SP1 - Adapting to climate change states that the Council will support development which is located and appropriately designed to adapt to impacts arising from climate change such as the increased probability of tidal and fluvial flooding; water stress; health impacts as a result of extreme temperatures and a decline in the quality of habitats and richness of biodiversity.

In order to achieve this, development must be designed to take account of the following issues:

- ¿ Location (in relation to flood risk and vulnerability to coastal erosion);
- ¿ Water efficiency;
- ¿ Shade, cooling, ventilation, solar gain;
- ¿ Connectivity to the green infrastructure network;
- ¿ Layout and massing;
- ¿ Resilience of buildings and building materials to extreme weather events; and
- ¿ Capacity of drainage systems and incorporation of Sustainable urban Drainage Systems (SuDS)~

2.6 Environment Agency

2.6.1 Shoreline Management Plans are developed by the Environment Agency and Coastal Groups together with members from County and District councils to identify the most sustainable approach to managing flood and coastal erosion risks to coastlines over the short (0 to 20 years), medium (20 to 50 years) and long term (50 to 100 years).

2.6.2 The Beachy Head to Selsey Bill Shoreline Management Plan (SMP 12) was produced in December 2010, which has been reviewed in the preparation of this report.

3 Existing Site

3.1 Site Location

3.1.1 The development site is located to the South of Bowley Farm, Bowley Lane, Chichester, Ordnance Survey reference SZ 885 997. The nearest postcode is PO20 1NB.



Image 1: Site Location

3.1.2 The site is located in a rural setting and is bounded to the north by a small solar farm, to the east by the main caravan park, with trees to the south and east together with open fields beyond.

3.1.3 A copy of the site location plan is located in Appendix 1 at the rear of this report.

3.2 Site Description

3.2.1 The site is approximately 2,250m² in area and currently comprises unused land which comprises part of the existing caravan park.

3.2.2 The topographic survey is based upon an arbitrary site datum which identifies that existing ground levels are highest at the southern boundary of the site and fall gradually towards its northern boundary.

3.2.3 A copy of the existing site layout plan is located in Appendix 2 at the rear of this report.

3.3 Existing Drainage

- 3.3.1 Surface water from the existing properties currently discharges in an unrestricted manner in part to ground and in part overland to the drainage ditch located to the north of the solar farm.

4 Flood Zone, Flood Defences and Flood History

4.1 Tidal Flood Zone

4.1.1 The Environment Agency's online mapping confirms that the site is located in Flood Zone 1 with the site access road located in Flood Zones 2 and 3. The main development site is not at risk of tidal flooding from anything less extreme than a 1:200 year flood event.

4.1.2 The tidal flood level data supplied by the Environment Agency is based on the data model from 2016. The predicted climate change models were updated in December 2019.

4.1.3 Reference has been made to the Environment Agency's latest predicted sea level rise data at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> in order to establish the present day and future year tidal flood levels using the updated climate change predictions.

4.1.4 These are presented by the Environment Agency as a higher central allowance (70th percentile exceeded by 30% of the projections in the range) and an upper end allowance (95th percentile exceeded by 5% of the projections in the range).

4.1.5 The undefended 1:200 year tidal flood level supplied by the Environment Agency based on the data model from 2016 is 3.29m AOD.

4.1.6 The predicted undefended levels based on the updated climate change predictions are as follows:

¿ 2016 1:200 year flood level	3.290m AOD
¿ 2021 1:200 year flood level	3.319m to 3.325m AOD
¿ 2070 1:200 year flood level	3.717m to 3.839m AOD
¿ 2125 1:200 year flood level	4.400m to 4.780m AOD

4.2 Fluvial Flood Zone

4.2.1 The Environment Agency's online mapping confirms that the site is located in Fluvial Flood Zone 1 and is not at risk of fluvial flooding from anything less extreme than a 1:1,000 year flood event.

4.3 Flood Defences

4.3.1 There are no formal flood defences within close proximity to the site, however the banks of the Pagham Rife in the form of an embankment provide an increased standard of protection to the site.

4.3.2 The site benefits from the existing 'Hold the Line' Shoreline Management Plan policy between Aldwick and Pagham with new coastal and flood defences

practices implemented between 2025-2055, which will be continued until at least 2105 as long term protection of the coastline.

4.4 Flood History

4.4.1 Environment Agency

4.4.1.1 The Environment Agency maps of historic flood incidents do not identify any historic incidents of flooding in the locality of the site.

4.4.2 West Sussex County Council

4.4.2.1 Neither the Strategic Flood Risk Assessment dated January 2010, the Preliminary Flood Risk Assessment dated May 2011, nor the Local Flood Risk Management Strategy dated May 2014 identify any specific flood incidents in the immediate vicinity of the site.

4.4.3 Arun District Council

4.4.3.1 The Strategic Flood Risk Assessment dated November 2016 does not identify any specific flood incidents in the immediate vicinity of the site.

5 Flooding Potential

5.1 Tidal Flooding

5.1.1 The main development siting the 4 caravans is located 2.8km from the coast and is not at risk of tidal flooding from anything less extreme than a present day 1:200 year flood event.

