

ATI-17731a – ABP Newport

E:331375 N:184175

1.0 Current Flood Map

Figure 1 shows the current Flood Map (version 201905) at this location. The Flood Map represents a combination of the undefended fluvial and tidal flood extents derived from a combination of detailed local and generalised national model data.

More information on the Flood Map can be obtained from the Natural Resources Wales website <http://www.naturalresources.wales/floodriskmap>

2.0 Local Flood Risk Mapping Study

Model Summary

This study (v6) was commissioned to update the Newport flood model. This study uses new tidal level predictions derived from the Caldicot and Wentlooge Coastal study, together with new updates to landform changes in the area (*ref 5*).

The baseline model included the improved Riverside tidal defences complete in summer 2012 and the Caerleon defence improvements completed July 2016.

The model was run for undefended and defended tidal flood events for 2015* and defended tidal events with climate change. QMED was used for fluvial inflows for all design runs.

Changes in sea level used in the model are shown in **Table 1** (*ref 2*).

Table 1: Sea Level Rise (mm per year)

Assumed vertical land movement	1990-2025	2025-2055	2055-2085	2085+
-0.5	3.5	8.0	11.5	14.5

Results

The shape for the site has been used to query the elevation, depth, velocity and hazard grids to provide the results in **Tables 3, 5 and 7**. These results all relate to a base year of 2015.

To get water elevation results for 2019 and future years, model results have been interpolated, the results are shown in **Tables 4 and 6**.

The depth grids for the defended tidal 1 in 200 (2090) excluding confidence intervals and 1 in 200 (2090) including confidence intervals, are shown in **Figures 2 and 3**.

The hazard grid for the defended 1 in 200 year with future climate change including confidence interval is shown in **Figure 4**.

Table 2: Legend for Hazard Grids

Flood Hazard Rating (HR)	Colour Code	Hazard to People Classification (<i>ref 6</i>)
Less than 0.75		Very low hazard – Caution
0.75 to 1.25		Danger for some – includes children, the elderly and the infirm
1.25 to 2.0		Danger for most – includes the general public
More than 2.0		Danger for all – includes the emergency services

*Interpolated results generate tide levels for current day (2019) and future climate change scenarios (2094/2119). These results use the model base year (2015); the sea level rise values from **Table 1** are then added to the elevation values in the model results Tables. For example, to get data for 2094: 14.5mm x 4 (years) = 58mm or 0.058m which can be added to the elevation max value in the results tables.

Model Results - the Site

Null values show that the site is flood free for that return period.

Table 3: Defended Model Results – Median values

Defended (excluding upper confidence interval)						
	1 in 200			1 in 1000		
	2015	2090	2115	2015	2090	2115
Model Grid Size (m)	5	5	5	5	5	5
Wet Cells	1469	1881	1881	1722	1881	1881
Elevation, mean (mAOD)	8.49	9.17	9.53	8.81	9.48	9.87
Elevation, max (mAOD)	8.50	9.18	9.55	8.82	9.50	9.87
Depth, mean (m)	0.46	0.98	1.34	0.69	1.29	1.68
Depth, max (m)	1.07	1.76	2.12	1.39	2.08	2.45
Velocity, mean (m/s)	0.14	0.26	0.53	0.17	0.52	0.60
Velocity, max (m/s)	0.89	1.11	2.02	0.99	1.87	2.15
Hazard, mean	1.17	1.60	2.09	1.32	2.02	2.28
Hazard, max	1.61	2.09	2.59	1.79	2.52	2.78

Table 4: Defended Interpolated Results (2019)*

Defended (excluding upper confidence interval)						
	1 in 200			1 in 1000		
	2019	2094	2119	2019	2094	2119
Elevation, max (mAOD)	8.56	9.24	9.60	8.88	9.56	9.93

