AtkinsRéalis

Appendix 10-2 – Flood Risk Assessment

Uisce Éireann
October 2026

BALLINA AND LOUGH TALT WATER SUPPLY UPGRADE

Notice

This document and its contents have been prepared and are intended solely as information for Uisce Éireann and use in relation to Ballina and Lough Talt Water Supply Upgrade.

AtkinsRéalis Ireland Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 97 pages including the cover.

Document history

Document title: Flood Risk Assessment

Document reference:

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
0	DRAFT	PS	-	GH	TM	23/03/2026
1	First Issue	PS	ABM / AM	GH	TM	04/09/2026
2	Final Issue	PS	ABM / AM	GH	TM	05/09/2026

Client signoff

Client	Uisce Éireann
Project	BALLINA AND LOUGH TALT WATER SUPPLY UPGRADE
Job number	100089328

Contents

1. Introduction and Project Background 1

1.1 Relevant Guidance 4

1.2 Flood Risk 4

1.3 Causes of Flooding 5

1.4 Floodplains 5

1.5 Assessing Flood Risk 5

2. Stage 1 Flood Risk Assessment 7

2.1 Wherrew Raw Water Intake and Pumping Station 7
2.1.1 Topography 7
2.1.2 Local Hydrology & Existing Drainage 8
2.1.3 Geological Survey of Ireland Mapping 9
2.1.4 Flood Risk Identification of the Site 10
2.1.5 Flood Risk Investigation 11
2.1.6 Historical Maps 14
2.1.7 Mayo County Development Plan 2022-2028 15
2.1.8 Conclusion 16

2.2 Lisglennon Raw Water Storage and Pumping Station (RWS&PS) Upgrade 16
2.2.1 Topography 17
2.2.2 Local Hydrology & Existing Drainage 17
2.2.3 Geological Survey of Ireland Mapping 18
2.2.4 Flood Risk Identification of the Site 19
2.2.5 Flood Risk Investigation 20
2.2.6 Historical Maps 22
2.2.7 Mayo County Development Plan 2022-2028 23
2.2.8 Conclusion 24
2.2.9 Recommendations 24

2.3 Lisglennon Water Treatment Plant (WTP) 24
2.3.1 Topography 25
2.3.2 Local Hydrology & Existing Drainage 26
2.3.3 Geological Survey of Ireland Mapping 27
2.3.4 Flood Risk Identification of the Site 28
2.3.5 Flood Risk Investigation 29
2.3.6 Historical Maps 31
2.3.7 Mayo County Development Plan 2022-2028 32
2.3.8 Conclusion 33
2.3.9 Recommendations 33

2.4 Bonniconlon Booster Pumping Station (BPS) 33
2.4.1 Topography 34

2.4.2 Local Hydrology & Existing Drainage 35
2.4.3 Geological Survey of Ireland Mapping 36
2.4.4 Flood Risk Identification of the Site 37
2.4.5 Flood Risk Investigation 38
2.4.6 Historical Maps 40
2.4.7 Mayo County Development Plan 2022-2028 41
2.4.8 Conclusion 42
2.4.9 Recommendation 42
2.5 Windy Gap Break Pressure Tank (BPT) 42
2.5.1 Topography 43
2.5.2 Local Hydrology & Existing Drainage 44
2.5.3 Geological Survey of Ireland Mapping 45
2.5.4 Flood Risk Identification of the Site 46
2.5.5 Flood Risk Investigation 47
2.5.6 Historical Maps 49
2.5.7 Mayo County Development Plan 2022-2028 50
2.5.8 Conclusion 51
2.5.9 Recommendation 51
2.6 Lough Talt WTP 51
2.6.1 Topography 52
2.6.2 Local Hydrology & Existing Drainage 52
2.6.3 Geological Survey of Ireland Mapping 53
2.6.4 Flood Risk Identification of the Site 54
2.6.5 Flood Risk Investigation 55
2.6.6 Historical Maps 58
2.6.7 Sligo County Development Plan 2024–2030 59
2.6.8 Conclusion 60
2.6.9 Recommendation 60
2.7 Pipeline Corridor (Pipelines A to E) 60
2.7.1 Topography 61
2.7.2 Local Hydrology & Existing Drainage 62
2.7.3 Geological Survey of Ireland Mapping 63
2.7.4 Flood Risk Identification of the Site 64
2.7.5 Flood Risk Investigation 65
2.7.6 Historical Maps 68
2.7.7 Mayo and Sligo County Development Plan Policy Compliance 69
2.7.8 Conclusion 70
2.7.9 Recommendation 70
2.8 Bonniconlon Reservoir 71
2.8.1 Topography 71
2.8.2 Local Hydrology & Existing Drainage 72
2.8.3 Geological Survey of Ireland Mapping 73

2.8.4 Flood Risk Identification of the Site 74
2.8.5 Flood Risk Investigation 75
2.8.6 Historical Maps 77
2.8.7 Mayo County Development Plan 2022-2028 78
2.8.8 Conclusion 79
2.8.9 Recommendation 79
3. Stage 2 Flood Risk Assessment 80
3.1 Wherrew RWI&PS Stage 2 Initial Flood Risk Assessment 80
3.1.1 Stage 2 Assessment and Sequential Approach 81
3.1.2 Conclusion 82
3.1.3 Recommendations 82
4. Appendices 83
Appendix A. Supporting Information 84

Tables

Table 1-1 – Flood Zones 5
Table 2-1 Possible Flooding Mechanisms – Wherrew RWI&PS 10
Table 2-2 Possible Flooding Mechanisms - Lisglennon RWS&PS 19
Table 2-3 Possible Flooding Mechanisms – Lisglennon WTP 28
Table 2-4 Possible Flooding Mechanisms – Bonniconlon BPS 37
Table 2-5 Possible Flooding Mechanisms – Windy Gap BPT 46
Table 2-6 Possible Flooding Mechanisms – Lough Talt WTP 54
Table 2-7 Possible Flooding Mechanisms – Pipeline Corridor 64
Table 2-8 Possible Flooding Mechanisms – Bonniconlon Reservoir. 74

Figures

Figure 1-1 – Overview of the Proposed Development 2
Figure 1-2 – Source Pathway Receptor Model 4
Figure 2-1 – Site Location – Wherrew RWI&PS 7
Figure 2-2 – Local Topography – Wherrew RWI&PS 8

Figure 2-3 – Hydrological Features Map – Wherrew RWI&PS 9
Figure 2-4 – GSI Bedrock Geology Map – Wherrew RWI&PS 10
Figure 2-5 – Fluvial Flooding extents – Wherrew RWI&PS 12
Figure 2-6 – Coastal/Tidal Flooding extents – Wherrew RWI&PS 13
Figure 2-7 – Groundwater flooding extents – Wherrew RWI&PS 14
Figure 2-8 – OSI 6-inch Map – Wherrew RWI&PS 15
Figure 2-9 – OSI 25-inch Map – Wherrew RWI&PS 15
Figure 2-10 – Site Location – Lisglennon RWS&PS 16
Figure 2-11 – Local Topography – Lisglennon RWS&PS 17
Figure 2-12 – Hydrological Features Map – Lisglennon RWS&PS 18
Figure 2-13 – GSI Bedrock Geology Map – Lisglennon RWS&PS 19
Figure 2-14 – Fluvial Flooding extents – Lisglennon RWS&PS 20
Figure 2-15 – Coastal / Tidal Flooding extents – Lisglennon RWS&PS 21
Figure 2-16 – Groundwater Flooding Extents – Lisglennon RWS&PS 22
Figure 2-17 – OSI 6-inch Map – Lisglennon RWS&PS 23
Figure 2-18 – OSI 25-inch Map – Lisglennon RWS&PS 23
Figure 2-19 – Site Location – Lisglennon WTP 25
Figure 2-20 – Local Topography – Lisglennon WTP 26
Figure 2-21 – Hydrological Features Map – Lisglennon WTP 27
Figure 2-22 – GSI Bedrock Geology Map – Lisglennon WTP 28
Figure 2-23 – Fluvial Flooding extents – Lisglennon WTP 29
Figure 2-24 – Coastal / Tidal Flooding extents – Lisglennon WTP 30
Figure 2-25 – Groundwater Flooding extents – Lisglennon WTP 31
Figure 2-26 – OSI 6-inch Map – Lisglennon WTP 32
Figure 2-27 – OSI 25-inch Map – Lisglennon WTP 32

Figure 2-28 – Site location – Bonniconlon BPS 34
Figure 2-29 – Local Topography- Bonniconlon BPS 35
Figure 2-30 – Hydrological Features Map – Bonniconlon BPS 36
Figure 2-31 – GSI Bedrock Geology Map – Bonniconlon BPS 37
Figure 2-32 – Fluvial Flooding extents – Bonniconlon BPS 38
Figure 2-33 – Coastal / Tidal Flooding extents – Bonniconlon BPS 39
Figure 2-34 – Groundwater Flooding extents – Bonniconlon BPS 40
Figure 2-35 – OSI 6-inch Map – Bonniconlon BPS 41
Figure 2-36 – OSI 25-inch Map – Bonniconlon BPS 41
Figure 2-37 – Site Location – Windy Gap BPT 43
Figure 2-38 – Local Topography – Windy Gap BPT 44
Figure 2-39 – Hydrological Features Map – Windy Gap BPT 45
Figure 2-40 – GSI Bedrock Geology Map – Windy Gap BPT 46
Figure 2-41 – Fluvial flooding extents – Windy Gap BPT 47
Figure 2-42 – Coastal / Tidal flooding extents – Windy Gap BPT 48
Figure 2-43 – Groundwater flooding extents – Windy Gap BPT 49
Figure 2-44 – OSI 6-inch Map – Windy Gap BPT 50
Figure 2-45 – OSI 25-inch Map – Windy Gap BPT 50
Figure 2-46 – Site Location – Lough Talt WTP 51
Figure 2-47 – Local Topography – Lough Talt WTP 52
Figure 2-48 – Hydrological Features Map – Lough Talt WTP 53
Figure 2-49 – GSI Bedrock Geology Map – Lough Talt WTP 54
Figure 2-50 – Fluvial Flooding extents – Lough Talt WTP 56
Figure 2-51 – Coastal / Tidal Flooding Extents – Lough Talt WTP 57
Figure 2-52 – Groundwater Flooding Extents – Lough Talt WTP 58

Figure 2-53 – OSI 6-inch Map Lough Talt WTP 59

Figure 2-54 – OSI 25-inch Map Lough Talt WTP 59

Figure 2-55 – Site Location – Pipeline Corridor 61

Figure 2-56 – Local Topography – Pipeline Corridor 62

Figure 2-57 – Hydrological Features Map — Pipeline Corridor 63

Figure 2-58 – GSI Bedrock Geology Map – Pipeline Corridor 64

Figure 2-59 – Fluvial Flooding extents – Pipeline Corridor 66

Figure 2-60 – Flood level at Creggs Road 66

Figure 2-61 – Costal / Tidal Flooding extents – Pipeline Corridor 67

Figure 2-62 – Groundwater flooding extents – Pipeline Corridor 68

Figure 2-63 – OSI 6-inch Map – Pipeline Corridor 69

Figure 2-64 – Site Location – Bonniconlon Reservoir 71

Figure 2-65 – Local Topography – Bonniconlon Reservoir 72

Figure 2-66 – Hydrological Features Map – Bonniconlon Reservoir 73

Figure 2-67 – GSI Bedrock Geology Map – Bonniconlon Reservoir 74

Figure 2-68 – Fluvial Flooding extents – Bonniconlon Reservoir 75

Figure 2-69 – Coastal / Tidal Flooding Extents – Bonniconlon Reservoir 76

Figure 2-70 – Groundwater flooding extents – Bonniconlon Reservoir 77

Figure 2-71 – OSI 6-inch Map – Bonniconlon Reservoir 78

Figure 2-72 – OSI 25-inch Map – Bonniconlon Reservoir 78

Figure 3-1 – CFRAM Modelled Flood Depths for the 1% AEP (100-year) Fluvial Event under the Present Day Scenario 81

Figure 4-1 – Sligo County Development Plan 2024-2030: OPW CFRAM & NFIM High-End Future Scenario 85

Figure 4-2 – Sligo County Development Plan 2024-2030: OPW CFRAM & NFIM Present Day Scenario 86

Figure 4-3 – Western CFRAM Study – River Moy (floodmap.ie / NIFM mapping Ballina and Environs Tile 2) 87

1. Introduction and Project Background

AtkinsRéalis (AR) have been appointed by Uisce Éireann to prepare a Flood Risk Assessment (FRA) for the Ballina and Lough Talt Water Supply Upgrade (the 'Proposed Development'), a project designed to secure long-term, resilient water supply for north County Mayo and south County Sligo.