5.1.2 As previously noted the present day 2021 and future year 2125 predicted undefended tidal flood levels are as follows:

¿ 1:200 Year present day 2021 Flood level	3.319m to 3.325m AOD
¿ 1:200 future Year 2125 Flood level	4.400m to 4.780m AOD

5.1.3 The main development siting the 4 caravans is not at risk of tidal flooding from either the defended or undefended 1:200 year tidal flood event up to the year 2125.

5.1.4 The site access road is at flood risk from both the present day undefended 1:200 year tidal flood event and predicated future 1:200 year tidal flood event.

5.1.5 The site access road is not at flood risk from the defended 1:200 year tidal flood event and is only predicated to become at risk from this event beyond the year 2070.

5.2 Fluvial Flooding

5.2.1 The area of the proposed site is within Flood Zone 1 and is not at risk of fluvial flooding from anything less extreme than a 1:1,000 year flood event.

5.3 Groundwater Flooding

5.3.1 There are no records identified within West Sussex County Council's Strategic Flood Risk Assessment, Preliminary Flood Risk Assessment or Local Flood Risk Management Strategy nor in Arun District Council's Strategic Flood Risk Assessments (2006 and 2016 update) or Strategic Surface Water Management Study of groundwater flooding affecting the site.

5.4 Overland Flow

5.4.1 The Environment Agency maps identify parts of the site to be at very low risk of flooding from overland surface water. The access track is shown to be at low risk with localised areas of flooding identified with overland flow routes following the ordinary watercourse to the north of the site.

5.4.2 The flood mapping contained within the various flood documents produced by West Sussex County Council and Arun District Council do not identify any associated history of flooding and the risk is identified as low.

5.5 Flood Routing

5.5.1 The natural route for flood waters to dissipate, should any event occur on the site, is towards ordinary watercourse at the northern boundary.

5.5.2 There is no associated flood risk to the downstream catchment area.

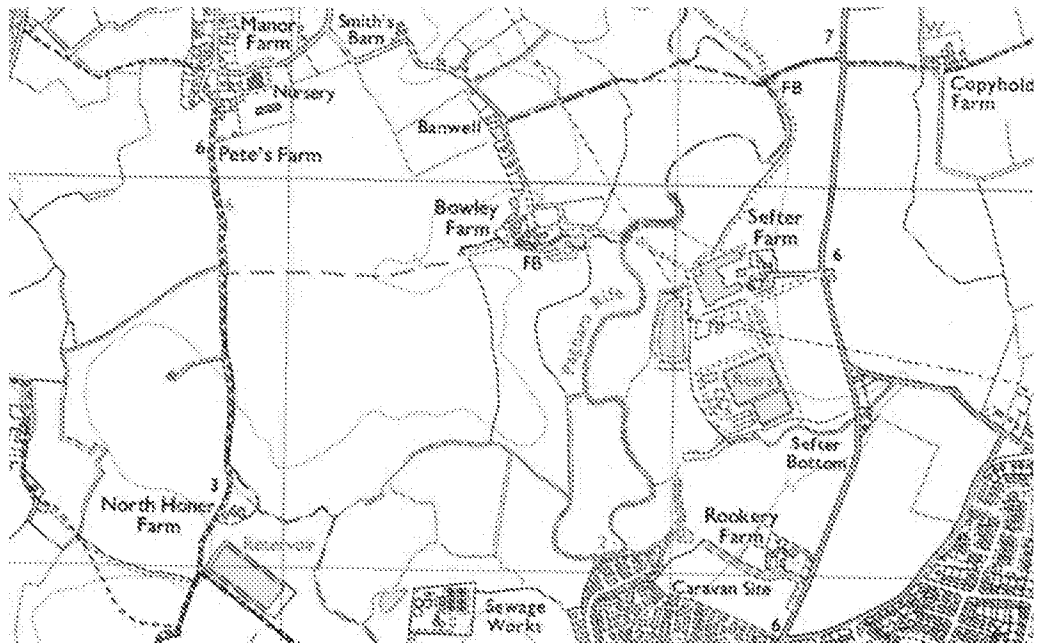


Image 2: Local Topography

6 Development Proposals

6.1 Description

6.1.1 The development proposals are for the siting of 4 caravans on the existing caravan site at Bowley Farm, Bowley Lane, Chichester.

6.1.2 A copy of the Proposed Site Layout Plan is located in Appendix 4 at the rear of this report.

6.2 Surface Water Drainage

6.2.1 Surface water from the caravans will drain to the surrounding area, either infiltrating to ground or following existing overland flow paths to the ordinary watercourse located to the north of the site mimicking the existing situation.

6.3 Foul Water Drainage

6.3.1 Foul drainage for the proposed caravans will discharge to the existing onsite drainage system.

7 Flood Zone Compatibility and Safe Development

7.1 Flood Zone Compatibility

7.1.1 The main site is in Flood Zone 1 with the access road located in Flood Zones 2 and 3. The site layout will be considered against current National Planning Policy Framework requirements and best practices.

7.1.2 With reference to the Technical Guidance to the National Planning Policy Framework:

¿ Table 2: Flood Risk Vulnerability Classification

The development proposed is classified as Highly Vulnerable.

