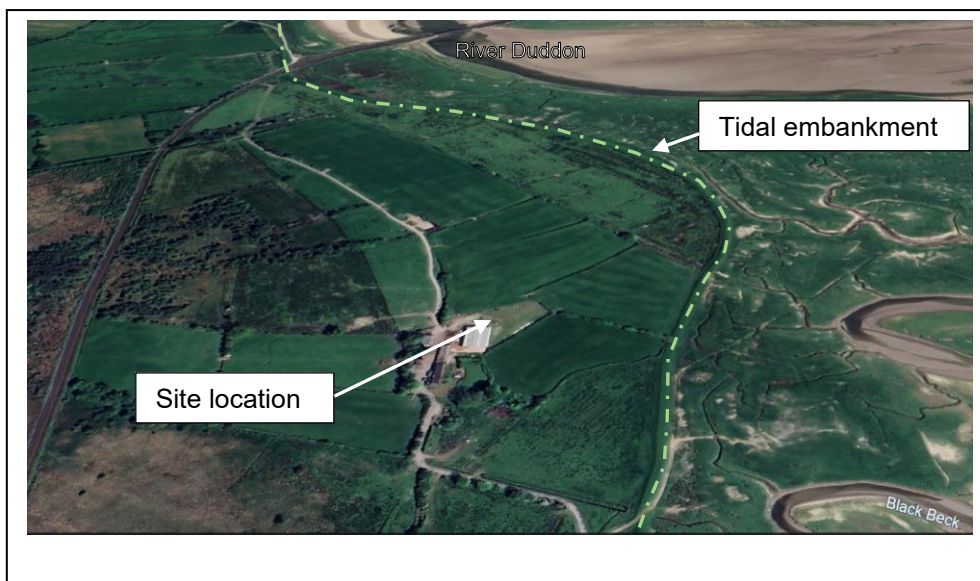


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Flood Risk Assessment For

Agricultural buildings at
Low Shaw Farm
The Green
Millom
Cumbria
LA18 5JD

October 2025



Low Shaw Farm and Millom Marshes Embankment © Google Earth

Version	Prepared by	Non-Technical Review by	Date
Draft	Rachel Gerrard	Phil Gerrard	3 October 2025
Final	Rachel Gerrard	Phil Gerrard	8 October 2025

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The contents of this FRA follows the Site Specific Flood Risk Assessment checklist as specified in the Flood Risk and Coastal change guidance at:

<https://www.gov.uk/guidance/flood-risk-and-coastal-change#contents>

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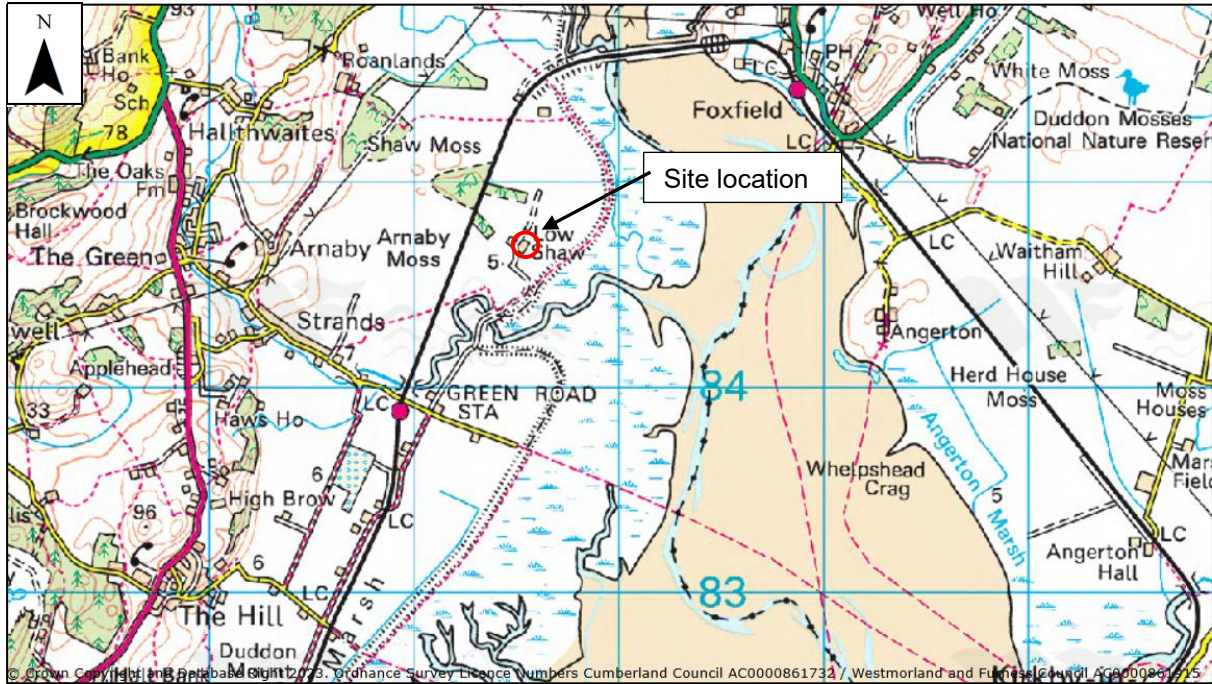
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1 - Development Site and Location

