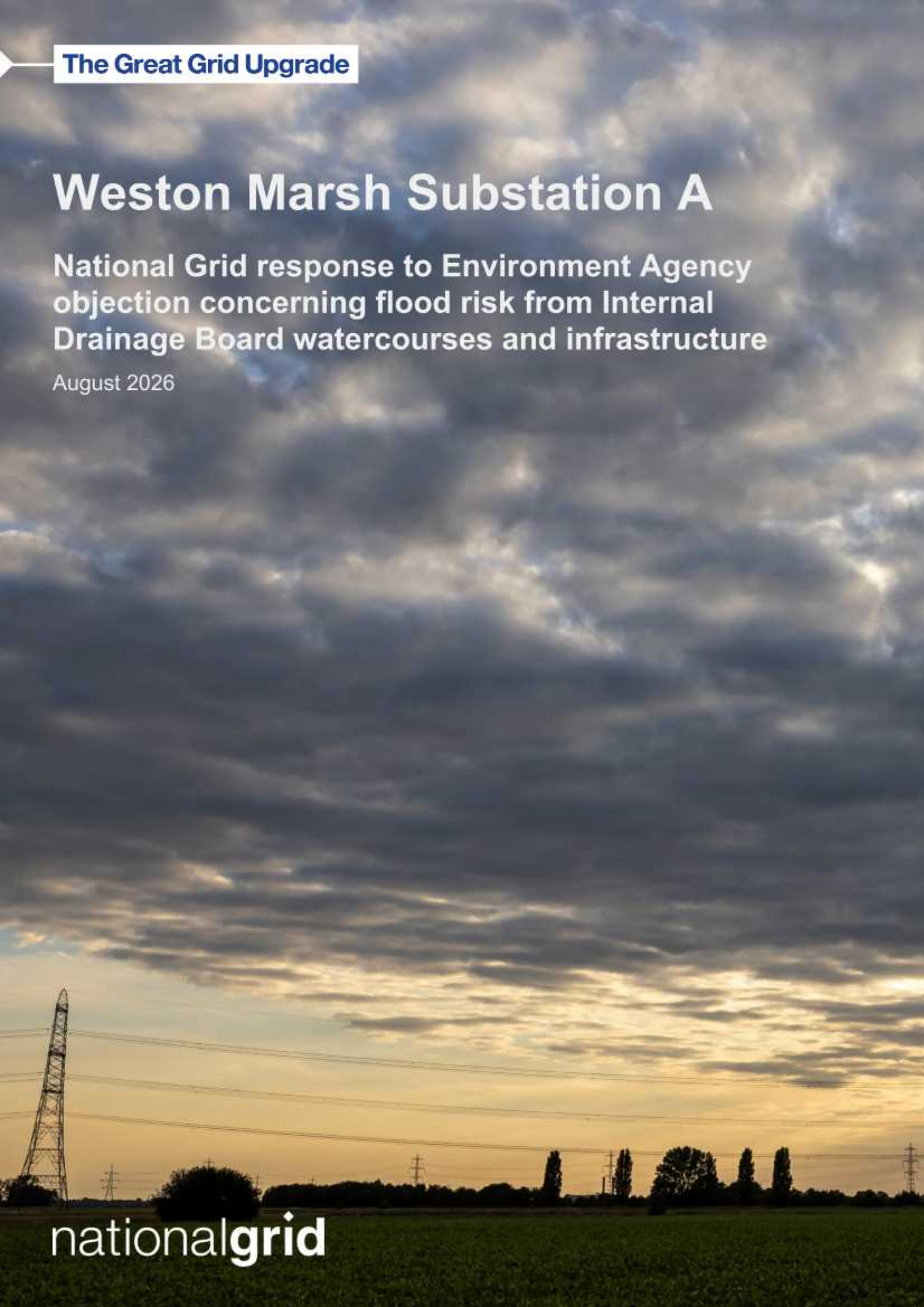
The Great Grid Upgrade

Weston Marsh Substation A

National Grid response to Environment Agency objection concerning flood risk from Internal Drainage Board watercourses and infrastructure

August 2026



nationalgrid

Weston Marsh Substation A
Document control

Document Properties	
Organisation	WSP UK Ltd
Approved by	National Grid
Title	Technical Note: Response to EA Objection
Document Register ID	GWNC-WSP-ZZZZ-ZZZZZZ-RPT-ES-000001
Data Classification	Public