¿ Table 3: Flood Risk Vulnerability and Flood Zone Compatibility

Highly Vulnerable development is appropriate in Flood Zones 1.

7.2 Safe Development

7.2.1 Latest Environment Agency guidance on climate change has been assessed to select the most appropriate climate change allowance for the vulnerability of the access road to the development to ensure that safe access and egress can be maintained to the site throughout its lifetime.

7.2.2 The design life of the proposed development is a maximum of 40 years and therefore the climate change allowances up to the year 2070 are deemed the most appropriate for assessing the suitability of the current access road.

7.2.3 The Beach Head to Selsey Bill Shoreline Management Plan (SMP 12) identifies the area as being located in an area with a 'Hold the Line' policy until at least the year 2105 confirming the existing tidal protection will remain beyond the lifetime of the development.

7.2.4 In light of the policy decision to maintain the existing defences until at least the year 2105 the whole site and access road is not at risk from the 1:200 year defended tidal flood event for the year 2070 confirming the whole site and access road will remain safe throughout its lifetime.

7.3 Residual Risk

7.3.1 Safety during tidal flood events.

7.3.1.1 In the highly unlikely event that defences are compromised by a tidal flood event during the development's lifetime the whole site will become a 'Safe Haven' until flood waters recede. The site management company would be encouraged to sign up to the Environment Agency's flood warning service

to make residents aware of the 'Safe Haven' policy to ensure residents remain on site until flood waters recede.

- 7.3.1.2 As the source of flooding is tidal the time period that the site would be affected by flood water inundation is foreseeable. As the threat is from tidal flooding the tidal event will subside within two hours of the peak event meaning the site would only ever be inaccessible for a very short period of time and therefore very low risk.

7.4 Risk to Others

- 7.4.1.1 No changes in land levels are proposed and no flood storage capacity will be removed from the site.
- 7.4.1.2 Due to the small impermeable surface areas of the caravans any surface water runoff from the roofs of the caravans from the site will either discharge to ground or via the existing overland flow paths mimicking existing conditions with negligible change in peak runoff.

8 Conclusions

- 8.1 The site is located within Flood Zone 1 and is not at risk from any source of flooding.
- 8.2 The site access road is located in Flood Zones 2 and 3 but will remain safe and accessible throughout the development's lifetime due to the current strategic tidal protection provided.
- 8.3 There are no historic records of flooding from any source affecting the site or its immediate area.
- 8.4 Foul drainage will be discharged to the existing onsite foul drainage facilities.
- 8.5 The site is not at risk of flooding from tidal or fluvial sources, overland flows, reservoirs or groundwater throughout the lifetime of the development.
- 8.6 The proposed development is safe and will not increase flood risk elsewhere.
- 8.7 In terms of flood risk the proposed development is suitable at this location.

9 List of Appendices, Images and Tables

Appendix 1	Site Location Plan
Appendix 2	Existing Site Layout Plan
Appendix 3	Flood Maps
Appendix 4	Proposed Site Layout Plans

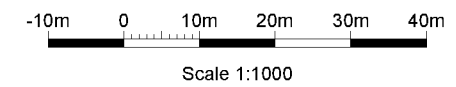
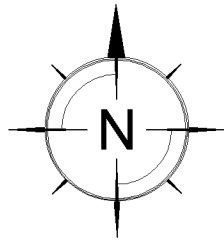
Image 1	Site Location
Image 2	Local Topography

Appendix 1

Site Location Plan

Appendix 2

Existing Site Layout Plan

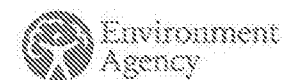


TITLE Existing Site Layout Plan	
SCALE 1:1000 @ A3	PROJECT No. 23548
REPORT TYPE FRA	DWG. No. 02

Appendix 3

Flood Maps

Flood Map for Planning (Rivers and Sea). Centred on PO20 1NB. Generated 08/06/2021.



1:10,000

0 Metres 250



Flood Map for Planning (Rivers & Sea)

- Defences
- ▨ Flood Storage Areas
- ▤ Areas benefiting from flood defences
- Flood Zone 3
- Flood Zone 2

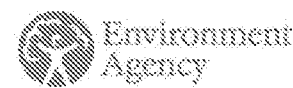
Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

FROM DISTRICT COUNCIL P39521/PL

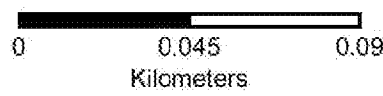


Legend

- Site Nodes
- Site Boundary

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:2,000



Product 4 Flood Risk Data Requested by: Martin Kempshall
Site: Bowley Farm, Chichester, PO20 1NB
Table 1: Water Levels: Tidal Undefended

Node Ref	NGR		Modelled Flood Levels in Metres AOD			
	Eastings	Northings	Undefended Annual Exceedance Probability			
			0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	488562	99840	3.29	3.81	4.52	3.49
2	488554	99790	-	-	4.52	-
3	488542	99738	-	-	-	-
4	488555	99667	-	-	-	-
5	488581	99632	-	-	4.55	-