Table 5: Defended Model Results – Upper Confidence

Defended (including upper confidence interval)				
	1 in 200			1 in 1000
	2015	2090	2115	2015
Model Grid Size (m)	5	5	5	5
Wet Cells	1632	1881	1881	1881
Elevation, mean (mAOD)	8.70	9.35	9.74	9.30
Elevation, max (mAOD)	8.71	9.37	9.75	9.31
Depth, mean (m)	0.61	1.16	1.56	1.11
Depth, max (m)	1.28	1.95	2.33	1.89
Velocity, mean (m/s)	0.16	0.35	0.57	0.31
Velocity, max (m/s)	0.92	1.33	1.98	1.20
Hazard, mean	1.29	1.84	2.18	1.76
Hazard, max	1.75	2.32	2.69	2.24

Table 6: Defended Interpolated Results (2019)*

Defended (including upper confidence interval)				
	1 in 200			1 in 1000
	2019	2094	2119	2019
Elevation, max (mAOD)	8.77	9.43	9.81	9.37

Table 7: Undefended Model Results – Median Values

Undefended (2015)		
	1 in 200	1 in 1000
Model Grid Size (m)	5	5
Wet Cells	1465	1717
Elevation, mean (mAOD)	8.49	8.81
Elevation, max (mAOD)	8.49	8.82
Depth, mean (m)	0.46	0.69
Depth, max (m)	1.07	1.39
Velocity, mean (m/s)	0.14	0.17
Velocity, max (m/s)	0.93	0.93
Hazard, mean	1.18	1.32
Hazard, max	1.63	1.77

Model Results – Emergency Access to Site

An access route was not provided

3.0 Additional Information

We hold no historic flooding information in this area.

The local authority may be able to provide information on issues such as localised flooding from sewers, drains and culverts.

4.0 References

1. Tidal Flood Mapping Study (Aberthaw to Undy), Study report Issue 2, NRW June 2013.
Tidal Flood Mapping Study (Penarth to Chepstow), Atkins July 2008
2. Department for Environment, Food and Rural Affairs, 2011. *Technical Report Design sea levels*. R&D Report SC060064. Defra/Environment Agency
3. Flood and Coastal Defence Appraisal Guidance: FCDPAG3 Economic Appraisal. Supplementary Note to Operating Authorities – Climate Change Impacts; October 2006; Department for Environment, Food and Rural Affairs.
4. Using the national coastal flood boundary data for England and Wales, Environment Agency Operational Instruction 490_11, Issued 4/2/2011
5. Newport Velocity Depth Mapping - Update: v6, NRW, September 2016.
6. Supplementary note on flood hazard ratings and thresholds for development planning and control purpose, May 2008

5.0 Notes

Undefended scenarios are provided as being a possible worst-case scenario in the event of defence failure. They are used as the basis of the Flood Map.

This model will be run at 3-year intervals to update the model with the increasing sea level rise values. If there are discrepancies in the current year and the base year of the model, please see p1 for details on how sea level rise is added to the elevation values (Interpolated results tables).