Version History			
Document	**Version**	**Status**	**Description / Changes**
August 2026	1.0	Final	First Issue

Contents

1.	**Introduction**	**1**
1.1	Purpose of the Technical Note	1
1.2	Assumptions and Limitations	2
2.	**Consultation with South Holland Internal Drainage Board (IDB)**	**3**
2.2	Sluice and pumping station operating regime	3
2.3	Contingency and resilience	4
3.	**Hydraulic Modelling**	**5**
3.1	Background	5
3.2	Pump failure scenario	5
3.3	Channel capacity exceedance scenario	6
4.	**Summary**	**8**

Image 2.1	Site Location Plan (Extract from Figure 1 of the FRA)	3
Image 3.1	Lords Catchment Lords Catchment Storage Areas (Extract from Figure 5)	5
Image 3.2	Lords Catchment 1% AEP+2085 CC (Extract from Appendix B31)	7

	References	9

1. Introduction

1.1 Purpose of the Technical Note

1.1.1 On 16 June 2026 the Environment Agency (EA) issued an objection to the planning application for the Weston Marsh Substation A (planning reference H22-0466-26) with respect to the supporting Flood Risk Assessment (FRA) [document reference GWNC-WSP-SS50-XXXXXX-RPT-ES-000002]. The basis of the objection is as quoted below:

> *"The Flood Risk Assessment (FRA) does not comply with the requirements for addressing residual risk as set out in paragraphs 041,042 and 043 of the Planning Practice Guidance Flood Risk and Coastal Change 2025 which does not adequately assess the residual flood risk to the site in the event of failure or non-operation of Lord's Sluice / pumping station. It has therefore not been demonstrated that the development would be safe for its lifetime, or that appropriate mitigation and resilience measures are included within the design".*

1.1.2 To overcome the objection, the EA advised that:

> *"The applicant should provide a proportionate assessment of this failure scenario, including depths, velocities, hazard and duration at the site. This may require hydraulic modelling or other robust technical evidence. The applicant should then demonstrate that the development layout, finished floor levels, access and egress arrangements, and flood resistant and resilient design measures are appropriate for the level of residual risk identified"*

1.1.3 In addition, the EA acknowledged that:

> *"Predicted tidal breach water levels are likely to exceed any fluvial flood risk associated with these IDB drains, this assertion should be supported by proportionate technical evidence. For example, a simple assessment of channel capacity and associated water levels under an appropriate design event could be undertaken (e.g. using the Manning's equation).*
>
> *This should demonstrate how estimated flood levels within New Drain and Lords Drain compare with existing ground levels and proposed finished floor levels at the substation site to confirm that the fluvial risk to the site is negligible and that there are no impacts on flood risk elsewhere."*

1.1.4 WSP has produced this Technical Note on behalf of National Grid Electricity Transmission (National Grid) to address the EA's above concerns relating to residual risk associated with failure or non-operation of the Lords Drain sluice and pumping station, and risk of flooding associated with channel capacity exceedance of IDB watercourses.

1.2 Assumptions and Limitations

1.2.1 WSP has prepared this Technical Note in accordance with the instructions of their Client, National Grid, for their sole and specific use relating solely to the above site. Any person who uses any information contained herein does so at their own risk and shall hold WSP harmless in any event.

1.2.2 The assessment carried out in this Technical Note is informed by hydraulic modelling undertaken and supplied by a third party. Whilst this Technical Note was prepared using the reasonable skill and care ordinarily exercised by engineers practising under similar circumstances and reasonable checks have been made on third party data sources and the accuracy of the data, WSP accepts no liability in relation to the report should any third-party data, information or condition be incorrect or have been concealed, withheld, misrepresented, or otherwise not fully disclosed to WSP.