Table 2: Water Levels: Tidal Defended

Node Ref	NGR		Modelled Flood Levels in Metres AOD			
	Eastings	Northings	Defended Annual Exceedance Probability			
			0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	488562	99840	-	-	3.56	-
2	488554	99790	-	-	-	-
3	488542	99738	-	-	-	-
4	488555	99667	-	-	-	-
5	488581	99632	-	-	-	-

Table 3: Water Depths: Tidal Undefended

Node Ref	NGR		Modelled Flood Depths in Metres			
	Eastings	Northings	Undefended Annual Exceedance Probability			
			0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	488562	99840	0.31	0.84	1.54	0.51
2	488554	99790	-	-	0.20	-
3	488542	99738	-	-	-	-
4	488555	99667	-	-	-	-
5	488581	99632	-	-	0.39	-

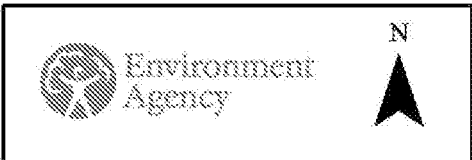
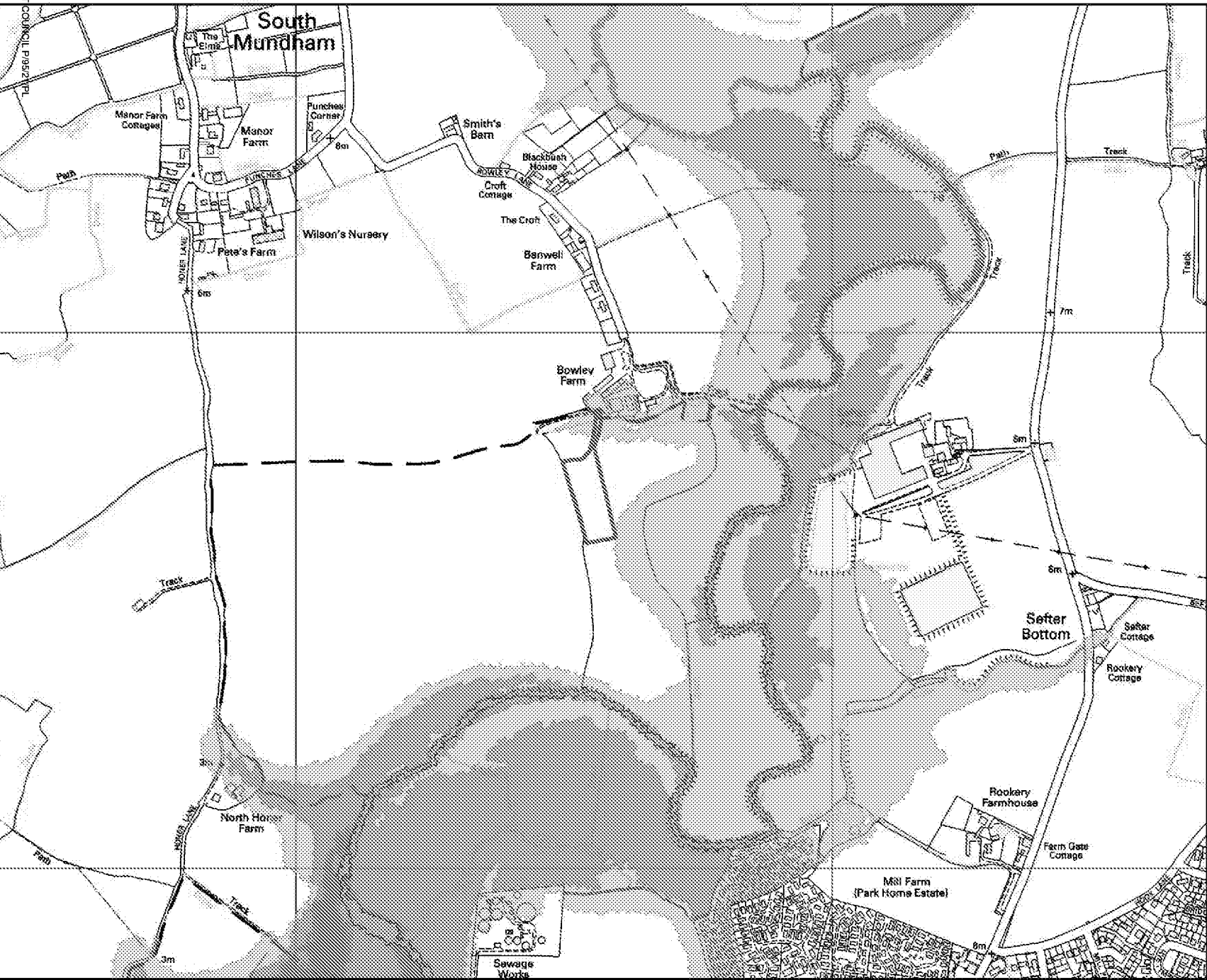
Table 4: Water Depths: Tidal Defended

Node Ref	NGR		Modelled Flood Depths in Metres			
	Eastings	Northings	Defended Annual Exceedance Probability			
			0.5%	0.5% (2070)	0.5% (2115)	0.1%
1	488562	99840	-	-	0.59	-
2	488554	99790	-	-	-	-
3	488542	99738	-	-	-	-
4	488555	99667	-	-	-	-
5	488581	99632	-	-	-	-

All levels taken from: River Arun to East Head Coastal Modelling (2016)

Produced on: 08/06/2021

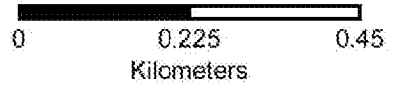
There is no additional information or health warnings for these levels/depths or the model from which they have been produced.