The Proposed Development comprises both existing and new infrastructure, as well as above ground and below ground elements. The Proposed Development will consist of seven "key locations" and five discrete sections of pipeline, as follows:

- Upgrade to the existing **Wherrew Raw Water Intake & Pumping Station (RWI&PS)**, Wherrew, Ballina, Co. Mayo;
- Upgrade to the existing **Lisglennon Raw Water Storage and Pumping Station (RWS&PS)**, Lisglennon, Ballina, Co. Mayo;
- Proposed **Pipeline A** – Lisglennon Raw Water Pumping Station to Lisglennon Water Treatment Plant (WTP);
- Upgrade to the existing **Lisglennon WTP**, Lisglennon, Ballina, Co. Mayo;
- **Proposed Pipeline B** – Lisglennon WTP to Existing River Moy Crossing;
- **Proposed Pipeline C** – Existing River Moy Crossing to Bonniconlon Booster Pumping Station (BPS);
- **Proposed Pipeline D** – Bonniconlon BPS to Windy Gap Break Pressure Tank (BPT);
- **Proposed Pipeline E** – Windy Gap BPT to Lough Talt WTP;
- Proposed **Bonniconlon BPS** located at Bonniconlon, Ballina, Co. Mayo;
- Proposed **Windy Gap BPT** located at the Windy Gap, Ballina, Co. Mayo;
- Repurposing the existing **Lough Talt WTP**, Co. Sligo;
- Proposed Treated Water Reservoir at the existing **Bonniconlon Reservoir** site, Ballina, Co. Mayo.

Figure 1-1 provides an overview of the Proposed Development.

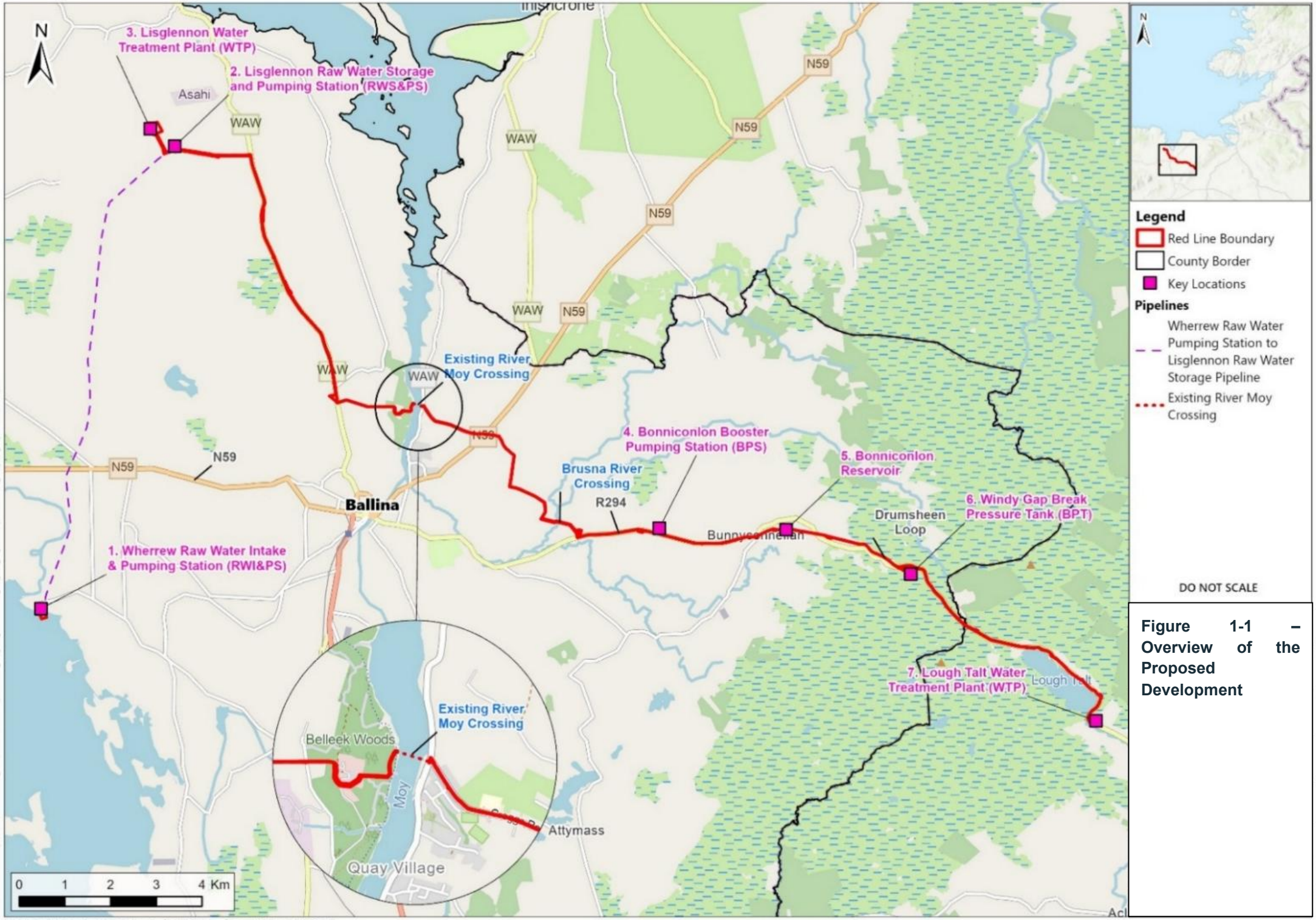


Figure 1-1 – Overview of the Proposed Development

This Flood Risk Assessment is structured to provide an integrated review of the Proposed Development, followed by a systematic assessment of flood risk for the seven key sites and pipeline corridor.

The initial chapters set out the project context, objectives, and general description of the scheme. The main body of the report is divided into site-specific chapters, each presenting a detailed assessment of flood risk, including site description, topography, hydrology, flood mechanisms, county planning policy review, and clear conclusions and recommendations.

This report should be read in conjunction with the Chapter 3 Project Description (EIAR Volume 2).

1.1 Relevant Guidance

This Flood Risk Assessment (FRA) has been undertaken in consideration with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG November 2009, which is the latest guidance document. The guidance has been issued to ensure that flood risk is a key consideration for developers, planning & regional authorities, and the public in preparing and submitting development proposals. All relevant flood risk guidance documents and data sources have been consulted, including the Office of Public Works (OPW) flood mapping resources and the local authority's flood risk management plans. The principles of the guidance are as follows:

- Avoid the risk, where possible
- Substitute less vulnerable uses, where avoidance is not possible, and
- Mitigate and manage the risk, where avoidance and substitution are not possible.

A staged approach is recommended within the guidance document in relation to identifying and assessing flood risk. The three stages of appraisal and assessment are as follows:

- **Stage 1 Flood risk identification** - screening for potential flood risk using existing information;
- **Stage 2 Initial flood risk assessment**- quantifying the nature and extent of any identified risk;
- **Stage 3 Detailed flood risk assessment**- site-specific analysis and mitigation design as necessary.

1.2 Flood Risk

Flood risk is assessed by evaluating the probability of a flood event occurring and the potential consequences of that event. Probability is typically expressed in terms of the annual exceedance probability (AEP) or return period, indicating the likelihood of flooding within a given year. The consequences of flooding depend on the severity of the flood hazard and the vulnerability of the affected area, including its land use, infrastructure, and population. The assessment of flood risk requires an understanding of the sources, the flow path of floodwater and the people and property that can be affected. The source - pathway - receptor model, shown below in Figure 1-2, illustrates this and is a widely used environmental model to assess and inform the management of risk.

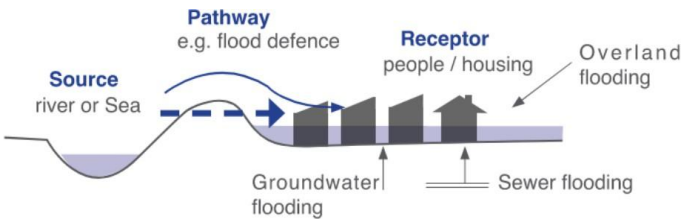


Figure 1-2 – Source Pathway Receptor Model

A structured approach to flood risk assessment is the Source-Pathway-Receptor model, which identifies the key components contributing to flood risk. The source represents the hazard capable of causing flooding, such as extreme rainfall, storm surges, or high river levels. The pathway is the mechanism through which the floodwaters reach vulnerable

areas, including inadequate drainage, overtopping of flood defences, or groundwater emergence. Finally, the receptor refers to the elements at risk, such as people, infrastructure, and property, which may suffer damage or disruption due to flooding. Understanding these interactions helps in designing effective flood mitigation and adaptation strategies.

1.3 Causes of Flooding

The Planning System and Flood Risk Management Guidelines requires an FRA to consider all potential causes of flooding including the following:

- Coastal flooding
- Inland flooding:
    - Overland flow
    - River flooding
    - Flooding from artificial drainage systems
    - Groundwater flooding
    - Estuarial flooding
- Failure of infrastructure

1.4 Floodplains

A floodplain is a low-lying area adjacent to a river, stream, or lake that is periodically inundated when water levels exceed channel capacity. Floodplains provide a natural storage function, temporarily holding excess water and reducing downstream flood risk. While floodplains are environmentally valuable, development within them is generally discouraged due to the increased flood hazard and the potential loss of storage. In lakeshore settings like Wherrew, the floodplain is the area adjoining the normal lake margin that may be submerged during high lake levels. The planning system recognises the critical role of floodplains in flood risk management and seeks to protect their function through appropriate zoning and development control.

1.5 Assessing Flood Risk

In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' three flood zones are designated in the consideration of flood risk to a particular site. The three flood zones are described in Table 1-1 below.

Table 1-1 – Flood Zones

Flood Zone	Description
Flood 'Zone A'	Where the probability of flooding from watercourses is the highest (greater than 1% or 1 in 100-year for watercourse flooding or 0.5% or 1 in 200 for coastal flooding).

Flood Zone	Description
Flood ‘Zone B’	Where the probability of flooding from watercourses is moderate (between 0.1% or 1 in 1000 year and 1% or 1 in 100-year for watercourse flooding, and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding).
Flood ‘Zone C’	Where the probability of flooding from watercourses and the sea is low or negligible (less than 0.1% or 1 in 1000-year for both watercourse and coastal flooding). Flood Zone ‘C’ covers all areas which are not in Zones ‘A’ or ‘B’.