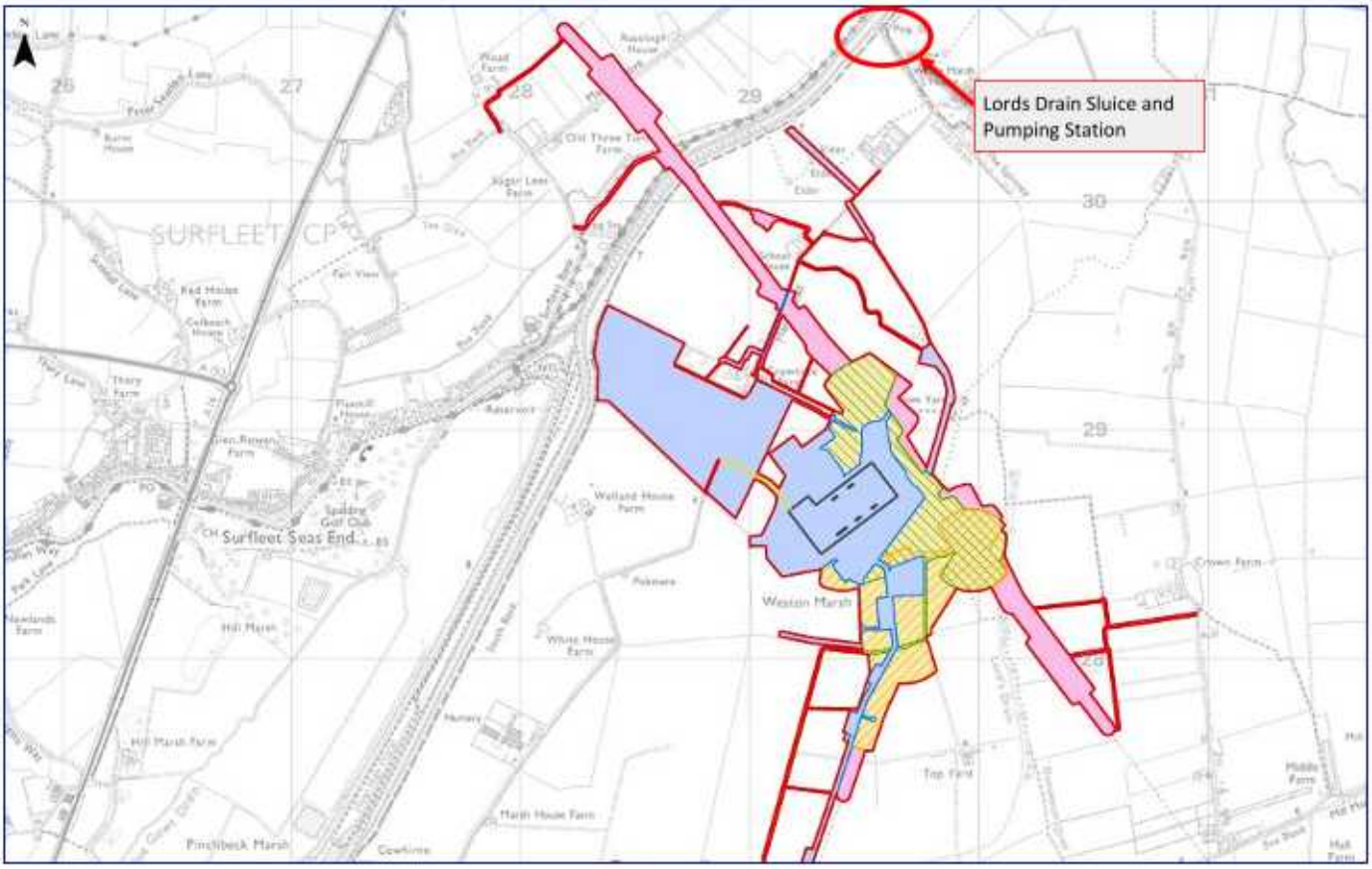
2. Consultation with South Holland Internal Drainage Board (IDB)

2.1.1 South Holland IDB were consulted in a meeting on 16 July 2026 to discuss the operating regime of the Lords Drain sluice and pumping station, contingency and resilience measures which are in place is case of pump failure, and the results from the IDB's own hydraulic modelling of the Lords Drain catchment.

2.2 Sluice and pumping station operating regime

2.2.1 Levels in the IDB managed watercourses in the vicinity of the proposed Weston Marsh Substation A are controlled by the Lords Drain sluice and pumping station, which conveys flow from the Lords Drain into the tidal reach of the River Welland, shown below (circled in red) in **Image 2.1**. The sluice and pumping station were first commissioned in 1963.

Image 2.1 Site Location Plan (Extract from Figure 1 of the FRA)



2.2.2 The IDB outlined that the Lords Drain catchment is a predominantly gravity-drained system and that typically 95% of discharge to the River Welland passes through the sluice under gravity. The pumps are only activated when water levels exceed the capacity of the gravity-draining system during very wet periods.