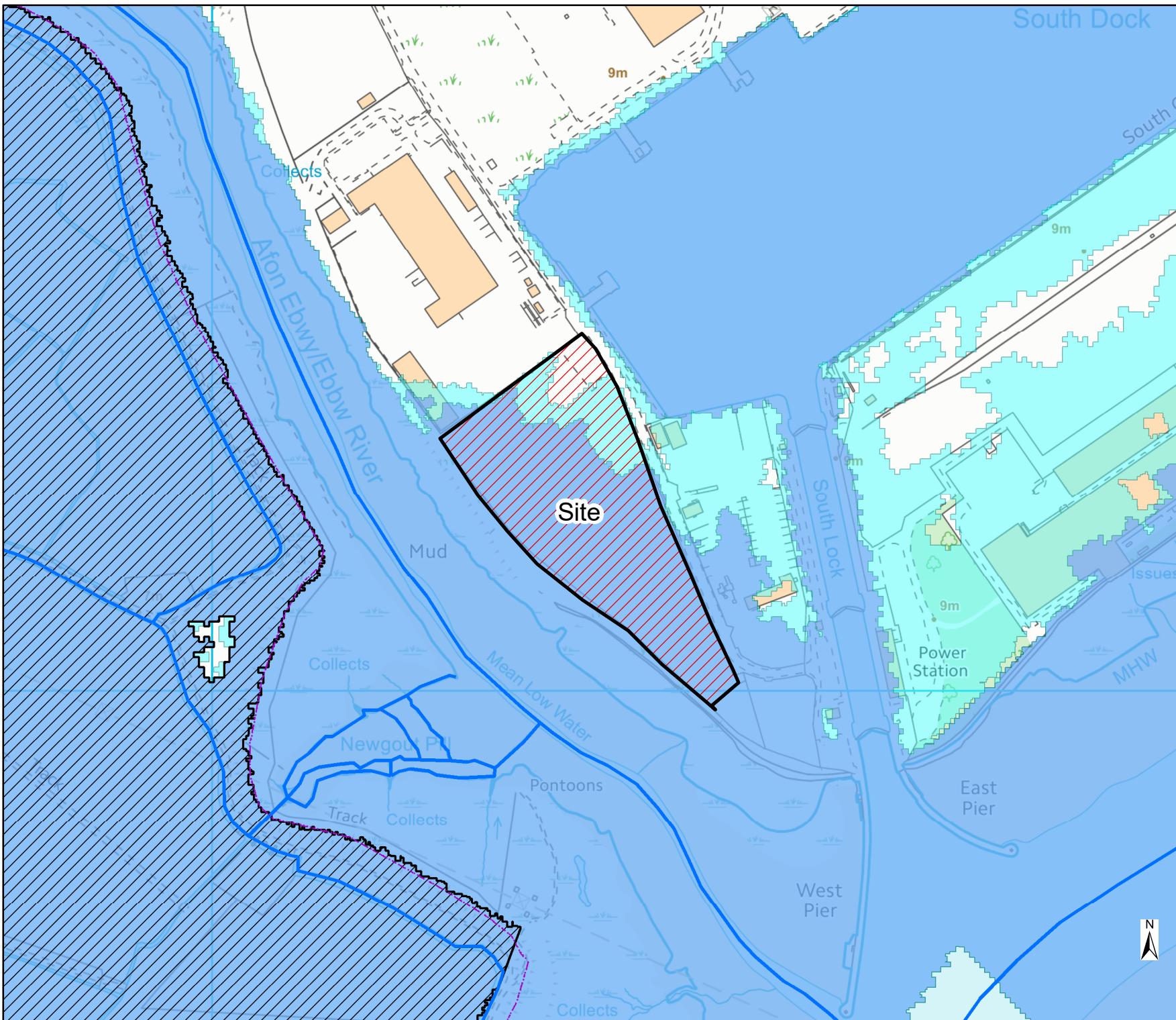
The scope of the model is the mapping of flood risk, it is not intended for detailed design. The model should be considered as the starting point for more detailed modelling, commensurate with the consequences of flooding at the site of interest.

NRW models are available under licence agreement for the purpose of further development. Contact Natural Resources Wales Data Distribution team for details of terms, conditions and pricing.








If the data is used in support of an FCA, please include the reference number.

Please refer to NRW standard terms and conditions.

Flood Risk Analysis
16/07/2019



Legend

-  Site
-  Defences
-  Main Rivers
-  Areas Benefiting from Defences
-  Flood Storage Areas
-  Flood Zone 3
-  Flood Zone 2