The planning implications for each of the flood zones are:

- **Zone A –** High probability of flooding. Most types of development would be considered inappropriate in this zone. Development in this zone should be avoided and/or only considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation, would be considered appropriate in this zone.

- **Zone B –** Moderate probability of flooding. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development, such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development might be considered appropriate in this zone. In general, however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will adequately be managed.

- **Zone C -** Low probability of flooding. Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

2. Stage 1 Flood Risk Assessment

2.1 Wherrew Raw Water Intake and Pumping Station

The Wherrew Raw Water Intake and Pumping Station (RWI&PS) site is located on the northeastern shoreline of Lough Conn, approximately 6 km southwest of Crossmolina and 10 km northwest of Ballina, within County Mayo.



Figure 2-1 – Site Location – Wherrew RWI&PS

2.1.1 Topography

The topography at Wherrew RWI&PS site is defined by the interplay between the extensive lowland expanse of Lough Conn and the undulating rural hinterland that rises northwards and westwards away from the lake (Figure 2-1). According to detailed digital elevation models (DEM) and topographic survey data, site elevations range from approximately 7 metres above Ordnance Datum (OD) at the lakeshore and intake, to around 18 metres OD at the upper edge of the site, near the internal access road. There is slope from the access road down to the lake providing natural drainage and minimising the risk of pluvial (surface water) accumulation.

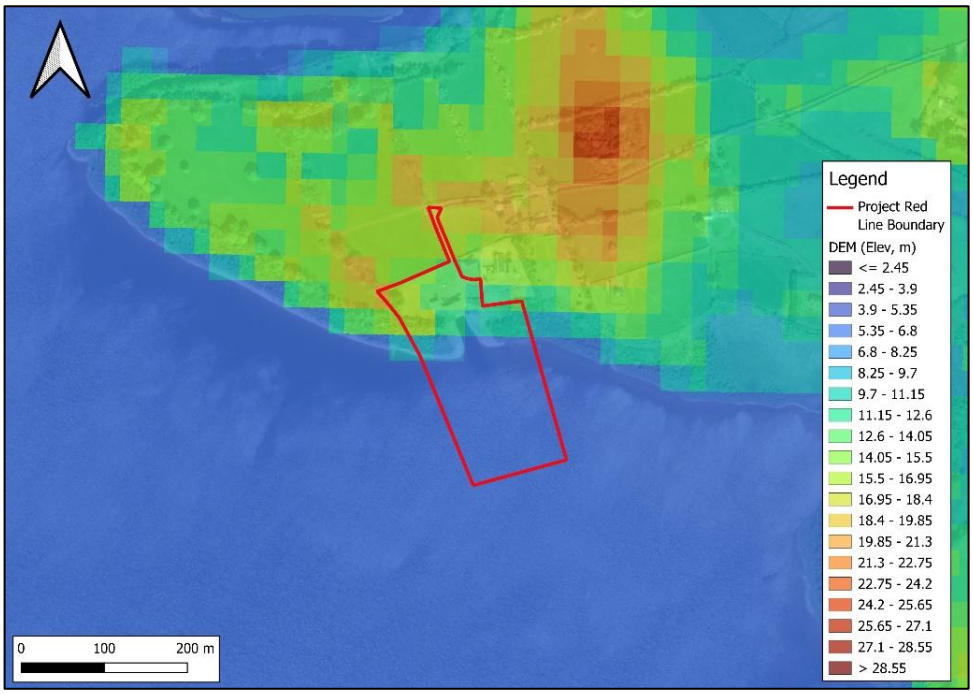


Figure 2-2 – Local Topography – Wherrew RWI&PS

2.1.2 Local Hydrology & Existing Drainage

The Wherrew Raw Water Intake & Pumping Station (RWI&PS) is located on the shore of Lough Conn, close to the small settlement of Wherrew in County Mayo (Figure 2-3). The site is in immediate proximity to the lake, with the raw water intake infrastructure extending directly into the waterbody. The existing pumping station building is set back from the lake edge on gently sloping ground, at an elevation ranging from approximately 11 to 18 metres OD. Hydrologically, the site is dominated by the presence of Lough Conn, a large, lowland freshwater lake forming the northern boundary of the site.

The hydrological regime of Lough Conn is characterised by:

- A large catchment area with gradual lake level response to rainfall events,
- Significant storage capacity, which buffers short-term fluctuations but can lead to prolonged periods of elevated water levels following sustained rainfall,
- Natural outlet via the River Moy, which flows northeast towards Ballina and ultimately to Killala Bay on the Atlantic coast.

The Wherrew RWI&PS is located within this stable, lowland lakeshore environment. There are no major river channels, distributary streams, or major artificial drains intersecting the site. The nearest minor watercourse is the Garrycloonagh Stream, which enters Lough Conn to the east of the site, but does not pass through or pose a flood risk to the RWPS. The lake is part of the Deel [Crossmolina] SC_020 subcatchment (approximately 1km) and receives drainage from surrounding minor streams and local runoff, as shown on the mapping. The lake is fed by multiple tributaries, including the River Deel, as well as minor streams and local surface water inflows from surrounding agricultural land.

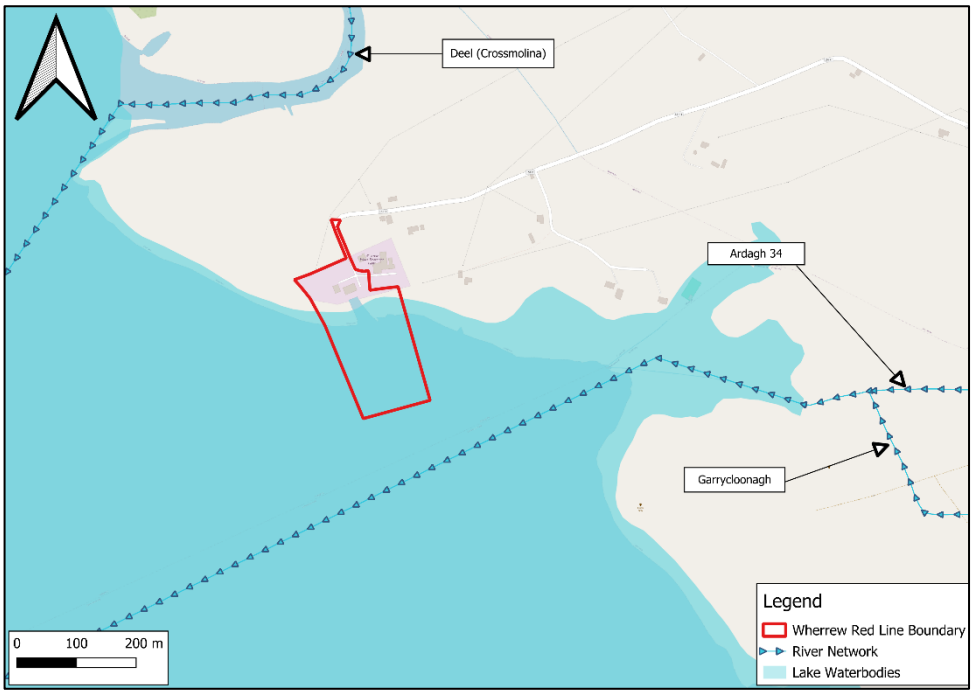


Figure 2-3 – Hydrological Features Map – Wherrew RWI&PS

2.1.3 Geological Survey of Ireland Mapping

The Wherrew RWI&PS is situated on the northern shore of Lough Conn, and is underlain by Till derived from limestones which overlies the Ballina Limestone formation (Upper) according to the Geological Survey of Ireland (GSI) bedrock geology (Figure 2-4). The site is located entirely within this limestone bedrock unit, which extends throughout the immediate area between the lakeshore and the local road network. The proximity to Lough Conn suggests that superficial deposits may include lake-derived silts, although these are not distinguished at the scale of the current mapping. Bedrock is not exposed at the surface on available imagery. The Ballina Limestone formation (Upper) is typically formed in shallow marine environments and are known for their moderate to high permeability due to the presence of bedding planes and occasional fracturing. These characteristics may support some degree of groundwater movement in the wider area.

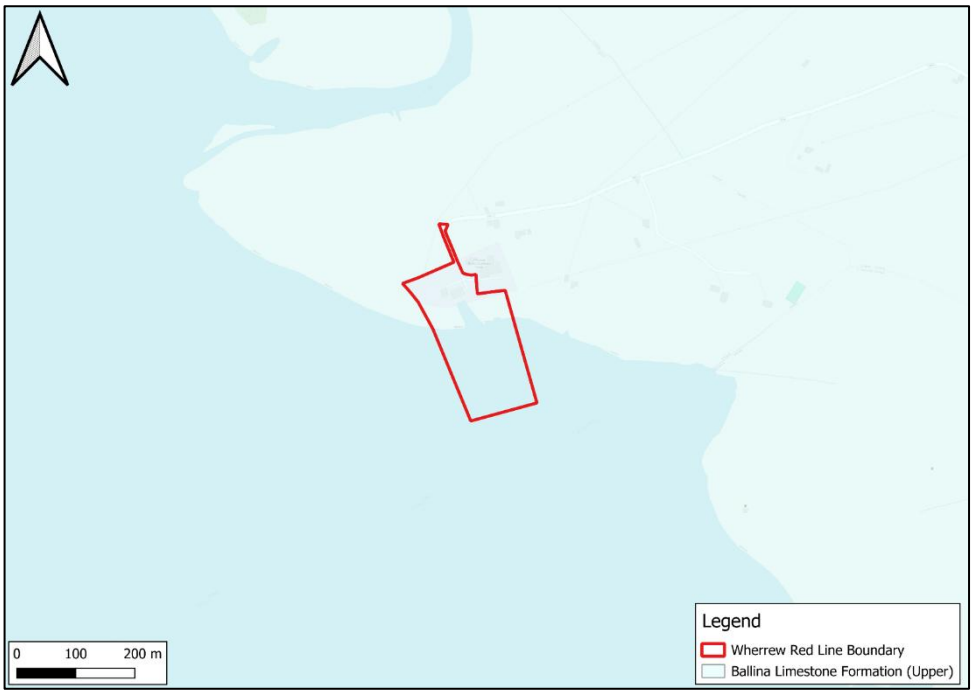


Figure 2-4 – GSI Bedrock Geology Map – Wherrew RWI&PS

2.1.4 Flood Risk Identification of the Site

In accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009), a Stage 1 Flood Risk Identification has been undertaken to establish whether any flooding or surface water management issues exist at the Wherrew Intake and Raw Water Pumping Station (RWI&PS).

Table 2-1 Possible Flooding Mechanisms – Wherrew RWI&PS

Source/Pathway	Significant?	Comment/Reason
Coastal flooding	No	Lough Conn is an inland freshwater lake, unaffected by tidal or coastal processes. No tidal influence at site.
Pluvial/Overland flow	No/Low	The site is gently sloping with direct drainage to local watercourses. No mapped pluvial risk, and no ponding or surface water issues observed.
Fluvial/River flooding	Yes	Proposed Intake structure and intake pipe lies within mapped Flood Zones A/B. Main compound is on elevated ground (Zone C).
Flooding from artificial drainage systems	No	There are no artificial or urban drainage systems on site. Minor field drains in adjacent agricultural land do not intersect the site.
Estuarial flooding	No	The site is far inland, with no tidal or estuarial flood influence
Failure of infrastructure	No	No upstream hydraulic structures (dams, reservoirs, canals) that could pose a structural flood risk.