2.2.3 The sluice is tide locked twice daily but typically this does not, in itself, cause the pumps to be activated. The pumps were replaced in a refurbishment of the pumping station in 2023, but they retain the same capacity as before; two pumps with a pumping capacity of 1.42m^3/s per pump (total capacity 2.84 m^3/s).

2.3 Contingency and resilience

2.3.1 The IDB confirmed that there is no record of a pump failure at this station in over 60 years of operation, and that there are no known issues with flooding from the ditch network in the Lords Drain catchment. However, contingency and resilience measures are in place, as outlined below:

1) telemetry is in place to provide warning of pump failure;
2) a mobile standby generator is available to provide backup power to the pumping station; and
3) mobile pumps are available, albeit with a lower capacity than the permanent pumps.

2.3.2 The duration of a potential pump failure could be highly variable. The IDB stated that they are committed to resolving issues as quickly as is practicable, but the period for which pumps are non-operational depends in the nature of the fault and required remediation/repair. This could vary between hours and months if components are required to be replaced or repaired.

3. Hydraulic Modelling

3.1 Background

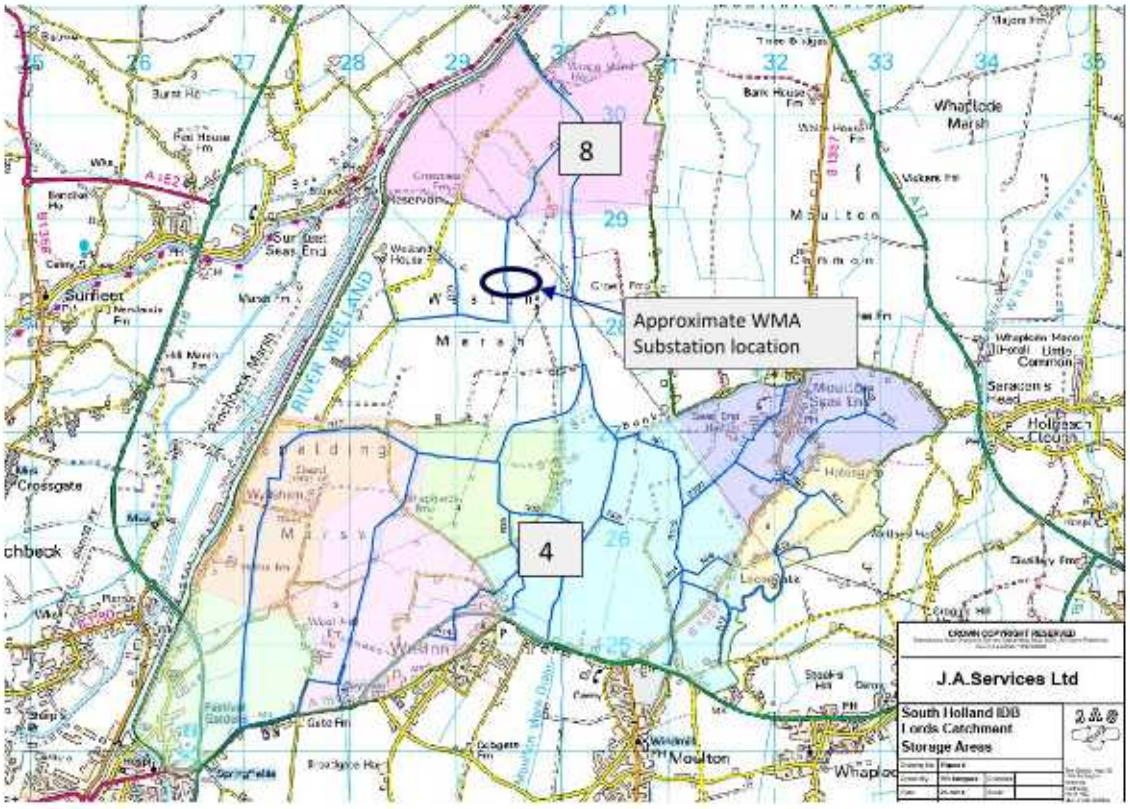
3.1.1 South Holland IBD supplied the model report (Lords Pumped Catchment Strategy Modelling Report Revision C) (Ref 1) and relevant model files of a 1D HEC-RAS model of the Lords Drain catchment on 15 July 2026. The model was produced in 2014 (updated 2017) and models a range of scenarios and return periods.