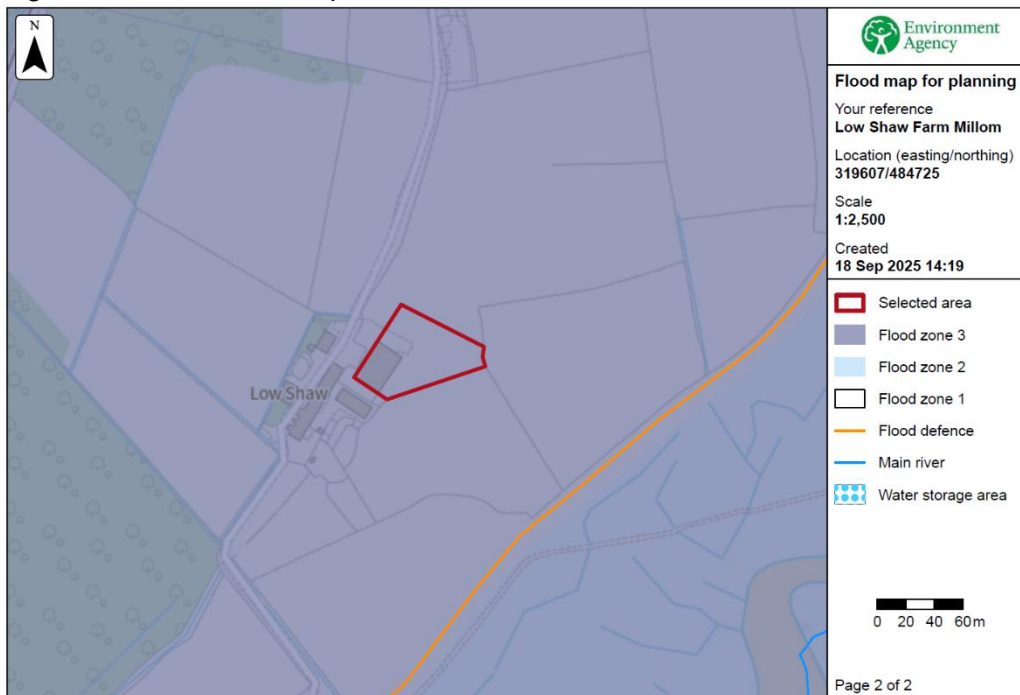
- a. The site at Low Shaw Farm, The Green, Millom, LA18 5JD, is on the west side of the Duddon Estuary 5 km North-north-east of Millom. NGR SD196847. See Figure 1 – Location Plan.

Figure 1 Location plan



- b. The current land use is agricultural.
c. The land is in Flood Zone 3, see Figure 2 below.
d. The site is at risk from Surface Water flooding and reservoir flooding. See Appendix A.

Figure 2 Flood Zones map Low Shaw Farm



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2 - Development Proposals

- a. The development proposals are to extend the existing cattle barn and construct a new slurry store . See Figure 3 below.

Figure 3 Site Plan

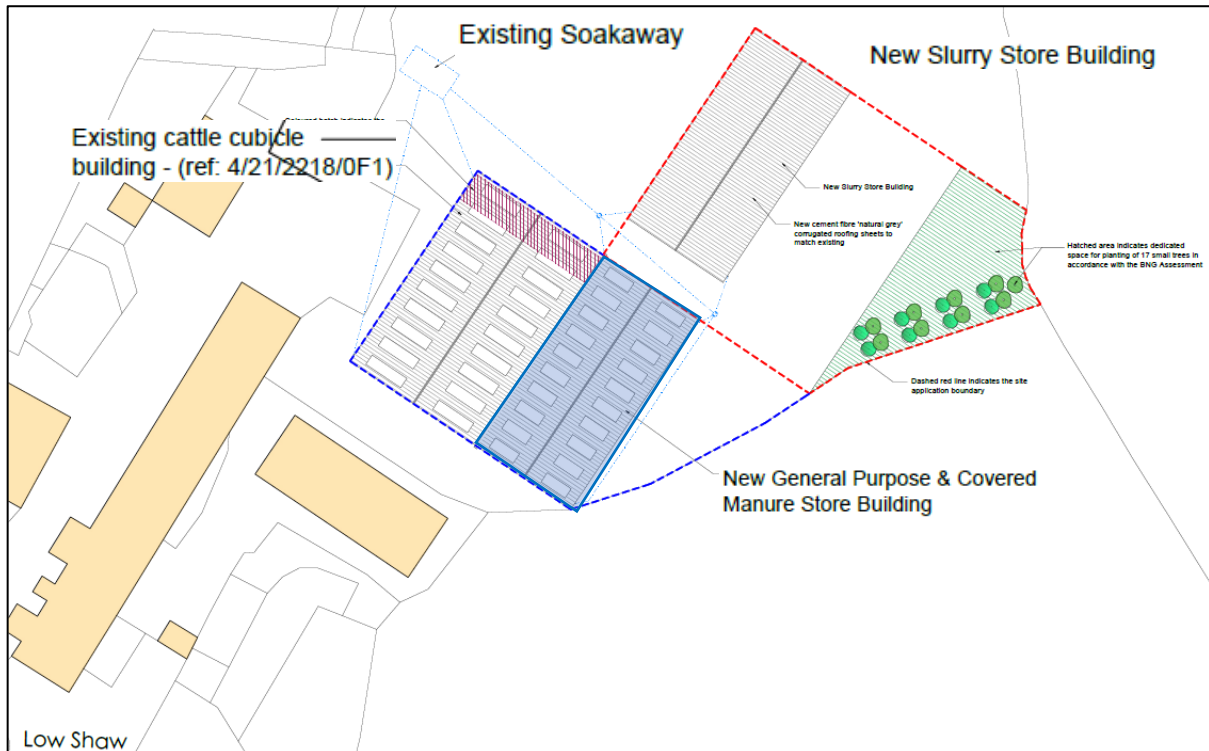
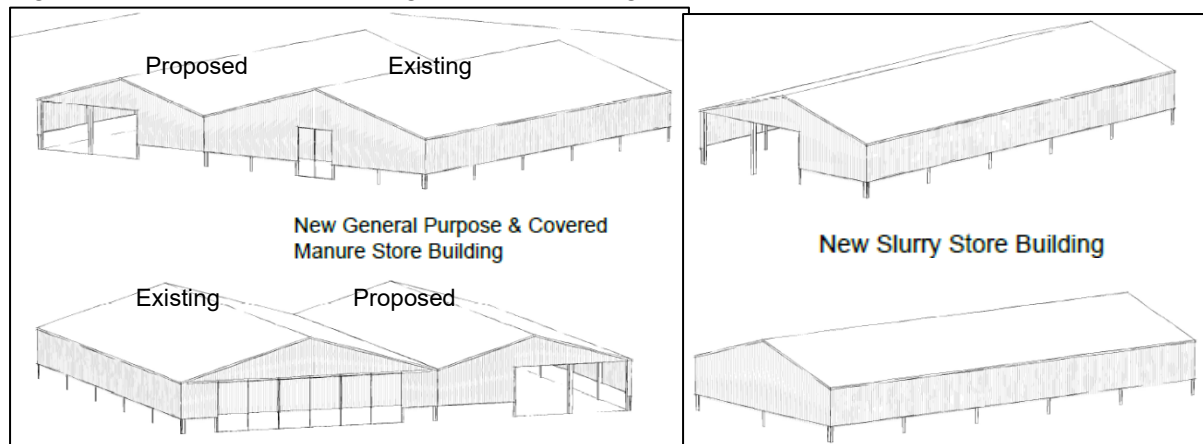