2.1.5 Flood Risk Investigation

2.1.5.1 OPW Flood Maps

A preliminary flood risk assessment has been undertaken for the Wherrew RWI&PS, in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009). The assessment utilised both national and local flood mapping datasets, with particular emphasis on the OPW's CFRAM predictive flood extent layers (available at www.floodinfo.ie). For fluvial (river) flood risk, the CFRAM mapping for Flood Zone A (1% Annual Exceedance Probability [AEP], or 1-in-100-year) and Flood Zone B (0.1% AEP, or 1-in-1,000-year) were reviewed and overlaid on the site boundary.

Fluvial/River Flood Risk

A review of the fluvial (lake) flood risk at the Wherrew Raw Water Intake and Pumping Station (RWI&PS) has been undertaken using OPW's Catchment Flood Risk Assessment and Management (CFRAM) maps, National Indicative Fluvial Mapping (NFIM), and historic flood event record (Figure 2-5). The mapping provided for this assessment overlays the site boundary with all known flood risk zones for Lough Conn, including the 1% AEP (100-year) and 0.1% AEP (1,000-year) flood extents. The analysis indicates that the mapped floodplain associated with Lough Conn extends inland to cover the lower, shoreline portion of the site, specifically the intake works. However, the existing pumping station building compound, and the majority of the site are located on rising ground above the mapped flood extents. The OPW CFRAM/NFIM flood mapping indicates that the 1% AEP flood extent closely follows the lake's shoreline near Wherrew. In other words, areas immediately at the water's edge, including portions of the existing Wherrew intake works, proposed intake works and low-lying ground by the lake, lie within Flood Zone A (high probability of flooding) as defined by the guidelines (greater than 1% annual chance of fluvial flood). A review of the OPW's historic flood event database confirms that no flood incidents are recorded at or adjacent to the existing site; the nearest mapped event is located elsewhere on Lough Conn and does not correspond to the local shoreline or drainage pathways at Wherrew. There are no river channels, distributary streams, or field drains that connect the main compound with any fluvial flood source other than the immediate lake frontage. The combined CFRAM and NFIM analysis therefore confirms that a portion of the site (intake/shore) falls within Flood Zones A/B and is theoretically at risk from extreme lake flooding. A Stage 2 flood risk assessment is required for the specific elements within Flood zones A/B.

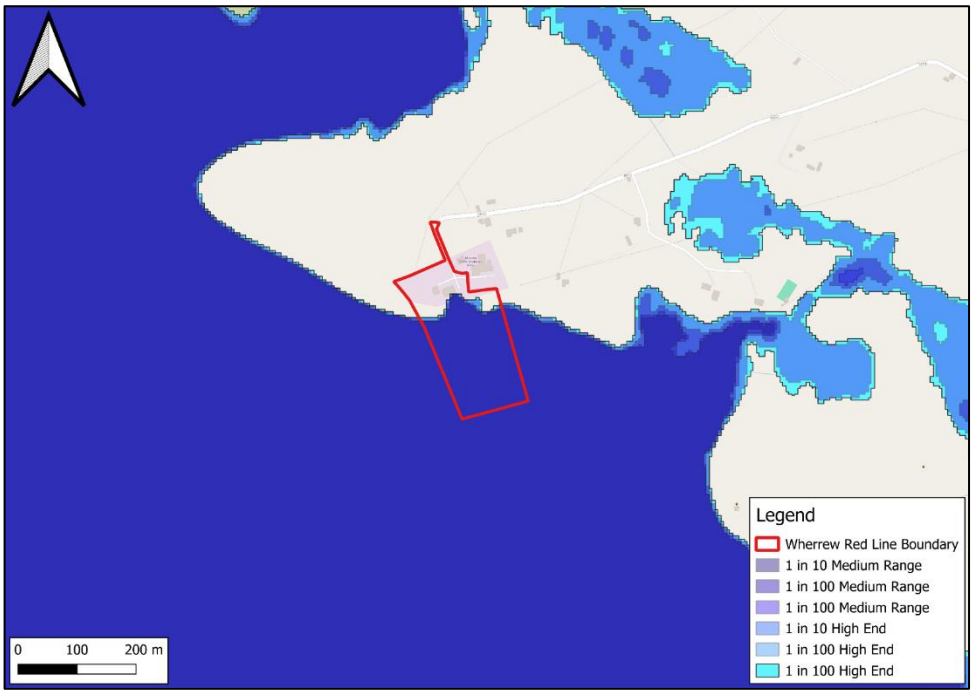


Figure 2-5 – Fluvial Flooding extents – Wherrew RWI&PS

Coastal/Tidal Flood Risk

A detailed review of the OPW CFRAM coastal flood mapping has also been undertaken for the Wherrew RWI&PS site (Figure 2-6), focusing on the 0.5% AEP (200-year) and 0.1% AEP (1,000-year) coastal flood extents. The CFRAM maps clearly show that Lough Conn is a freshwater lake and is not hydrologically or topographically connected to any estuarine, tidal, or marine system. The mapped coastal flood zones are restricted to the Atlantic coast and to tidal water bodies further downstream of the site. There is no intersection or proximity between the mapped tidal/coastal flood extents and the Wherrew RWI&PS site boundary. The site itself is set on the inland shore of Lough Conn, at an elevation well above any plausible marine influence, and there are no topographic depressions, channels, or connections that could enable coastal or estuarine water to reach the site under any present or future (climate change) scenario. It is therefore concluded, with reference to the CFRAM mapping and national guidance, that the Wherrew RWI&PS site is not at risk from coastal or tidal flooding. No further assessment for coastal flood risk is required at Stage 1.

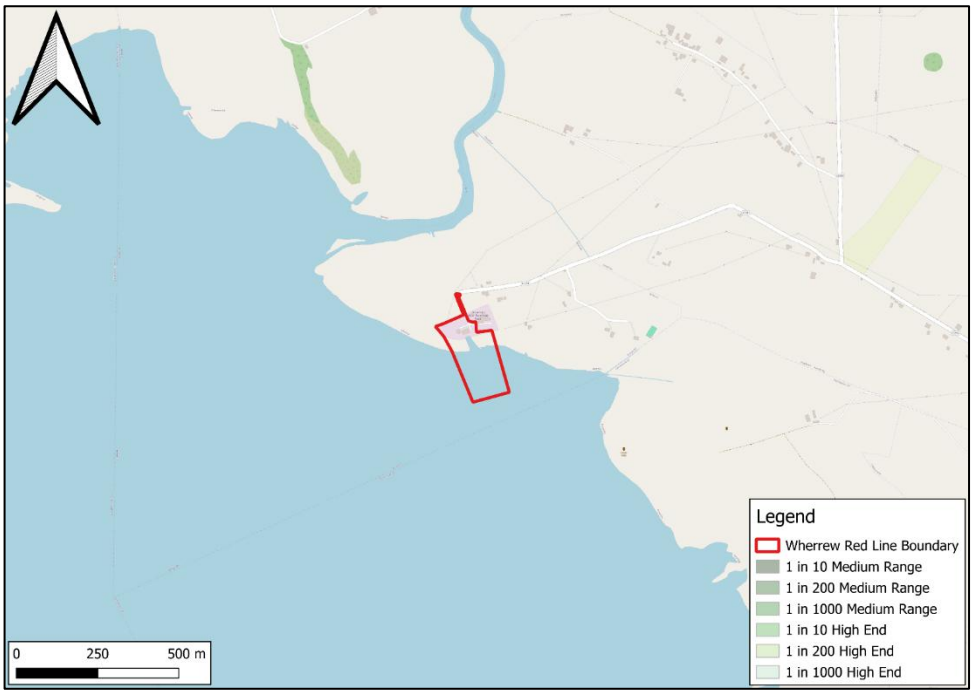


Figure 2-6 – Coastal/Tidal Flooding extents – Wherrew RWI&PS

Groundwater Flood Risk

A detailed review of groundwater flood risk at the Wherrew Raw Water Pumping Station (RWPS) site has been conducted using the Geological Survey Ireland (GSI) mapping, specifically the Maximum Historic Groundwater Flood dataset (GSI), Groundwater Flooding High Probability mapping, and the inventory of boreholes, springs, and karst landforms. The mapped extent of these flood zones and relevant groundwater features has been overlaid on the RWPS site and its wider catchment (Figure 2-7). The mapping shows that no part of the RWPS compound, intake, or associated access infrastructure is located within or adjacent to a mapped area of historic groundwater flooding or high-probability groundwater flood risk. The nearest mapped areas of potential groundwater flooding are situated several hundred metres southeast of the site and are topographically and hydrologically separated from the RWPS by intervening ground and the broad margin of Lough Conn itself. A review of GSI data confirms the absence of mapped turloughs, springs, or active karst features at or near the site. No boreholes, cave systems, or swallow holes are present within the RWPS boundary or its immediate environs. The local geology, as evidenced by the lack of mapped karst or groundwater flood indicators, is not conducive to significant groundwater emergence or ponding at the site. Further, there are no records of historic groundwater-related flood events at the site or within the Lough Conn lakeshore margin in this area. The surrounding landscape consists of gently sloping pasture and the open water of Lough Conn, with no topographic depressions or features likely to promote localised groundwater flooding.

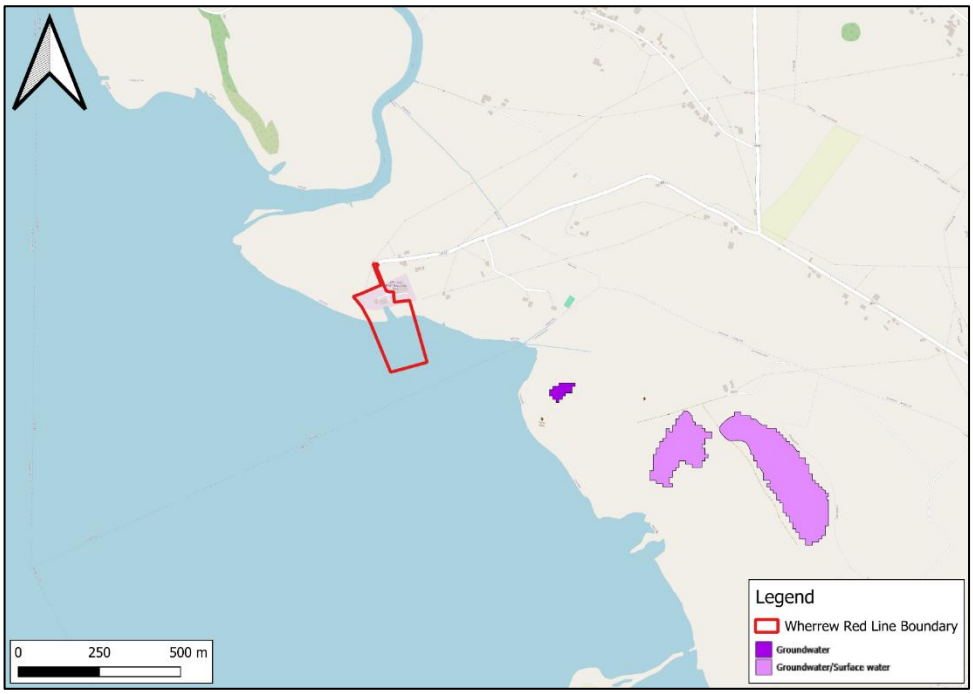


Figure 2-7 – Groundwater flooding extents – Wherrew RWI&PS

2.1.6 Historical Maps

Historic Ordnance Survey Ireland (OSI) maps were reviewed via the ArcGIS web viewer (https://www.arcgis.com/apps/webappviewer/) to identify any historic evidence of flooding or hydrologically sensitive land within the Wherrew RWI&PS site. Overlay of the site boundary on both the six-inch and twenty-five-inch historic maps (Figure 2-8 and Figure 2-9) shows that the land has consistently been in agricultural or pasture use, with no indication of historic watercourses, marshy areas, or flood-prone features within the site footprint. The mapped shoreline and surrounding terrain remain unchanged and free from any annotation of historic flood events or drainage concerns. This analysis supports the conclusion that the site is not historically subject to fluvial, coastal, or groundwater flooding.