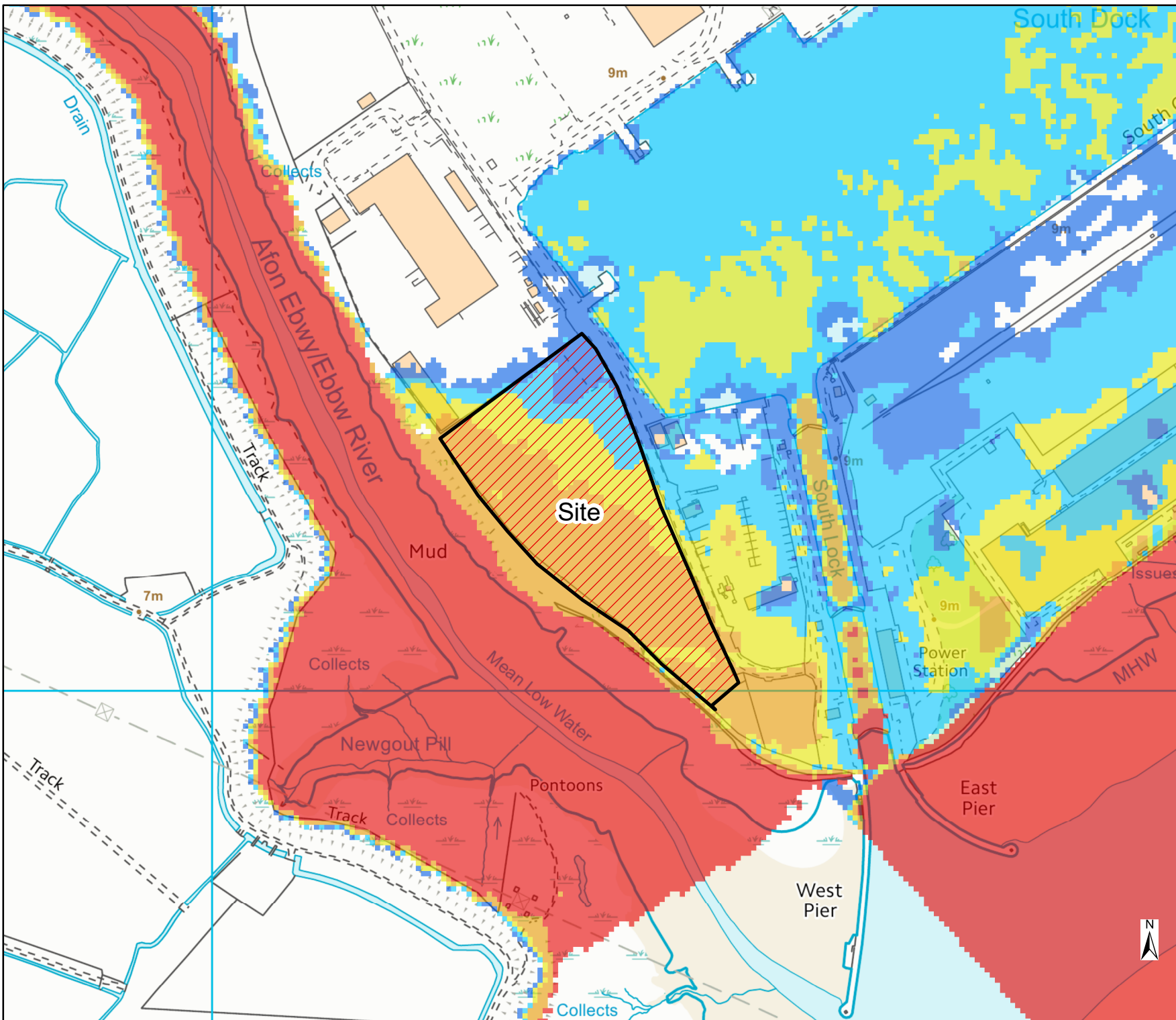
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Drawing
 Figure 1:
 Current Floodmap
 [v201905]

Date 16 Jul 2019

Scale 1:5,000



Legend

-  Site
- T200 2090 (Depth)**
-  < 0.3
-  0.3 - 0.6
-  0.6 - 1.0
-  1.0 - 2.0
-  > 2