Figure 4 3D sketches of new agricultural buildings



The buildings have concrete panels extending approximately 1m from the ground around the perimeter at ground level, except for the openings for access.

The existing ground levels at the site are at approximately 5.5m AOD for the Slurry store and 5.35m AOD for the general purpose extension.

- b. The flood risk vulnerability classification of the proposed development is “Less Vulnerable”.
- c. For Flood Risk Assessment purposes, the expected lifetime would be 50 years.

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3 - Sequential Test

The farm is centred on this location, with the proposed agricultural buildings purpose integral to the current farms operations. The farm benefits from the tidal defences of the Duddon Estuary embankment.

4 - Climate change

The potential flood risk at the site will increase with climate change. The Climate change allowances for a 'Less Vulnerable' development in a Flood Zone 3 for Sea Level rise requires the use of the higher central allowance. In the North West, for a development with an expected lifespan until 2075, the higher central allowance rise in sea levels for climate change is 477mm. The model provided by the Environment Agency uses an increase of 600mm so this has been used in this assessment.

Flood maps provided by the Environment Agency show that the climate change level for the Defended 0.5% (200yr) flood including a 600 mm allowance will be 6.94 m AOD.. If the embankment were to fail the undefended climate change 0.5% plus 600mm is 7.04m AOD. See Appendix C. The tidal embankment is at low risk of water overtopping and erosion due to it's sheltered position from the westerly winds. See Appendix D.

5 - Site Specific Flood Risk

The site benefits from the Duddon flood defence embankment which lies north-south close to the site and has a crest level between 6.38m AOD and 6.72m AOD, although there is a low spot of 5.09m AOD, which compromises the defence, which will need to be identified and repaired by the landowner in co-operation with the Environment Agency.

- a. The main source of flooding to the site is tidal flooding from the Duddon Estuary. See Figure 2.
- b. From Environment Agency flood maps the probability of the site flooding is 0.1% See map Appendix C.
- c. Surface water and Reservoir flood maps (see Appendix A) show that the site is at risk of flooding from this sources. The surface water flood risk is high probability but low depth (hazard) and crosses the site to the north of the new buildings.
- d. The design (0.5%) defended flood height with an allowance of 600mm for climate change is 6.94m AOD. The existing site ground level is 5.35-5.5m AOD giving depth of flooding of approximately 1.59m.
- e. The agricultural buildings will be expected to flood in the design flood to a depth of 1.59m. The building will be used for slurry and manure storage so will suffer limited damage from water ingress.
- f. The predicted climate change flood level is 6.94m AOD. The base of the buildings is made of a concrete panel to approximately 1m from ground level, which will offer some protection from flood water. All electrical services will be mounted a minimum of 2m from the ground level. The site benefits from two flood warnings the Cumbrian coastline at Duddon estuary, between Haverigg, Duddon Bridge, Dunnerholme and A595. And The Duddon Estuary flood warning area.
- g. The development will not cause increased flood risk elsewhere as the structures footprint is small in comparison to the tidal floodplain.
- h. There are no opportunities offered by the development to reduce the causes or impacts of flooding.

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- i. The flood information used to inform the risk level for this assessment have been taken from the Duddon Sands Tidal 2012 model obtained from the Environment Agency. A modelled data source gives the highest level of certainty to the assessment.

6 - Surface Water Management

The new buildings will be added to the existing soakaway system and maintained by the landowner.

7 - Occupants and Users of the Development

The users of the new agricultural buildings won't change from the existing requirements on the site, there will not change nature and times of use.

8 – Exception Test

An exception test is not required as this is a Less Vulnerable development in flood zone 3a.