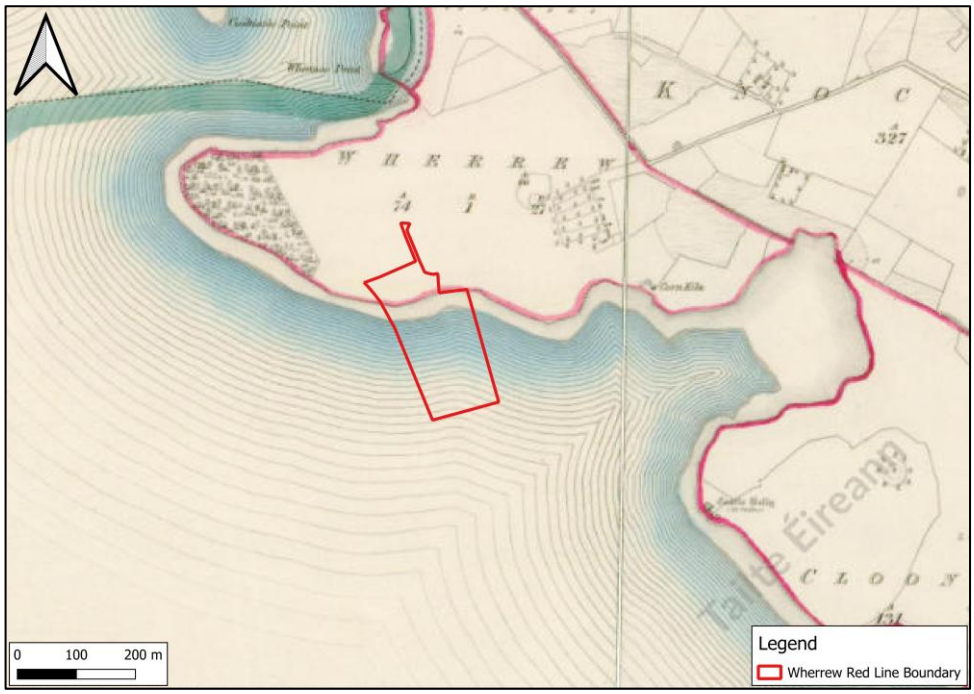


Figure 2-8 – OSI 6-inch Map – Wherrew RWI&PS

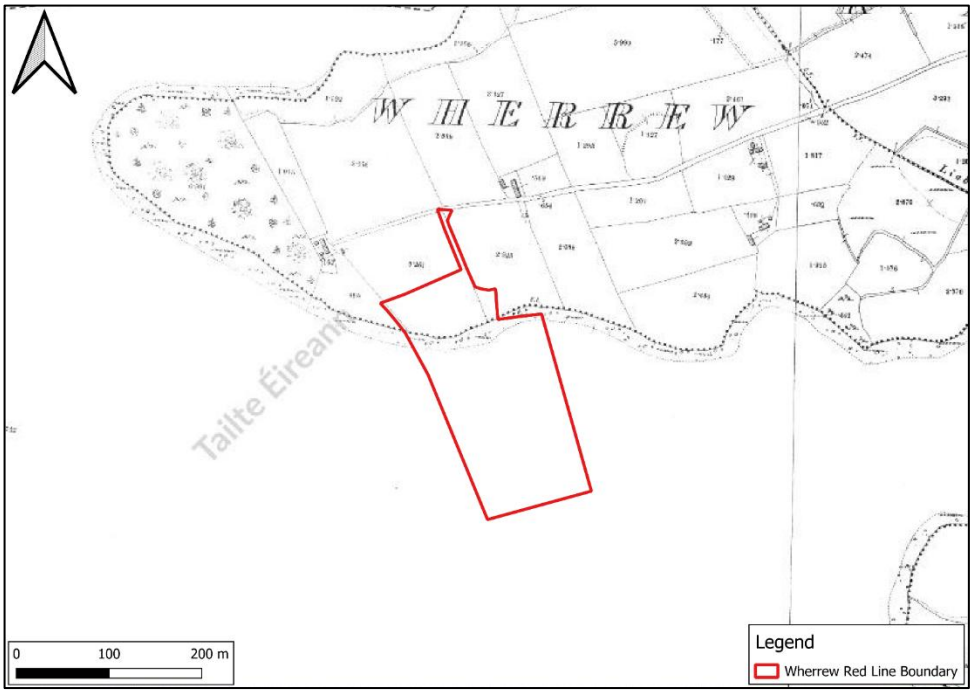


Figure 2-9 – OSI 25-inch Map – Wherrew RWI&PS

2.1.7 Mayo County Development Plan 2022-2028

The Mayo County Development Plan 2022–2028 (https://www.mayo.ie/planning/county-development-plans/2022-2028) is the statutory land-use planning framework for all development within County Mayo. The Plan, together with its Strategic Flood Risk Assessment (SFRA – Volume 5), provides the local policy context for flood risk management,

in accordance with the *Planning System and Flood Risk Management Guidelines for Planning Authorities* (DoEHLG, 2009). The SFRA was reviewed and observed that there was no data available for the Wherrew area.

2.1.8 Conclusion

This Stage 1 Flood Risk Assessment for the Wherrew Raw Water Intake and Raw Water Pumping Station has undertaken a review of all relevant flood zone mapping, geology, hydrology, site layout, and planning policy. The proposed works comprise targeted upgrades to existing critical water infrastructure, supporting the resilience of the regional supply system. Flood risk at the Wherrew site is governed primarily by fluvial (lake) flooding from Lough Conn. CFRAM and NFIM mapping confirm that the intake works and the lowest, lakeshore portion of the site are located within Flood Zone A (high probability of flooding), with a further portion extending into Flood Zone B (moderate probability).

Since the existing Wherrew Raw Water Pumping Station building is set back and elevated on higher ground, within Flood Zone C (low probability), it does not require a Stage 2 assessment. However, the existing intake structure and the proposed intake works are within Flood zones A/B. Hence a Stage 2 assessment is undertaken in Section 3.1 for these elements.

2.2 Lisglennon Raw Water Storage and Pumping Station (RWS&PS) Upgrade

The existing Lisglennon Raw Water Pumping Station (RWS&PS) is strategically located in the townland of Moyne, rural north County Mayo, approximately 8 km southeast of Ballina and about 1.5 km south of the regional R315–R314 junction. The RWS&PS lies to the west of the small settlement of Ballinteean and immediately south of Mullafarry (

Figure 2-10). The site is surrounded by low-intensity agricultural grasslands, subdivided by hedgerows and interspersed with a small number of farmsteads and rural dwellings.

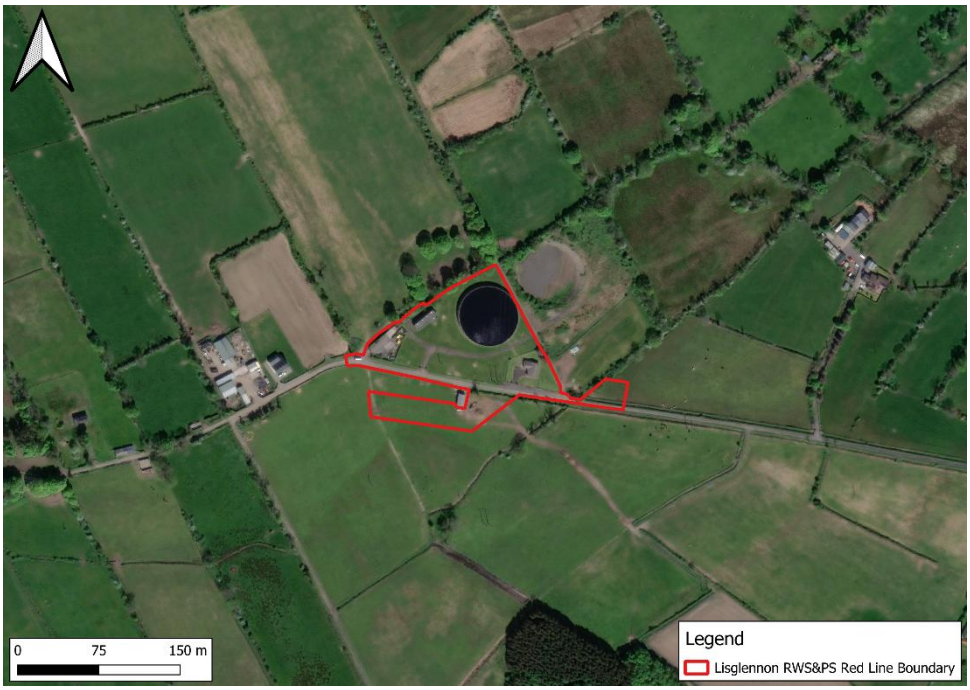


Figure 2-10 – Site Location – Lisglennon RWS&PS

2.2.1 Topography

The topography of the Lisglennon RWPS site and its environs is gently rolling, reflecting the characteristic lowland terrain of this part of north Mayo. Digital Elevation Model (DEM) data and topographic survey overlays confirm that site elevations range predominantly between approximately 42.5 m and 53.6 m above Ordnance Datum (OD), with the main operational area situated centrally within the gently contoured site boundary (Figure 2-11). Contour mapping and DEM visualisations indicate that the site is positioned on a broad, shallow plateau, which provides natural drainage away from operational infrastructure and minimises the risk of surface water accumulation. The immediate landform around the RWPS site slopes very gradually away from the main tank and building footprints. There are no pronounced hollows, natural depressions, or channels that would be susceptible to ponding or overland flow accumulation. The site is comfortably elevated above the nearest mapped fluvial floodplains, as verified by CFRAM overlays, providing an inherent buffer against potential inundation during extreme weather or high rainfall events. Overall, the setting and topography of the Lisglennon RWS&PS compound ensure that all critical infrastructure is located on well-drained, moderately elevated ground with no appreciable flood or drainage constraint.