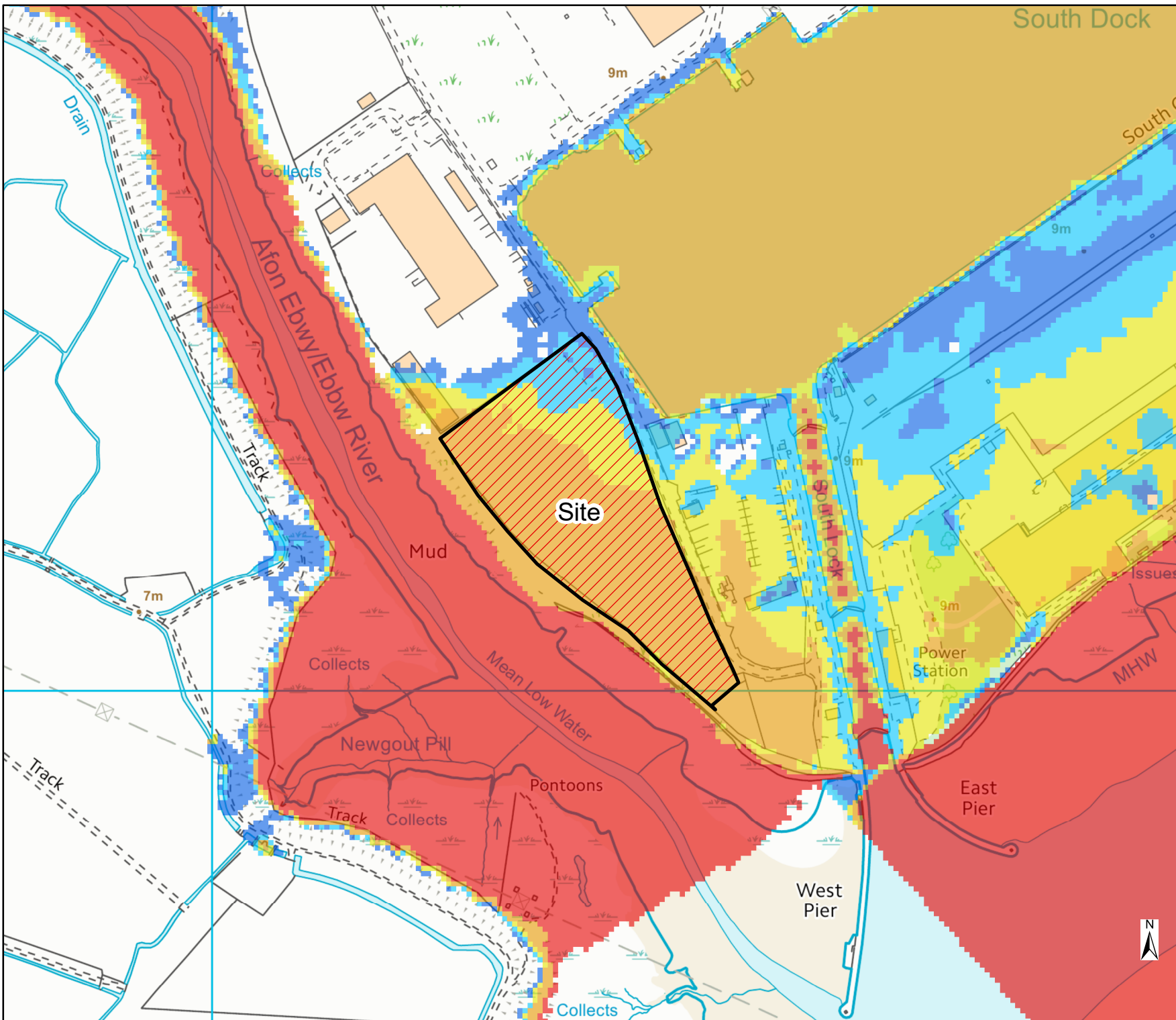
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Drawing
 Figure 2:
 Depth Grid for 0.5% AEP
 (1 in 200) year event - defended
 excluding upper confidence
 intervals (2090 Commercial)

Date 16 Jul 2019

Scale 1:5,000



Legend

 Site

T200 2090 +CI (Depth)