9 - Residual Risk

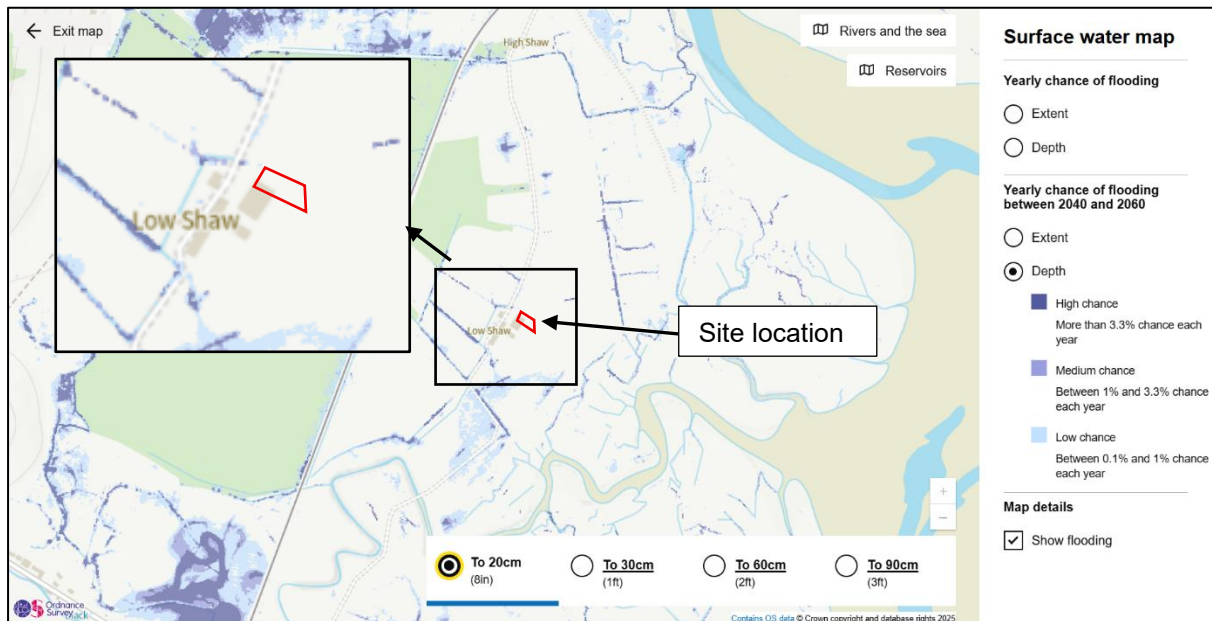
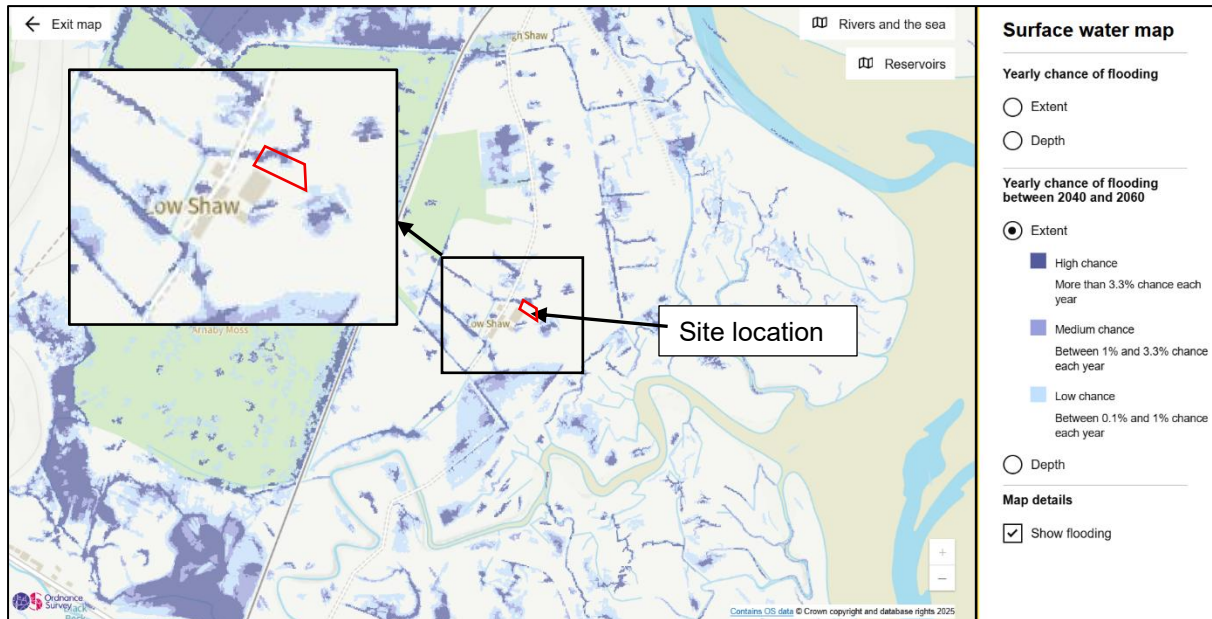
- a. Tidal flood risk will always remain at the site due to its location.
- b. Over the lifetime of the development any increase in flood risk will be managed by the landowners.

10 - Flood Risk Assessment credentials

This Flood Risk Assessment has been produced and written by Rachel Gerrard B.Eng C.Eng MICE, completed October 2025.