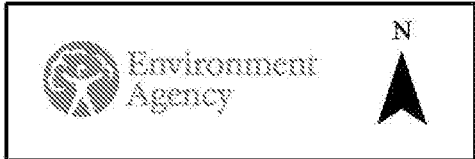


- Legend**
- Site Boundary
 - 0.5% AEP (Defended Tidal)
 - 0.5% AEP (2070) NPPF (Defended Tidal)
 - 0.5% AEP (2115) NPPF (Defended Tidal)
 - 0.1% AEP (Defended Tidal)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000



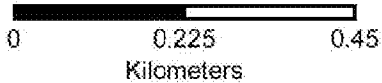


Legend

- Site Boundary
- 0.5% AEP (Un defended Tidal)
- 0.5% AEP (2070) NPPF (Un defended Tidal)
- 0.5% AEP (2115) NPPF (Un defended Tidal)
- 0.1% AEP (Un defended Tidal)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

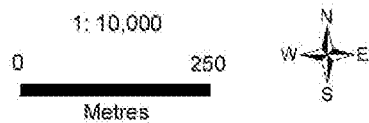
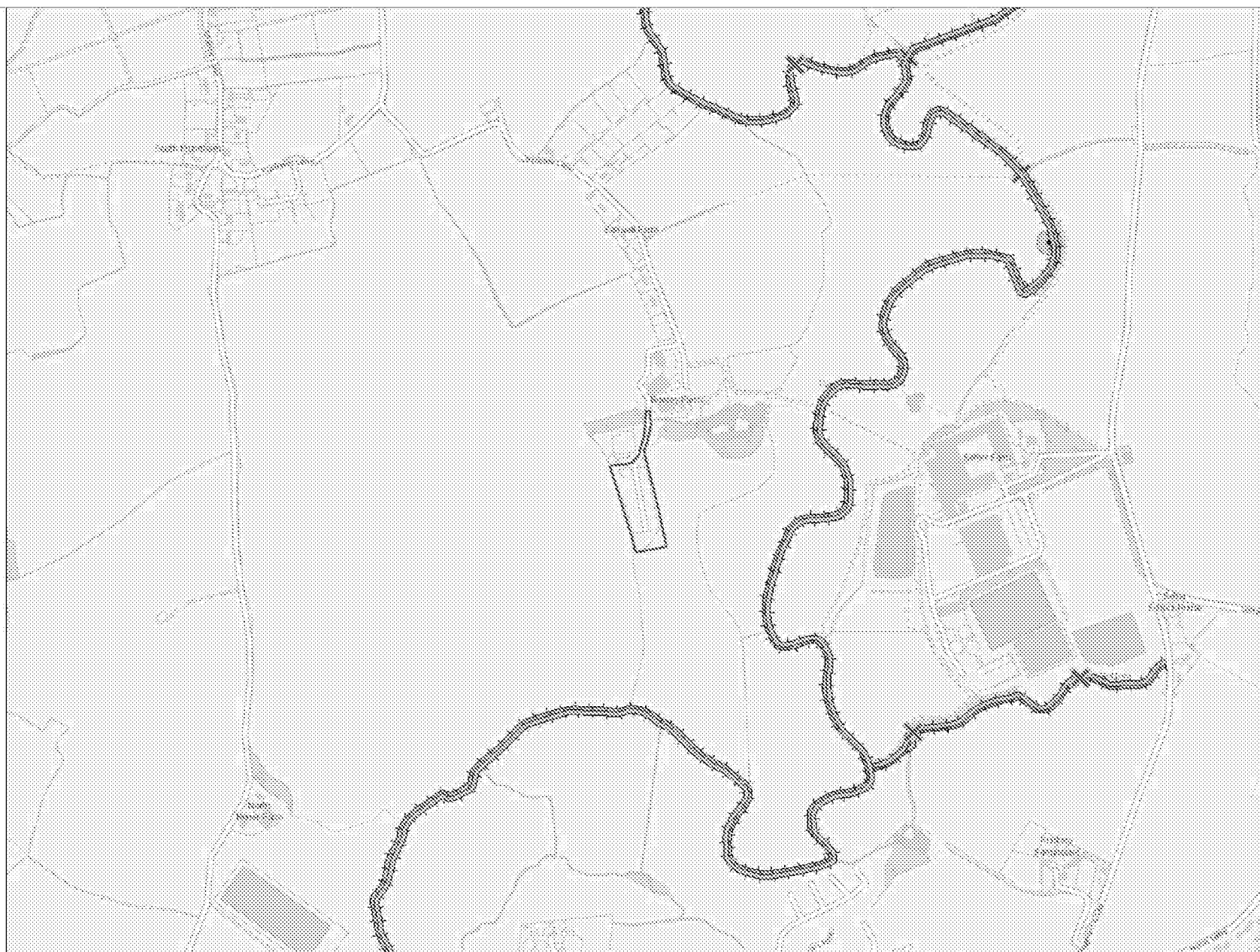
Scale: 1:10,000



AIMS Flood Defences. Centred on PO20 1NB. Generated 08/06/2021.