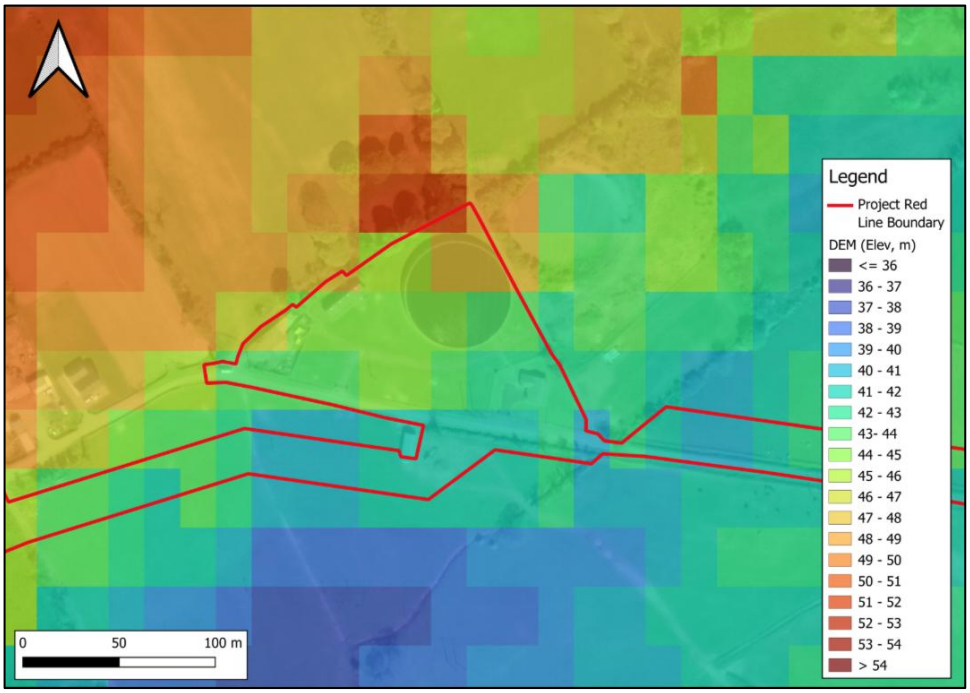


Figure 2-11 – Local Topography – Lisglennon RWS&PS

2.2.2 Local Hydrology & Existing Drainage

The Lisglennon RWPS site is situated within the Abbeytown_SC_010 WFD sub-catchment, as delineated on the provided hydrological map (Figure 2-12). The immediate environs of the site are characterised by gently undulating terrain, with the surface water drainage network dominated by minor drains and artificial ditches. These channels, identified as the local drainage network on the map, are predominantly field drains that provide connectivity between the developed area of the site and the broader sub-catchment system. No significant natural rivers or streams are present within or immediately adjacent to the site boundary. Surface water management relies on this site drainage infrastructure, which supports efficient runoff conveyance away from the operational footprint. The closest mapped watercourse appears as a drainage ditch at the site's southern margin, further integrating the site into the sub-catchment's hydrological regime. There is no evidence of any standing waterbodies, marshy ground, or wetlands in the vicinity of the site, indicating well-drained soils and an absence of localised surface water accumulation. The broader hydrological setting is defined by the boundaries of the Abbeytown_SC_010 and Cloonaghmore_SC_010 sub-catchments, with the site itself located near the interface of these units but firmly within Abbeytown_SC_010. This

context ensures that any surface water runoff generated by the site is routed through a well-established, predominantly artificial drainage network, with limited risk of direct connectivity to larger rivers or lakes. The existing drainage infrastructure at Lisglennon RWS&PS is typical for sites in the region, with minor ditches supporting effective runoff management and no indication of poor drainage or flood-prone features within or near the site.

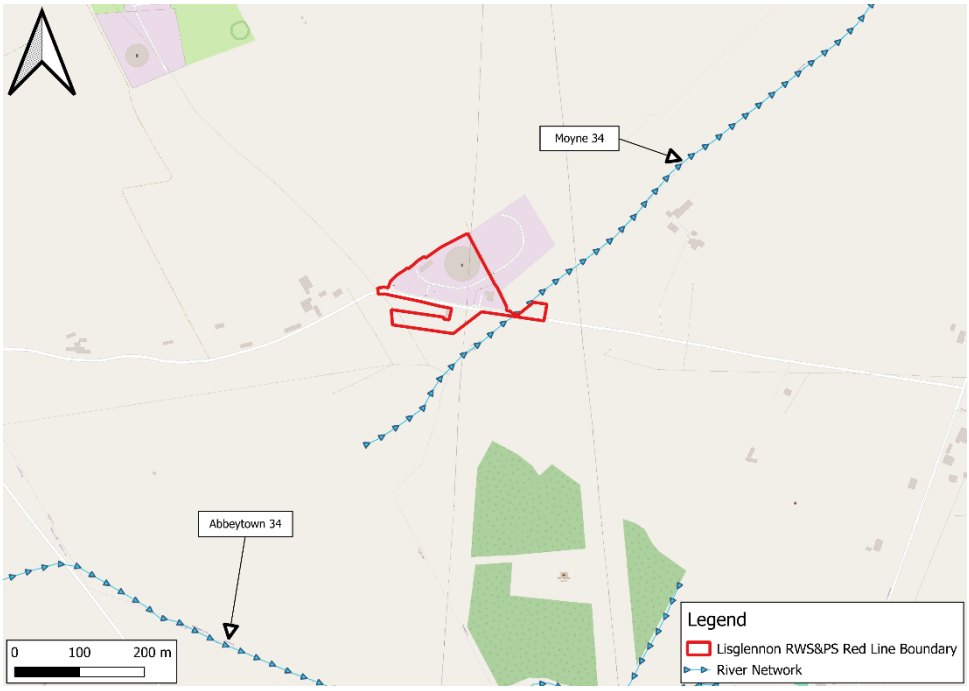


Figure 2-12 – Hydrological Features Map – Lisglennon RWS&PS

2.2.3 Geological Survey of Ireland Mapping

The Lisglennon RWS&PS site is underlain by Till derived from limestones, which overlies the Ballina Limestone Formation (Upper), according to the Geological Survey Ireland (GSI) bedrock mapping (2026) as shown in Figure 2-13. No other bedrock types are mapped within the site boundary or in the adjacent land parcels. Made Ground is anticipated with the existing site from the original construction of the site. Outcropping or near surface bedrock is indicated on the online mapping. Ballina Limestone Formations (Upper) are sedimentary rocks typically formed in marine environments, containing variable amounts of clay and silt. These characteristics generally result in lower permeability than pure limestones, which may influence local groundwater movement and drainage.

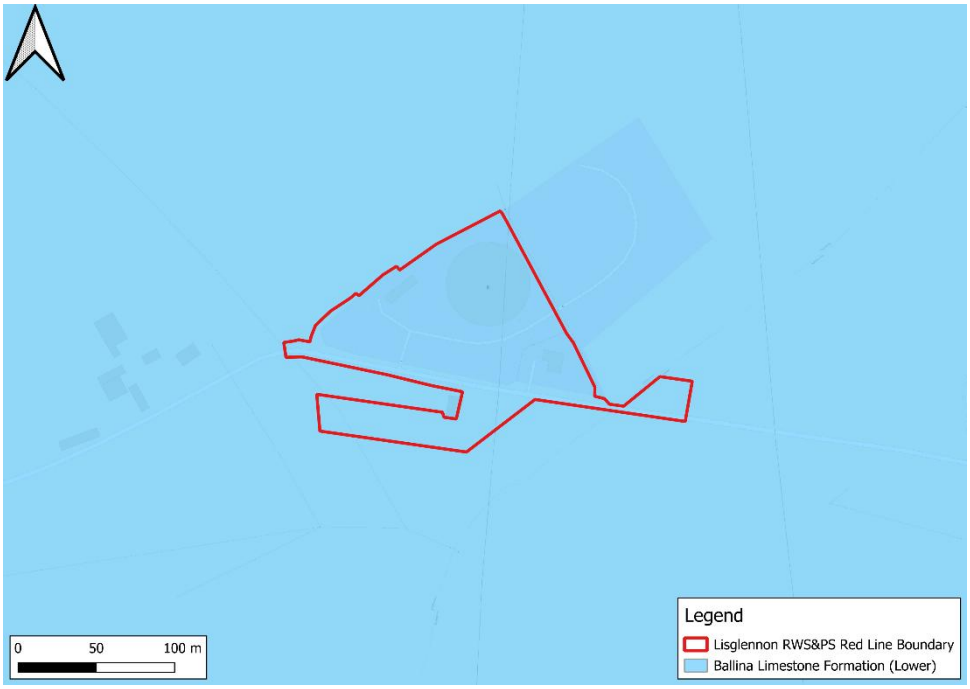


Figure 2-13 – GSI Bedrock Geology Map – Lisglennon RWS&PS

2.2.4 Flood Risk Identification of the Site

In accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009), a Stage 1 Flood Risk Identification has been undertaken to establish whether any flooding or surface water management issues exist at Lisglennon RWS&PS.

Table 2-2 Possible Flooding Mechanisms - Lisglennon RWS&PS

Source/Pathway	Significant?	Comment/Reason
Coastal flooding	No	>3 km inland, well above CFRAM coastal/tidal flood extents
Pluvial/Overland flow	No/Low	Not mapped; gently sloping ground; good field drainage
Fluvial/River flooding	No	Outside CFRAM/NFIM flood zones; no adjacent river channel
Flooding from artificial drainage systems	No	There are no major artificial or urban drainage systems on site. Minor field drains in adjacent agricultural land do not intersect the site.
Groundwater flooding	No	No GSI-mapped groundwater flood risk, turloughs, or groundwater/surface water flooding in or near the site..
Estuarial flooding	No	The site is far inland, with no tidal or estuarial flood influence
Failure of infrastructure	No	No history of failure, but ongoing maintenance required

2.2.5 Flood Risk Investigation

2.2.5.1 OPW Flood Maps

A preliminary flood risk assessment has been undertaken Lisglennon RWS&PS, in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009). The assessment utilised both national and local flood mapping datasets, with particular emphasis on the OPW's CFRAM predictive flood extent layers (available at www.floodinfo.ie). For fluvial (river) flood risk, the CFRAM mapping for Flood Zone A (1% Annual Exceedance Probability [AEP], or 1-in-100-year) and Flood Zone B (0.1% AEP, or 1-in-1,000-year) were reviewed and overlaid on the site boundary.

Fluvial/ River Flood Risk

A review of the fluvial flood risk at the Lisglennon Raw Water Pumping Station (RWS&PS) has been carried out using the most current and authoritative datasets available, including the OPW's Catchment Flood Risk Assessment and Management (CFRAM) maps, National Indicative Fluvial Mapping (NFIM), and the OPW historic flood events database. The mapping provided for this assessment shows the RWPS site boundary in relation to all known fluvial risk sources (Figure 2-14). The site is fully outside both the CFRAM 1% AEP (100-year) and 0.1% AEP (1,000-year) flood extents for the relevant local watercourses. There is no overlap between the site and the modelled floodplain under either standard or extreme fluvial scenarios. This is reinforced by the National Indicative Fluvial Mapping (NFIM) outputs, which show no indicative flood zones in the vicinity of the site for either event probability. The combined CFRAM and NFIM analysis confirms that the RWPS is not at risk from any mapped or historically experienced river flood event. Further, a review of the OPW's mapped historic flood events reveals no flood incidents recorded at or immediately adjacent to the RWS&PS. The nearest mapped event is located further upstream and does not correspond with local site topography or drainage pathways. The site itself is topographically separated from all main watercourses, and there are no secondary channels, overland flow routes, or field drains connecting the site to the Moyne River or other significant streams in the area. The closest mapped river network is several hundred metres south and east, with the intervening landscape being gently undulating and well-drained.