APPENDIX A – Other sources of Flood Risk

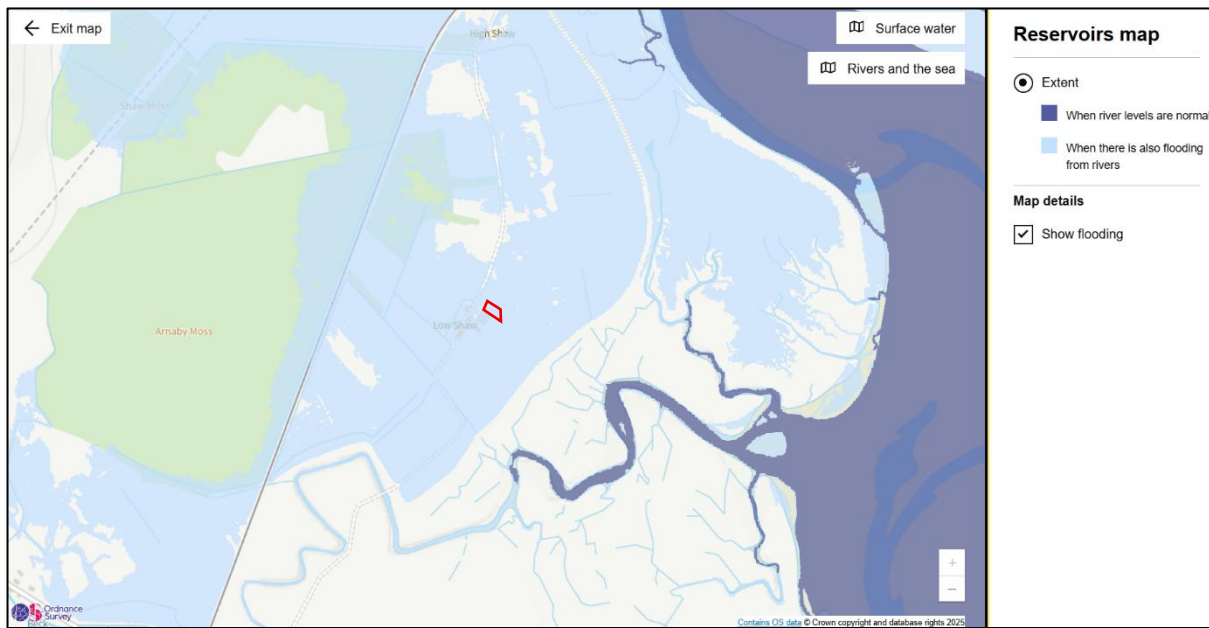
Surface Water Flood Risk



Although the surface water flood risk at the site is due to increase with climate change the depth of flooding is predicted to be less than 20cm so the hazard is low even though there is a high chance of a surface water flooding occurring at the site.

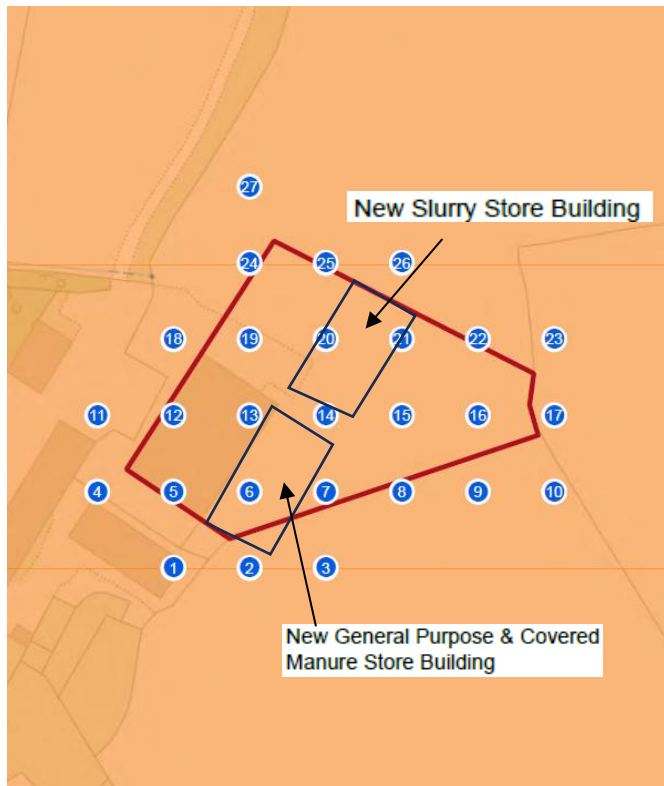
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Reservoir flood risk



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APPENDIX B – Topographic Survey



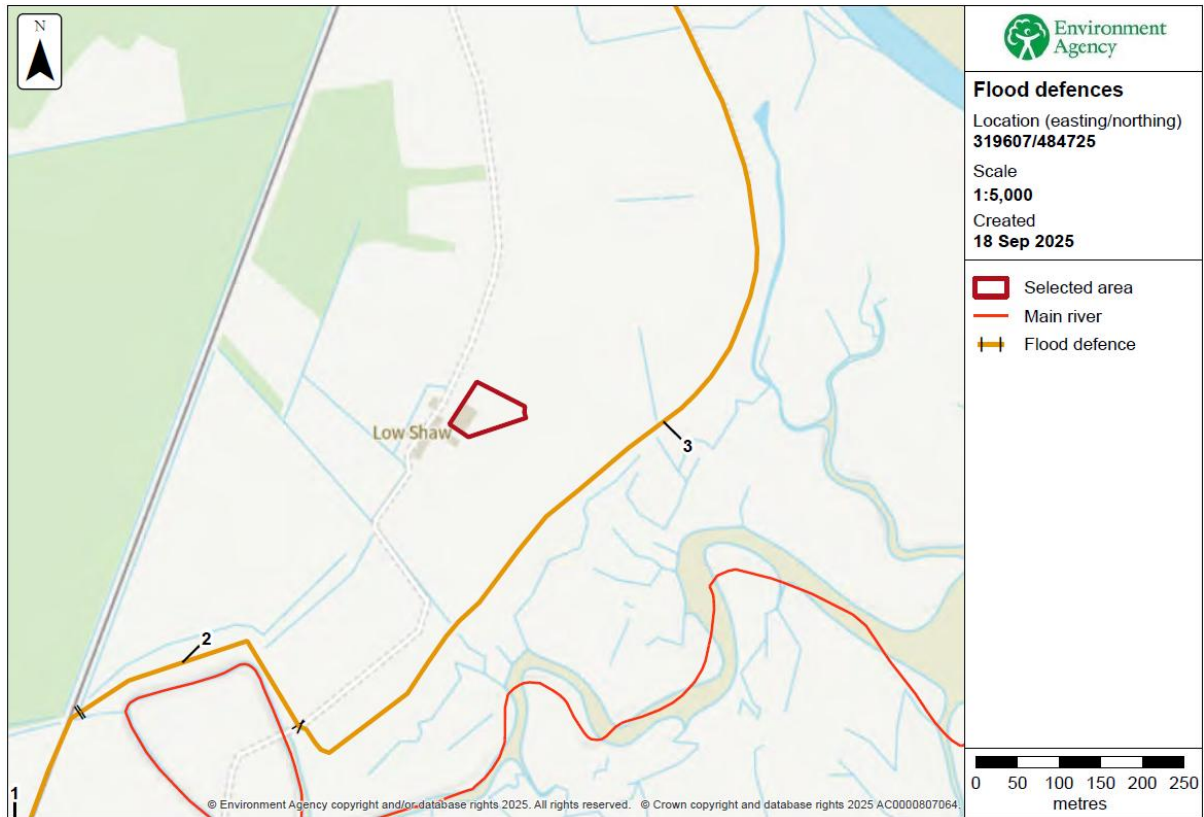
Location Number	Flood height (mAOD)	Depth (m)	Level (mAOD)	
1	6.62	1.25	5.37	
2	6.62	1.26	5.36	
3	6.62	1.23	5.39	
4	6.62	1.15	5.47	
5	6.62	1.24	5.38	
6	6.62	1.28	5.34	extension
7	6.62	1.22	5.40	extension
8	6.62	1.15	5.47	
9	6.62	1.27	5.35	
10	6.62	1.25	5.37	
11	6.62	1.07	5.55	
12	6.62	1.12	5.50	
13	6.62	1.13	5.49	
14	6.62	1.06	5.56	slurry store
15	6.62	1.1	5.52	
16	6.62	1.18	5.44	
17	6.62	1.19	5.43	
18	6.62	1.05	5.57	
19	6.62	1.09	5.53	
20	6.62	1.14	5.48	slurry store
21	6.62	1.09	5.53	slurry store
22	6.62	0.97	5.65	
23	6.62	1.02	5.60	
24	6.62	1.13	5.49	
25	6.62	1.14	5.48	
26	6.62	1.15	5.47	
27	6.62	1.11	5.51	