-  <math>< 0.3</math>
-  0.3 - 0.6
-  0.6 - 1.0
-  1.0 - 2.0
-  > 2

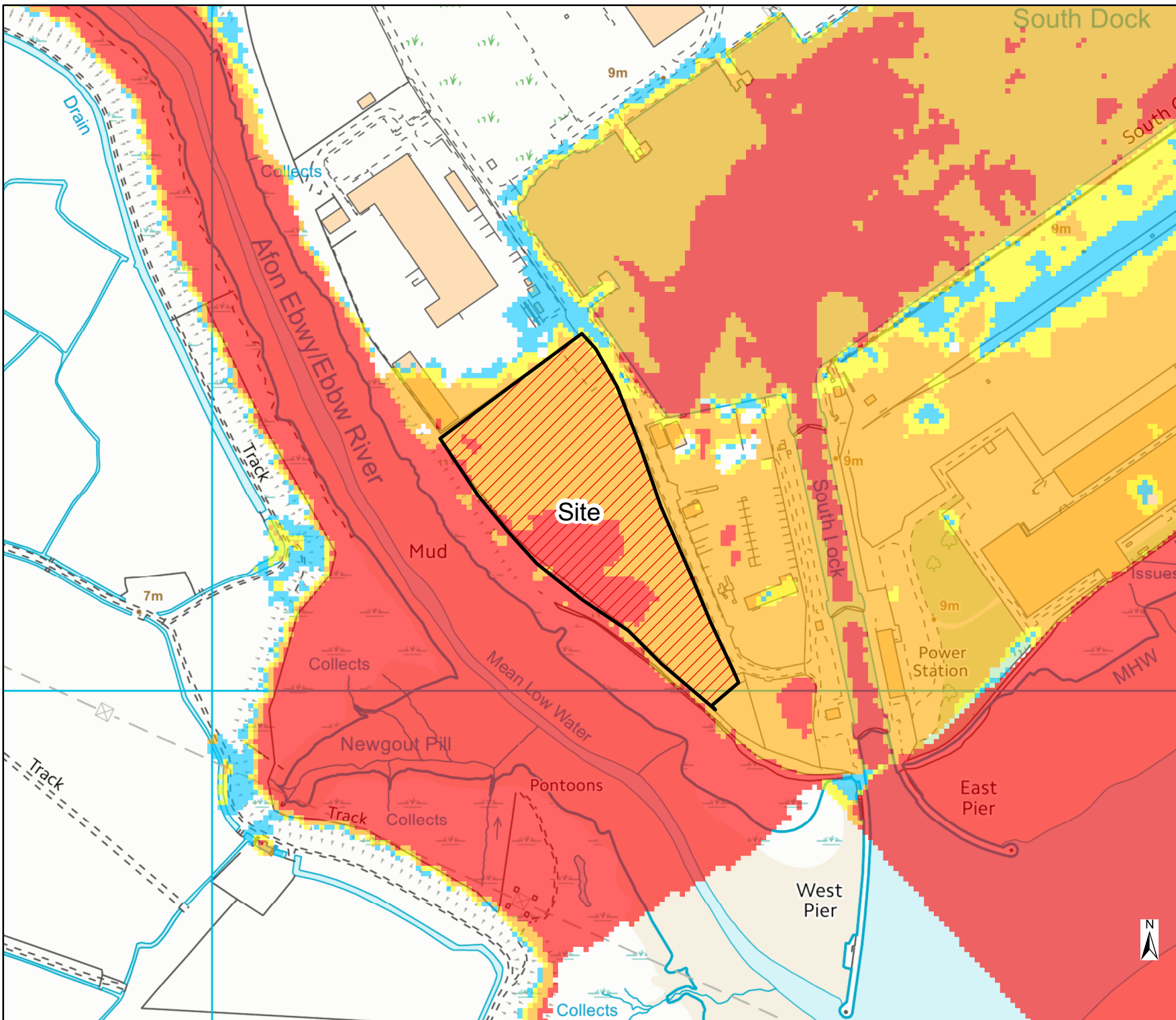
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Drawing
 Figure 3:
 Depth Grid for 0.5% AEP
 (1 in 200) year event - defended
 including upper confidence
 intervals (2090 Commercial)

Date 16 Jul 2019

Scale 1:5,000



Legend

 Site

T200 2090 +CI (Hazard)

-  < 0.75
-  0.75 - 1.25
-  1.25 - 2.00
-  > 2.00

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Project

ABP Newport (Ref:ATI-17731a)

Drawing

Figure 4:
Hazard Grid for 0.5% AEP
(1 in 200) year event - defended
including upper confidence
intervals (2090 Commercial)

Date 16 Jul 2019

Scale 1:5,000