3.2 Pump failure scenario

3.2.1 The main focus of the 2017 modelling report was on assessing the capacity of the Lords Drain system under normal operating conditions. However, a pump failure scenario was modelled for the catchment, which simulated a single event and assumed normal antecedent conditions. The modelled pump failure scenario was modelled by changing the operating rules of the pumps in order that they never switch on.

3.2.2 The highest magnitude event modelled with pump failure was the 2014 0.5% AEP event. From a review of the model undertaken by WSP in August 2026 the predicted level in Storage Area 4 (upstream of the proposed substation) is 2.44m ODN. The predicted level in Storage Area 8 (downstream of the proposed substation) is 2.43m ODN. The Storage Areas and proposed substation location are shown below in **Image 3.1**, replicated from Figure 5 of (Ref 1).

Image 3.1 Lords Catchment Lords Catchment Storage Areas (Extract from Figure 5)



3.2.3 Existing ground levels at the location of the proposed substation are indicated to range between 3.75 m ODN to 5.12 m ODN, as shown in **Image 3.1** of the FRA prepared for the Planning Application. The proposed Weston Marsh Substation A will be placed on a raised platform at 4.42 m ODN. This demonstrates that there is a negligible risk of flooding to the proposed substation in a pump failure scenario based on the information provided in the modelling report.

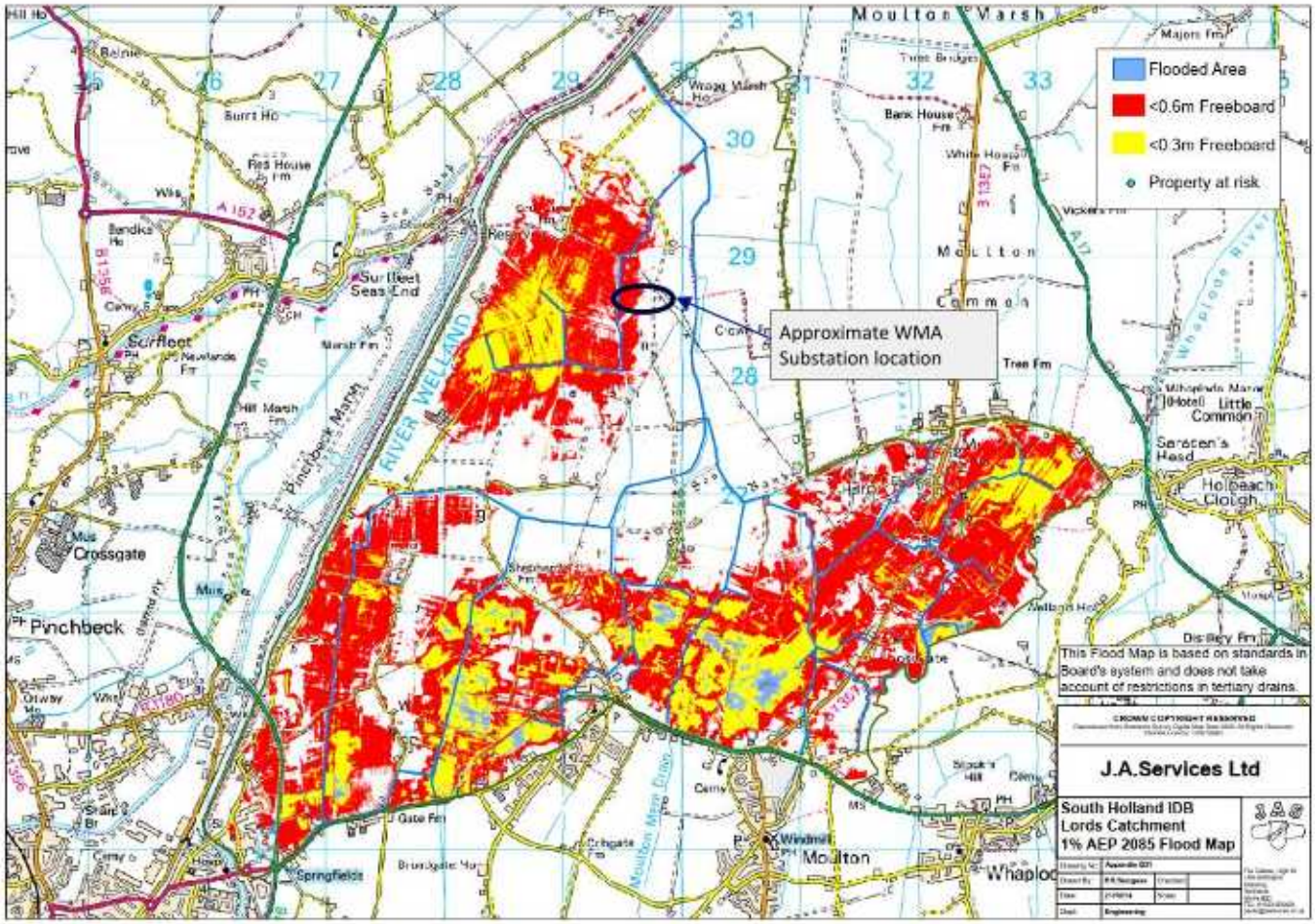
3.3 Channel capacity exceedance scenario