Slurry store approx. 5.5m AOD. Extension building approx. 5.35m AOD.

Environment Agency flood data used to obtain approximate ground levels.

APPENDIX C – Environment Agency Information

Flood Defence information



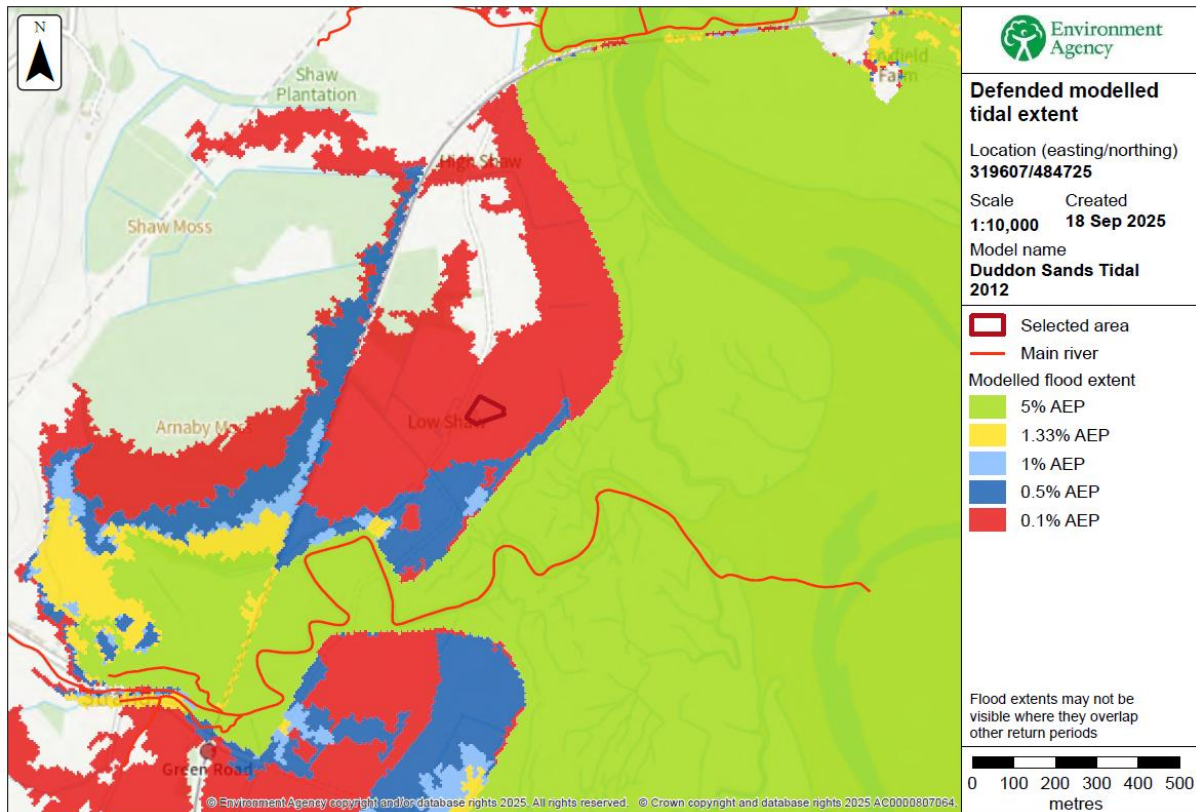
Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	176650	Embankment	100	Fair			5.93
2	175177	Embankment	100	Fair			6.20
3	86249	Embankment	100	Fair	6.38	6.72	5.09