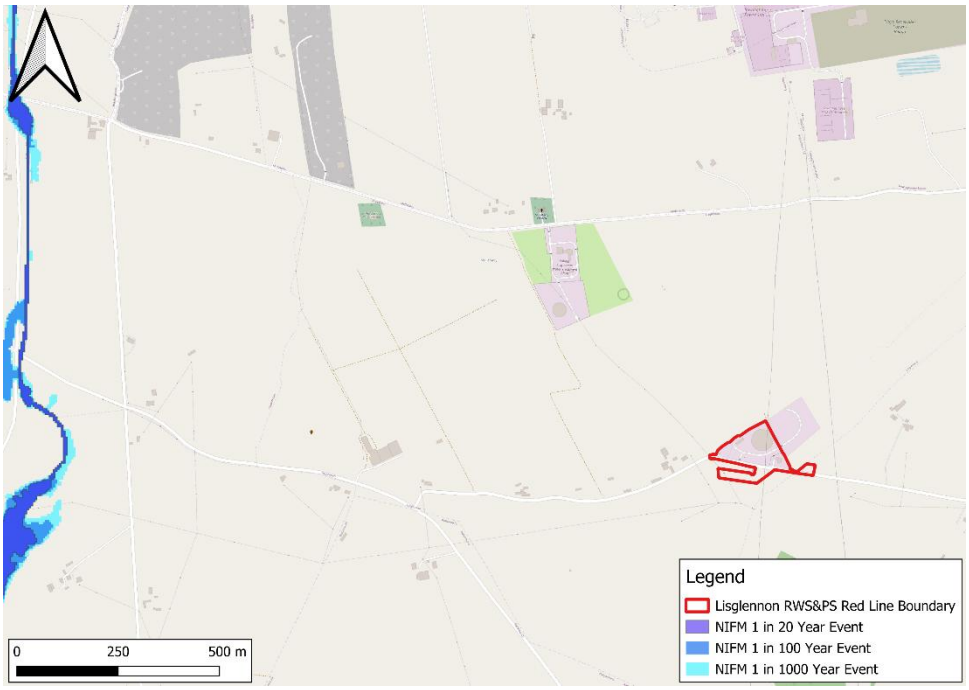


Figure 2-14 – Fluvial Flooding extents – Lisglennon RWS&PS

Coastal/Tidal Flood Risk

A review of the CFRAM coastal flood risk mapping has been undertaken for the Lisglennon Raw Water Storage & Pumping Station (RWS&PS) site, using the 0.5% AEP (200-year) and 0.1% AEP (1,000-year) coastal flood extents provided by the OPW (Figure 2-15). The site boundary was overlaid with these mapped extents, as well as with the local river network and relevant subcatchment boundaries, to establish any potential risk from tidal or coastal flooding. The CFRAM 0.5% and 0.1% coastal flood zones are clearly delineated along the immediate shoreline of Killala Bay and the River Moy estuary, situated more than 3 km to the northeast of the RWS&PS site. There is no intersection or proximity between these mapped tidal flood extents and the site boundary. The site itself is located on gently sloping agricultural land, at an elevation of approximately 48–54 metres OD, substantially higher than the maximum mapped extent of coastal or tidal flooding, and with intervening topography and land uses that preclude any potential overland or channelised flood pathway from the coast to the RWS&PS. There are no minor tidal tributaries, channels, or culverts connecting the coast or estuary to the site, nor is there any low-lying corridor or topographic depression that could facilitate tidal water movement inland under either present or future (climate change) conditions. This remains true even under the 0.1% AEP scenario, which is intended to account for extreme sea level rise and climate effects.

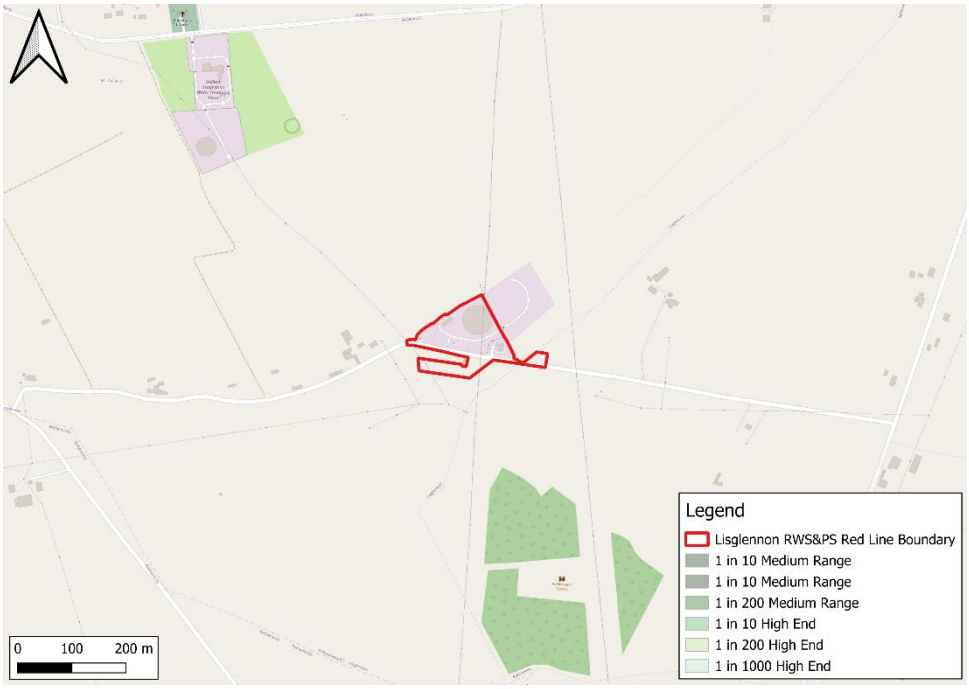


Figure 2-15 – Coastal / Tidal Flooding extents – Lisglennon RWS&PS

Groundwater Flood Risk

A review of the GSI (Geological Survey Ireland) maximum historic groundwater flood mapping and high-probability groundwater flood layers has been undertaken for the Lisglennon Raw Water Storage and Pumping Station (RWS&PS) site (Figure 2-16). The analysis included all mapped flood polygons for historic groundwater/surface water interactions, high-probability groundwater flood zones, and the presence of karst features, boreholes, or caves. The RWS&PS site and its immediate surroundings do not intersect with any mapped maximum historic groundwater flooding extents, nor does the site fall within any high-probability groundwater flood polygons. There are no GSI-mapped turloughs, karst landforms, or groundwater emergence points within or adjacent to the site boundary. The nearest mapped groundwater risk polygons and karst features are located at a significant distance from the RWS&PS, well beyond the site's hydrological and operational context. Site-specific topography further supports this screening conclusion that the RWS&PS is situated on moderate, gently sloping ground, with no evidence of local low points, depressions, or enclosed basins that could facilitate groundwater flooding or ponding under extreme conditions. The lack of springs, wells, or groundwater-dependent ecosystems on or near the site reduces the potential for unforeseen

groundwater interactions. In summary, there is no evidence or mapping of groundwater flood risk at or near the Lisglennon RWPS site. The risk of flooding from this source is considered negligible, and no further detailed assessment or mitigation measures are required for groundwater flooding.

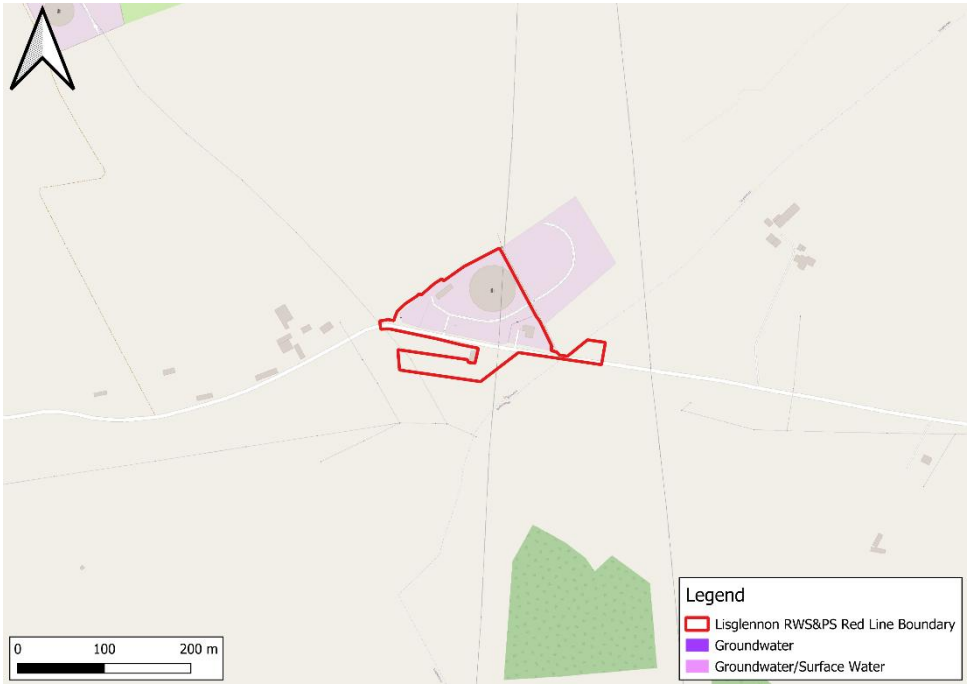


Figure 2-16 – Groundwater Flooding Extents – Lisglennon RWS&PS

2.2.6 Historical Maps

A review of historic Ordnance Survey Ireland (OSI) mapping has been undertaken for the Lisglennon Raw Water Pumping Station (RWPS) site, via the ArcGIS web viewer (https://www.arcgis.com/apps/webappviewer/) incorporating both the 6-inch (early to mid-19th century) and 25-inch (late 19th to early 20th century) editions (Figure 2-17 and Figure 2-18). These sources provide valuable evidence of the site's historical land use, water features, and any indications of previous flood risk or surface water management challenges. The earlier 6-inch map depicts a possible open drain or watercourse near the site's northern edge, but shows no significant wetlands, waterbodies, or signs of recurrent wet ground. The more detailed 25-inch map similarly shows a landscape of enclosed fields, with nearby features such as a ford and a well, but no surface water features or indications of flooding within the site boundary. Across both map editions, there is no historic evidence of marshland, ponding, or flood-prone areas at the current RWS&PS location, supporting the conclusion that the site has not historically been subject to persistent flooding or waterlogging.