Legend

Please see page 2 for asset
symbology



Structures

-  Control Gate
-  Draw Off Tower
-  Fish Pass
-  Hydrobrake
-  In Channel Stoplogs
-  Inspection Chamber
-  Jetty
-  Outfall
-  Screen
-  Spillway
-  Stilling Basin
-  Weir

Beach Structures

-  Breakwater
-  Ramp
-  Slipway
-  Steps
-  Groyne

Instruments

-  Active Monitoring
-  Passive Monitoring

Channel Crossings

-  Bridge
-  Utility Services

Aids to Navigation

-  Beacon
-  Buoy
-  Dolphin
-  Signage
-  Signal

Building Assets

-  Pump House

Major Civils

-  Abutment
-  Central Pier

Defences

-  Embankment
-  Wall
-  Flood Gate
-  Demountable defence
-  Bridge abutment
-  High Ground
-  Beach
-  Barrier Beach
-  Promenade
-  Quay
-  Cliff
-  Dunes

Channels

-  Open channel
-  Simple culvert
-  Complex culvert

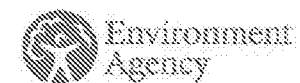
Land

-  Mudflats
-  Saltmarsh
-  Washland

Sites

-  Amenity
-  Control Structure
-  Erosion Protection
-  General
-  Harbour
-  Monitoring
-  Navigation Lock
-  Pumping Station
-  Reservoir
-  Tidal Barrier

Risk of flooding from Surface Water. Centred on PO20 1NB. Generated 08/06/2021.



1: 10,000

0 Metres 250



Likelihood of flooding from Surface Water

- High ($\geq 3.3\%$)
- Medium (3.3% - 1%)
- Low (1% - 0.1%)
- Very Low
- Flood Extent 1 in 30
- Flood Extent 1 in 100
- Flood Extent 1 in 1000

Likelihood of flooding from Surface Water

- High:** Greater than or equal to 3.3% (1 in 30) chance in any given year
- Medium:** Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low:** Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low:** Less than 0.1% (1 in 1,000) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on GOV.UK.



Extent of flooding from surface water

High
 Medium
 Low
 Very low
 Location you selected



Surface water flood risk: water velocity in a low risk scenario

Flood velocity (metres/second)

Over 0.25 m/s Less than 0.25 m/s Direction of water flow Location you selected

EA Base Data from 2016 model Sea Level 3.29 m AOD (for whichever return

Sea Level Rise <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

2000	to	2035	5.7 mm	to	6.9 mm
2036	to	2065	8.7 mm	to	11.3 mm
2066	to	2095	11.6 mm	to	15.8 mm
2096	to	2125	13.1 mm	to	18.2 mm
2016			3.290 m AOD		3.290 m AOD