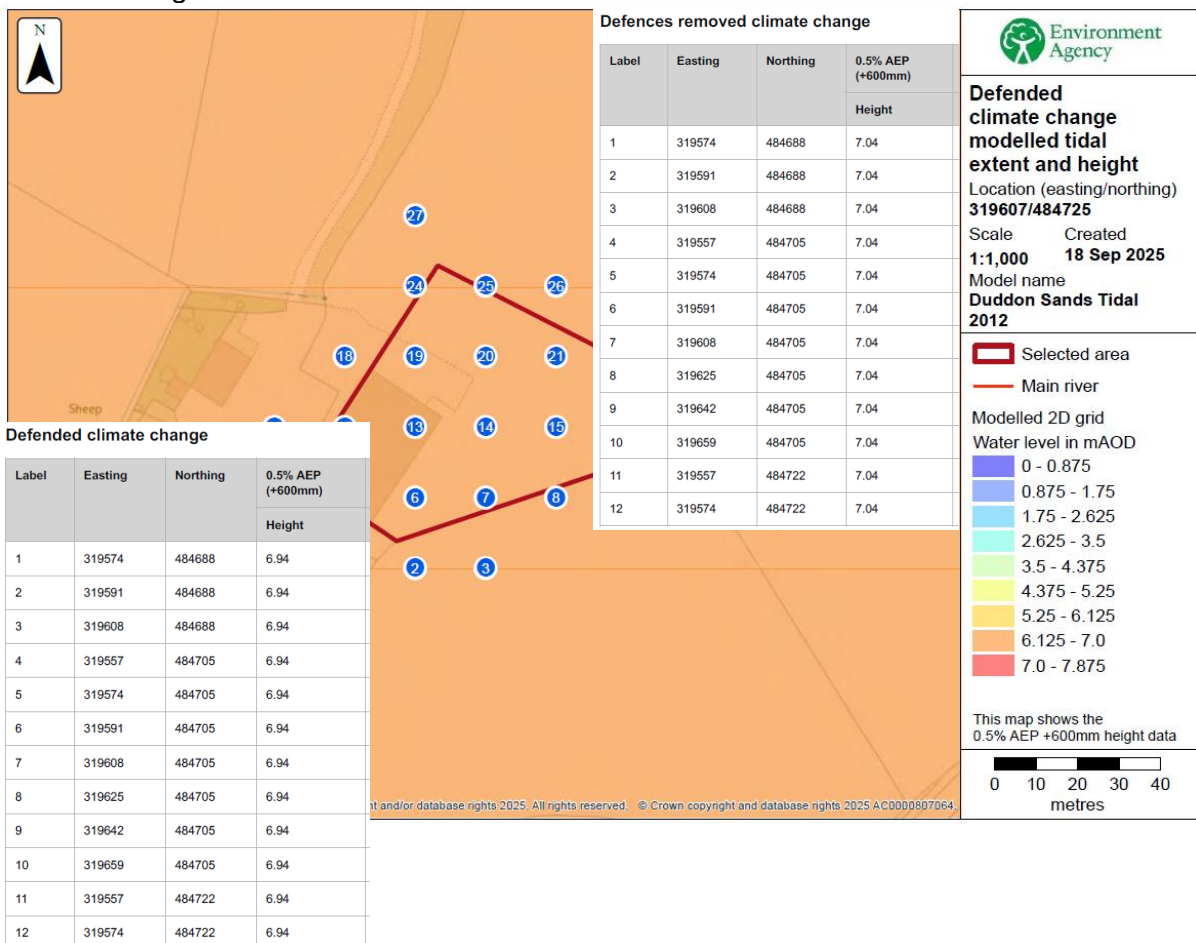
Any blank cells show where a particular value has not been recorded for an asset.

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Modelled flood extents from the Duddon Sands Tidal 2012 model



Climate change flood levels



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APPENDIX D – Tidal Flood Embankment

The Millom Marsh flood embankment protects the site from the Duddon Sands tidal flooding, The embankment on the West side of the estuary is protected from the prevailing winds and therefore not subject to wave overtopping or coastal erosion. See assessment below.

Duddon Estuary To Tarn Point Management Area Summary 2014

Copeland Borough Council

Risk Assessment

The primary risks arising from the behaviour of coastal forcing processes (wind, waves and tides) and the reaction of the shoreline (beach and cliff changes, artificial defence conditions) across this frontage are:

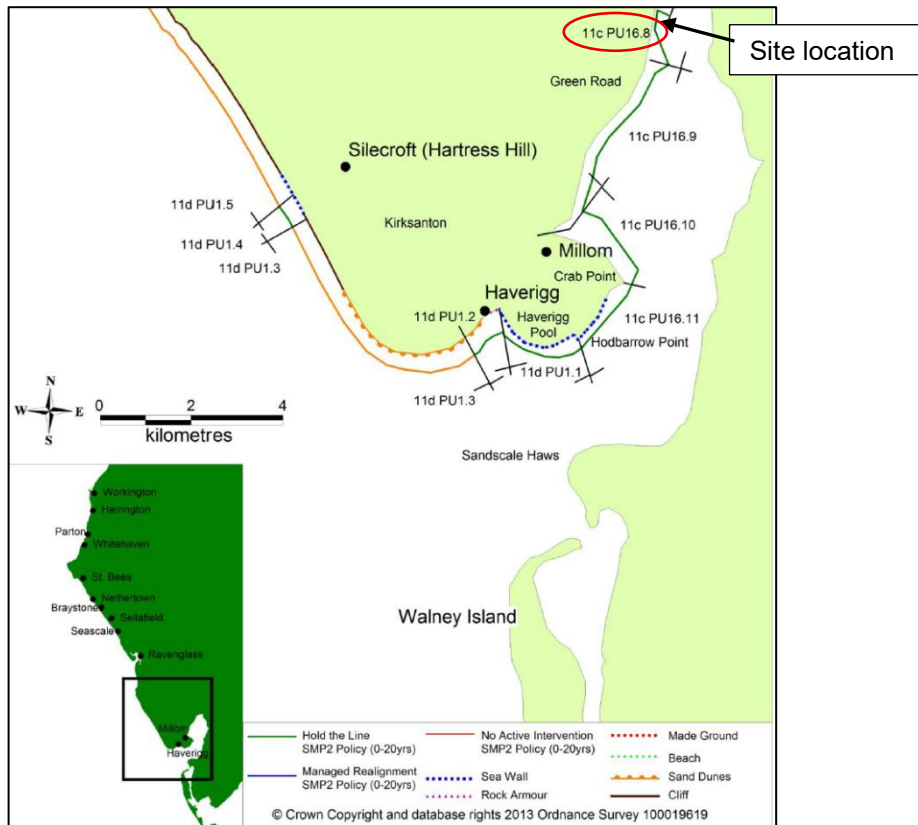
- Overtopping of artificial defences causing flooding of the hinterland,
- Breaching of artificial coastal defences, causing erosion of the shoreline
- Erosion of dunes and cliffs providing potential pathways for water penetration into the hinterland
- Wind blown sand nuisance to people and property