3.3.1 In addition to the pump failure scenario also simulated normal operating scenarios, including high magnitude events which could result in exceedance of channel capacity in the catchment, including the New Drain and Lords Drain, as referenced in the EA objection.

3.3.2 The 1% AEP+2085 climate change (CC) scenario includes a 20% increase in peak river flow, and predicts that the site of the proposed Weston Marsh Substation A is not at risk of flooding in this scenario, as shown in **Image 3.2**, which is an extract of Appendix B31 of (Ref 1) of the modelling report with the proposed Weston Marsh Substation A location circled. Areas with <0.6m freeboard are shown in red and areas with <0.3m freeboard are shown in yellow. This refers to the IDB target to retain 0.6m freeboard between water level and the top of bank, and indicates where these freeboard targets are not met, according to the modelling. It can be seen that the proposed Weston Marsh Substation A will be located in an area with <0.6m freeboard relative to the modelled flood level. The model review undertaken by WSP identified that a maximum water level of 2.25m ODN is predicted in Storage Area 4, upstream of the proposed substation, and a maximum level of 1.93m ODN is predicted in Storage Area 8 downstream of the proposed substation, which are both significantly lower than the existing ground levels at the proposed substation which vary between 3.75 to 5.12m ODN.

3.3.3 Furthermore, as noted above the Weston Marsh Substation A will be located on a raised platform, which will provide additional assurance that it will not be subject to flooding from the IDB drainage network. Similarly, the mapping presented in **Image 3.2** also indicates that the proposed Weston Marsh Substation A site and surrounding land is not in a flooded area in this event indicating that safe access and egress will be available.

Image 3.2 Lords Catchment 1% AEP+2085 CC (Extract from Appendix B31)



4. Summary

4.1.1 This Technical Note has been produced to address EA concerns regarding flood risk to the proposed Weston Marsh Substation A from both failure/non-operation of the Lords Drain sluice and pumping station, and from channel capacity exceedance of IDB maintained watercourses in the Lords Drain catchment.

4.1.2 The operational regime established through consultation with South Holland IDB has been outlined. Typically 95% of flow is conveyed via the gravity sluice system, demonstrating that the drainage system is not routinely dependent upon pumping for its operation. The contingency and resilience measures in place have also been outlined, which demonstrate that in the event of a pump failure scenario, measures will be put in place to reinstate the pumped system as quickly as is practicable.

4.1.3 South Holland IDB stated that no pump failures have occurred in more than 60 years of operation at the Lords Drain sluice and pumping station, and furthermore that they have no records of flooding issues in the Lords Drain catchment.

4.1.4 Hydraulic modelling carried out by a third party on behalf of the IDB predicts that in a 0.5% AEP event plus a pump failure scenario, water levels upstream and downstream of the proposed substation are predicted to vary between 2.44 and 2.43m ODN. Existing ground levels at the site of the proposed substation are between 3.75 m ODN and 5.12 m ODN. Furthermore, the proposed Weston Marsh Substation A will be placed on a raised platform set at a minimum elevation of 4.42 m ODN. This demonstrates that the proposed Weston Marsh Substation A will not be at risk of flooding associated with failure or non-operation of the Lords Drain sluice and pumping station.

4.1.5 The IDB's hydraulic modelling also predicts that the site of the proposed Weston Marsh Substation A is not predicted to flood in the 1% AEP+2085 CC event, addressing the EA's concern regarding flood risk to the site associated with exceedance of the channel capacity in IDB watercourses such as the New Drain and Lords Drain.

References

Ref 1 South Holland Internal Drainage Board Lords Pumped Catchment Strategy Study Modelling Report, Revision C [2017]

National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com