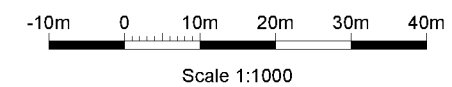
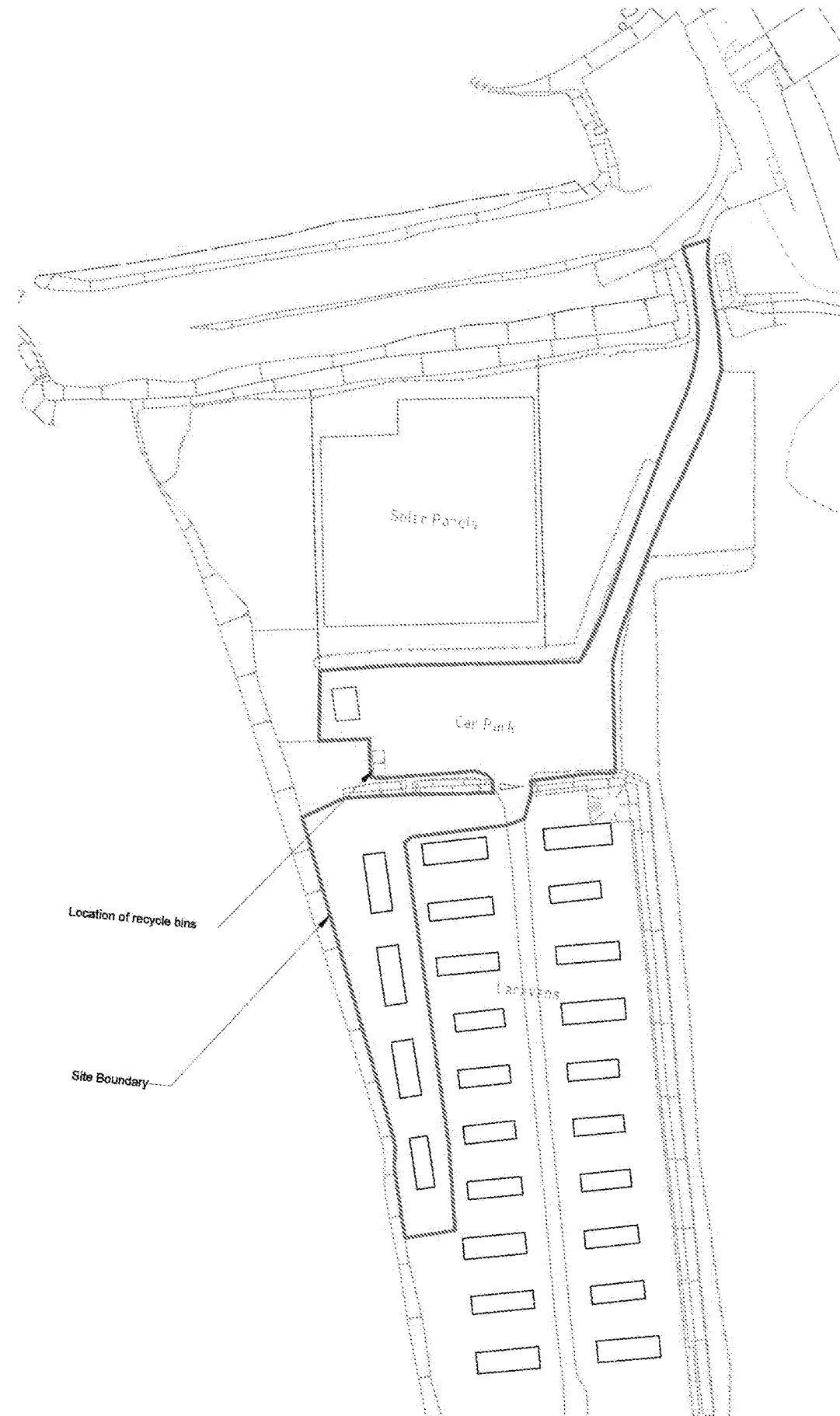
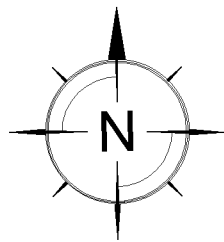
Year	Increase	Higher central	Increase	Upper end
2017	5.7	3.296 m AOD	6.9	3.297 m AOD
2018	5.7	3.301 m AOD	6.9	3.304 m AOD
2019	5.7	3.307 m AOD	6.9	3.311 m AOD
2020	5.7	3.313 m AOD	6.9	3.318 m AOD
2021	5.7	3.319 m AOD	6.9	3.325 m AOD
2022	5.7	3.324 m AOD	6.9	3.331 m AOD
2023	5.7	3.330 m AOD	6.9	3.338 m AOD
2024	5.7	3.336 m AOD	6.9	3.345 m AOD
2025	5.7	3.341 m AOD	6.9	3.352 m AOD
2026	5.7	3.347 m AOD	6.9	3.359 m AOD
2027	5.7	3.353 m AOD	6.9	3.366 m AOD
2028	5.7	3.358 m AOD	6.9	3.373 m AOD
2029	5.7	3.364 m AOD	6.9	3.380 m AOD
2030	5.7	3.370 m AOD	6.9	3.387 m AOD
2031	5.7	3.376 m AOD	6.9	3.394 m AOD
2032	5.7	3.381 m AOD	6.9	3.400 m AOD
2033	5.7	3.387 m AOD	6.9	3.407 m AOD
2034	5.7	3.393 m AOD	6.9	3.414 m AOD
2035	5.7	3.398 m AOD	6.9	3.421 m AOD
2036	8.7	3.407 m AOD	11.3	3.432 m AOD
2037	8.7	3.416 m AOD	11.3	3.444 m AOD
2038	8.7	3.424 m AOD	11.3	3.455 m AOD
2039	8.7	3.433 m AOD	11.3	3.466 m AOD
2040	8.7	3.442 m AOD	11.3	3.478 m AOD
2041	8.7	3.451 m AOD	11.3	3.489 m AOD
2042	8.7	3.459 m AOD	11.3	3.500 m AOD
2043	8.7	3.468 m AOD	11.3	3.512 m AOD
2044	8.7	3.477 m AOD	11.3	3.523 m AOD
2045	8.7	3.485 m AOD	11.3	3.534 m AOD
2046	8.7	3.494 m AOD	11.3	3.545 m AOD
2047	8.7	3.503 m AOD	11.3	3.557 m AOD
2048	8.7	3.511 m AOD	11.3	3.568 m AOD
2049	8.7	3.520 m AOD	11.3	3.579 m AOD
2050	8.7	3.529 m AOD	11.3	3.591 m AOD
2051	8.7	3.538 m AOD	11.3	3.602 m AOD
2052	8.7	3.546 m AOD	11.3	3.613 m AOD
2053	8.7	3.555 m AOD	11.3	3.625 m AOD