The primary consequences of this behaviour are:

- Damage to and/or loss of property and infrastructure
- Damage to environmental habitats.

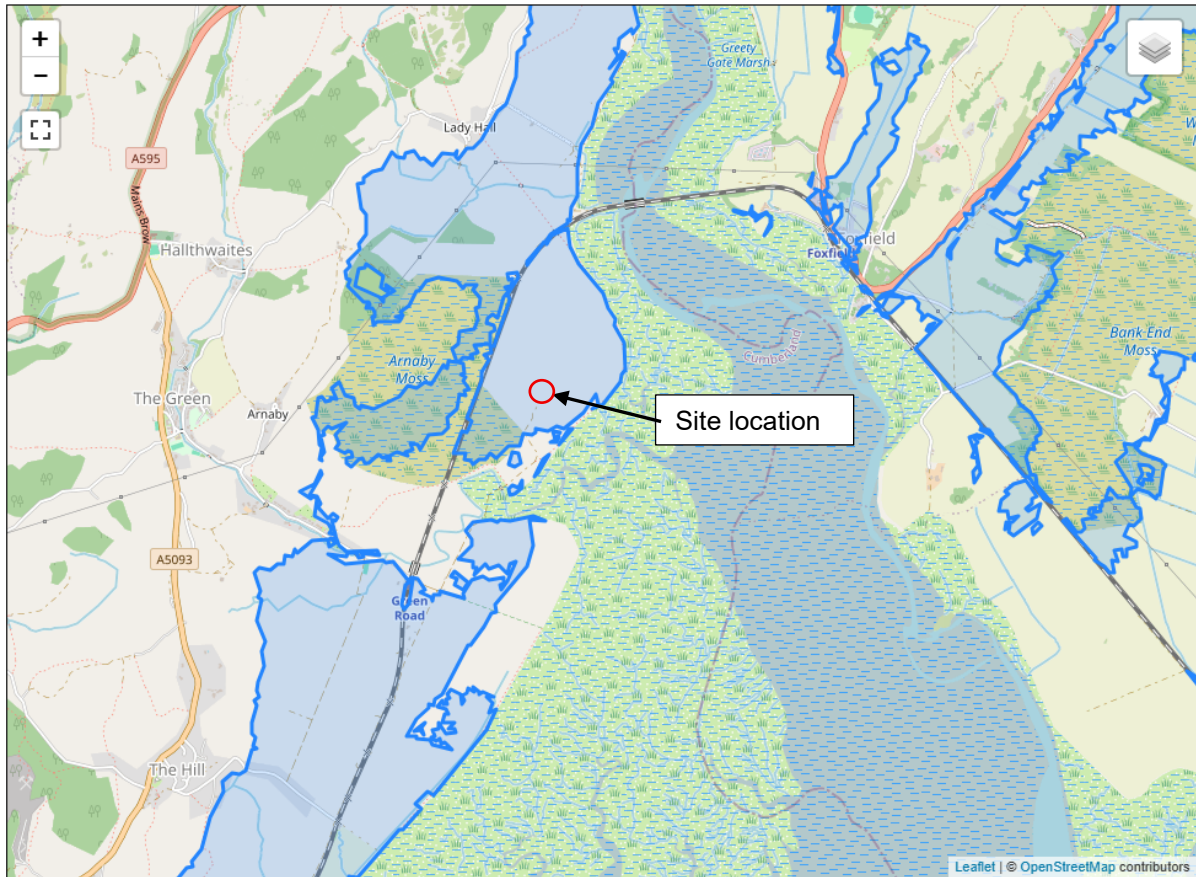
The table below shows the overall risk rating(s) that apply within this section of frontage. Overall risk is defined from the probability of conditions/behaviour occurring and the consequences the conditions/behaviour would have.

Duddon Estuary to Tarn Point Overall Risk Rating				
SMP Policy Unit (11c)	Section of Frontage	Probability Index	Consequence Index	Overall Risk Rating
16.8	Duddon Estuary (Both banks upstream of Viaduct and right bank south to Green Rd Station)	Low	Medium/High	Medium
16.9	Millom Marshes	Low	Medium	Low
16.10	Red Hills (Industrial area)	Low	Medium	Low
16.11	Hodbarrow Mains	Low	Medium/Low	Low



APPENDIX E – Flood Warning Information

Flood Warning Area: Cumbrian coastline at Duddon estuary, between Haverigg, Duddon Bridge, Dunnerholme and A595



Flood Alert Area: Coast at Duddon estuary