2054	8.7	3.564 m AOD	11.3	3.636 m AOD
2055	8.7	3.572 m AOD	11.3	3.647 m AOD
2056	8.7	3.581 m AOD	11.3	3.658 m AOD
2057	8.7	3.590 m AOD	11.3	3.670 m AOD
2058	8.7	3.598 m AOD	11.3	3.681 m AOD
2059	8.7	3.607 m AOD	11.3	3.692 m AOD
2060	8.7	3.616 m AOD	11.3	3.704 m AOD
2061	8.7	3.625 m AOD	11.3	3.715 m AOD
2062	8.7	3.633 m AOD	11.3	3.726 m AOD
2063	8.7	3.642 m AOD	11.3	3.737 m AOD
2064	8.7	3.651 m AOD	11.3	3.749 m AOD
2065	8.7	3.659 m AOD	11.3	3.760 m AOD
2066	11.6	3.671 m AOD	15.8	3.776 m AOD
2067	11.6	3.683 m AOD	15.8	3.792 m AOD
2068	11.6	3.694 m AOD	15.8	3.807 m AOD
2069	11.6	3.706 m AOD	15.8	3.823 m AOD
2070	11.6	3.717 m AOD	15.8	3.839 m AOD
2071	11.6	3.729 m AOD	15.8	3.855 m AOD
2072	11.6	3.741 m AOD	15.8	3.871 m AOD
2073	11.6	3.752 m AOD	15.8	3.886 m AOD
2074	11.6	3.764 m AOD	15.8	3.902 m AOD
2075	11.6	3.775 m AOD	15.8	3.918 m AOD
2076	11.6	3.787 m AOD	15.8	3.934 m AOD
2077	11.6	3.799 m AOD	15.8	3.950 m AOD
2078	11.6	3.810 m AOD	15.8	3.965 m AOD
2079	11.6	3.822 m AOD	15.8	3.981 m AOD
2080	11.6	3.833 m AOD	15.8	3.997 m AOD
2081	11.6	3.845 m AOD	15.8	4.013 m AOD
2082	11.6	3.857 m AOD	15.8	4.029 m AOD
2083	11.6	3.868 m AOD	15.8	4.044 m AOD
2084	11.6	3.880 m AOD	15.8	4.060 m AOD
2085	11.6	3.891 m AOD	15.8	4.076 m AOD
2086	11.6	3.903 m AOD	15.8	4.092 m AOD
2087	11.6	3.915 m AOD	15.8	4.108 m AOD
2088	11.6	3.926 m AOD	15.8	4.123 m AOD
2089	11.6	3.938 m AOD	15.8	4.139 m AOD
2090	11.6	3.949 m AOD	15.8	4.155 m AOD
2091	11.6	3.961 m AOD	15.8	4.171 m AOD
2092	11.6	3.973 m AOD	15.8	4.187 m AOD
2093	11.6	3.984 m AOD	15.8	4.202 m AOD
2094	11.6	3.996 m AOD	15.8	4.218 m AOD
2095	11.6	4.007 m AOD	15.8	4.234 m AOD
2096	13.1	4.020 m AOD	18.2	4.252 m AOD
2097	13.1	4.034 m AOD	18.2	4.270 m AOD
2098	13.1	4.047 m AOD	18.2	4.289 m AOD
2099	13.1	4.060 m AOD	18.2	4.307 m AOD
2100	13.1	4.073 m AOD	18.2	4.325 m AOD
2101	13.1	4.086 m AOD	18.2	4.343 m AOD
2102	13.1	4.099 m AOD	18.2	4.361 m AOD
2103	13.1	4.112 m AOD	18.2	4.380 m AOD

2104	13.1	4.125 m AOD	18.2	4.398 m AOD
2105	13.1	4.138 m AOD	18.2	4.416 m AOD
2106	13.1	4.151 m AOD	18.2	4.434 m AOD
2107	13.1	4.165 m AOD	18.2	4.452 m AOD
2108	13.1	4.178 m AOD	18.2	4.471 m AOD
2109	13.1	4.191 m AOD	18.2	4.489 m AOD
2110	13.1	4.204 m AOD	18.2	4.507 m AOD
2111	13.1	4.217 m AOD	18.2	4.525 m AOD
2112	13.1	4.230 m AOD	18.2	4.543 m AOD
2113	13.1	4.243 m AOD	18.2	4.562 m AOD
2114	13.1	4.256 m AOD	18.2	4.580 m AOD
2115	13.1	4.269 m AOD	18.2	4.598 m AOD
2116	13.1	4.282 m AOD	18.2	4.616 m AOD
2117	13.1	4.296 m AOD	18.2	4.634 m AOD
2118	13.1	4.309 m AOD	18.2	4.653 m AOD
2119	13.1	4.322 m AOD	18.2	4.671 m AOD
2120	13.1	4.335 m AOD	18.2	4.689 m AOD
2121	13.1	4.348 m AOD	18.2	4.707 m AOD
2122	13.1	4.361 m AOD	18.2	4.725 m AOD
2123	13.1	4.374 m AOD	18.2	4.744 m AOD
2124	13.1	4.387 m AOD	18.2	4.762 m AOD
2125	13.1	4.400 m AOD	18.2	4.780 m AOD

Appendix 4

Proposed Site Layout Plan



TITLE Proposed Site Layout Plan			
SCALE 1:1000 @ A3		PROJECT No. 23548	
REPORT TYPE FRA		DRG. No. 03	