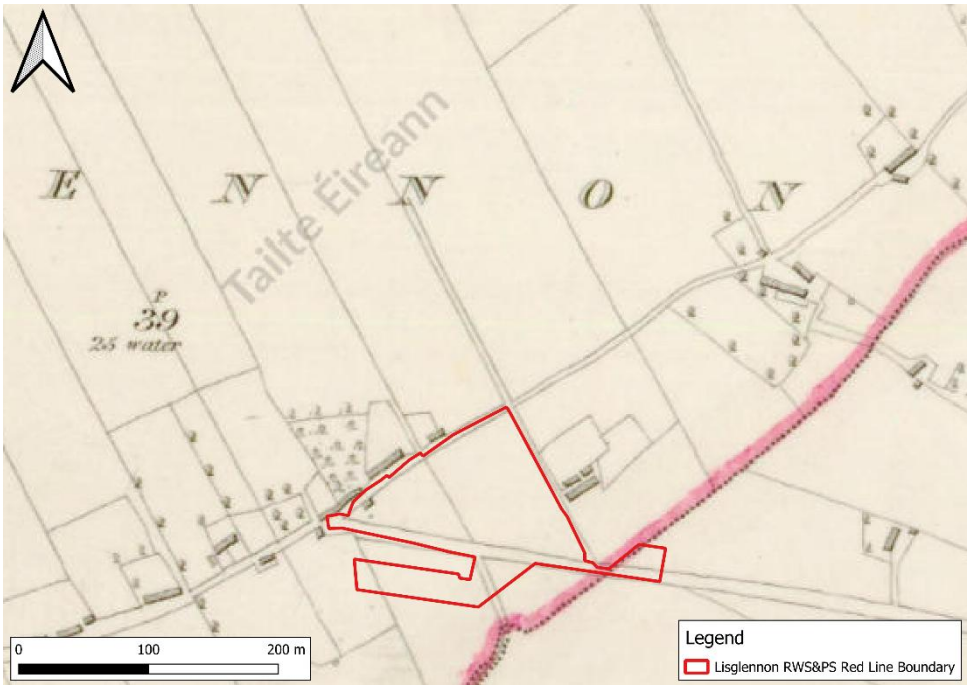


Figure 2-17 – OSI 6-inch Map – Lisglennon RWS&PS

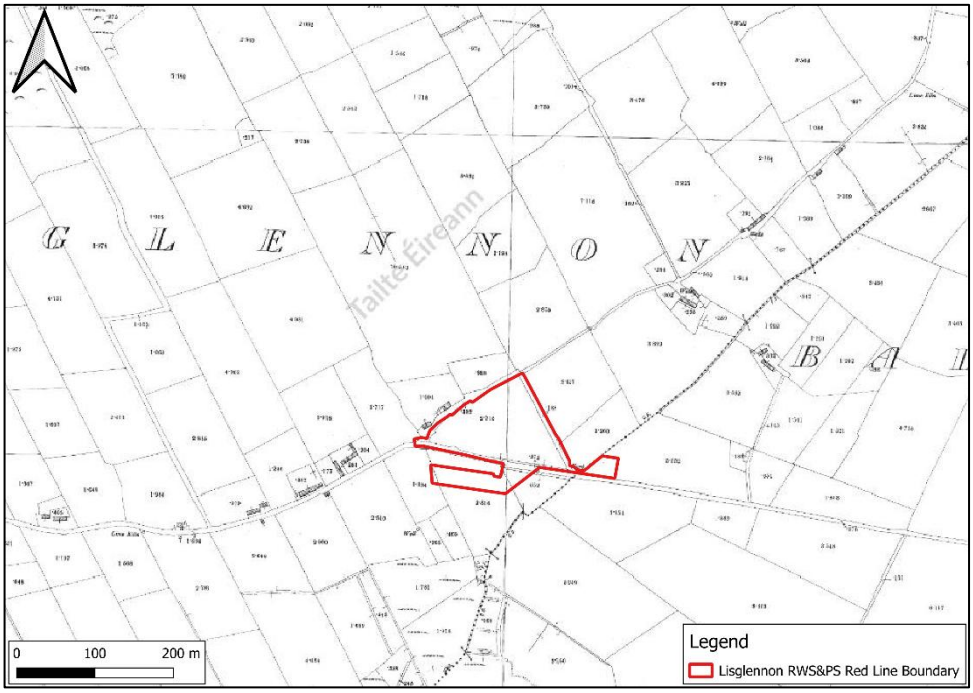


Figure 2-18 – OSI 25-inch Map – Lisglennon RWS&PS

2.2.7 Mayo County Development Plan 2022-2028

The Mayo County Development Plan 2022–2028 (https://www.mayo.ie/planning/county-development-plans/2022-2028) is the statutory land-use planning framework for all development within County Mayo. The Plan, together with its Strategic Flood Risk Assessment (SFRA – Volume 5), provides the local policy context for flood risk management,

in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG, 2009). The SFRA was reviewed and observed that there was no data available for the Lisglennon area.

2.2.8 Conclusion

The Stage 1 Flood Risk Assessment for the Lisglennon Raw Water Storage and Pumping Station (RWS&PS) has comprehensively screened all sources of flooding, including fluvial, coastal/tidal, groundwater, and surface water (pluvial) risk. This assessment drew on OPW CFRAM and NFIM datasets, GSI groundwater flood mapping, the Mayo County Development Plan 2022–2028 and its SFRA, and site-specific topographic and hydrological data. The RWS&PS site is confirmed to be entirely within Flood Zone C for all relevant sources, with no mapped flood risk overlays, no recorded flood history, and no evidence of historic or potential flooding from any mechanism. The site is not within or adjacent to a river channel, floodplain, tidal corridor, or groundwater flood zone. The proposed development is fully compliant with the Mayo County Development Plan 2022–2028 and the associated SFRA, and a Justification Test is not required.

2.2.9 Recommendations

As the Lisglennon RWPS is located in Flood Zone C and is water-compatible development, this Stage 1 Flood Risk Assessment is concluded here. No further flood risk assessment (Stage 2 or 3) is required. It is recommended that the site continue to maintain robust surface water drainage in accordance with good practice and Mayo County Development Plan requirements for Sustainable Drainage Systems (SuDS), to ensure resilience to local rainfall events. No additional flood mitigation measures are warranted or required.

2.3 Lisglennon Water Treatment Plant (WTP)

The Lisglennon Water Treatment Plant (WTP) is located in rural northeast County Mayo, approximately 7 km southeast of Ballina, with direct access from the L11109 regional road (Figure 2-19). The site is surrounded primarily by open agricultural land, with scattered rural residences in the vicinity, and occupies a large, well-defined compound set back from the public road. The site functions as the operational hub of the Proposed Development.



Figure 2-19 – Site Location – Lisglennon WTP

2.3.1 Topography

The Lisglennon WTP is sited on a gently undulating plateau at elevations between approximately 48.0 m and 53.6 m OD, as confirmed by the DEM and topographic survey data (Figure 2-20). The central and southern portions of the site slope gently downwards from slightly higher ground along the western and northern boundaries, resulting in a subtle but effective local gradient that promotes good drainage. There are no steep gradients, pronounced depressions, or adjacent watercourses within or immediately surrounding the site. The open pastureland and agricultural fields that surround the WTP are typical of this region of County Mayo, with broad, low-relief terrain providing ideal conditions for water infrastructure development. All critical structures, both existing and proposed, are, or will be, constructed on raised ground, with finished floor levels set above the surrounding land to minimise the risk of surface water ponding or accumulation.

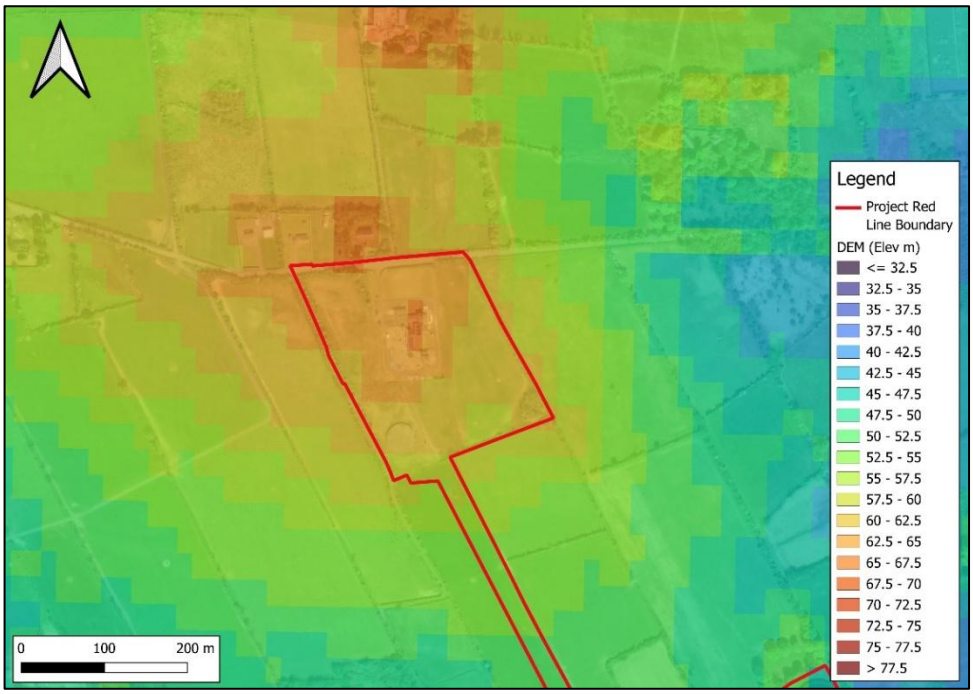


Figure 2-20 – Local Topography – Lisglennon WTP

2.3.2 Local Hydrology & Existing Drainage

The Lisglennon Water Treatment Plant (WTP) is situated in a rural setting between the Cloonaghmore_SC_010 and Abbeytown_SC_010 WFD sub-catchments, approximately 2 km north of the River Moy, on gently sloping ground with elevations ranging from 47 to 54 m OD. The site itself is not intersected by any natural rivers or streams; instead, minor field ditches and drains along the boundary and within adjacent agricultural lands provide local surface water drainage. According to the updated hydrographic mapping (Figure 2-21), the nearest significant watercourse is the Moyne_34 river channel, which flows northeast of the site boundary and forms part of the local river network connecting to larger arterial drainage channels further south. The nearest arterial drainage channel is located to the south and southwest of the WTP, with no direct hydraulic connection to the site, and the closest mapped river network feature is over 400 m away. Surface water runoff from the WTP is managed by site drainage in the form of gullies, pipe network and soakaways. There is no evidence of significant ponding or wetland features within the site. Overall, the local hydrology is characterised by isolated minor drains, and there are no surface water or drainage features within or near the WTP that present a direct flood risk to the site.

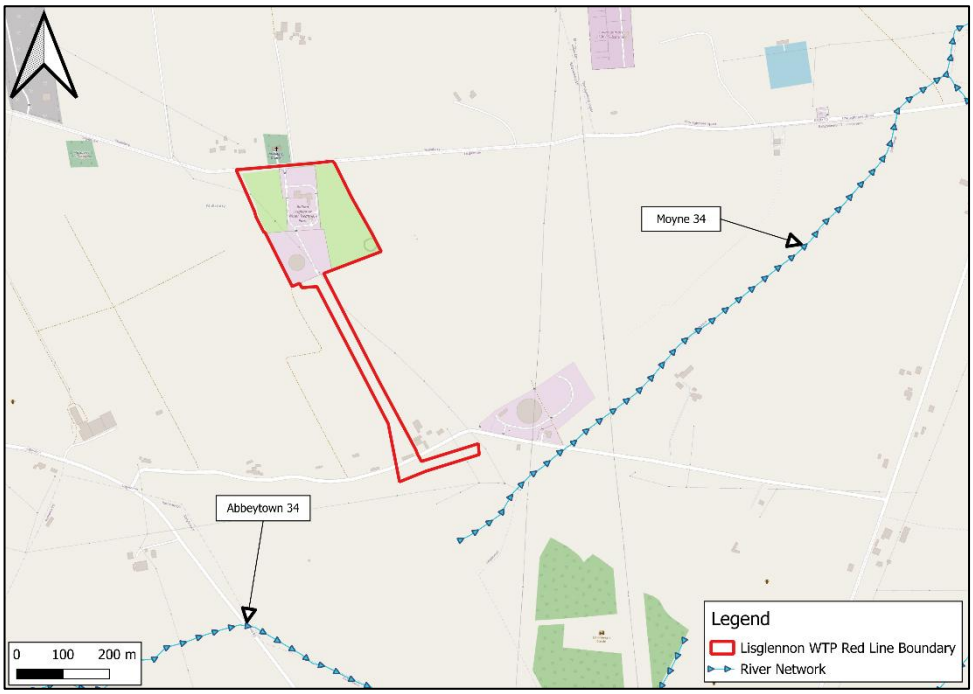


Figure 2-21 – Hydrological Features Map – Lisglennon WTP

2.3.3 Geological Survey of Ireland Mapping

The Lisglennon Water Treatment Plant (WTP) is underlain by Till derived from limestones, which overlies the Ballina Limestone Formation (Upper), as indicated by the Geological Survey of Ireland (GSI) bedrock mapping (Figure 2-22). This limestone formation is typically composed of argillaceous limestones with variable clay content, resulting in moderate permeability that can support both groundwater storage and flow. No significant geological faults or karst features have been identified within or near the site boundary, and there is no evidence of alluvial or unconsolidated deposits that could increase susceptibility to fluvial flooding. Made Ground is anticipated with the existing site from the original construction of the site. The absence of mapped karst features, together with the uniform limestone geology, indicates a low risk of rapid groundwater flooding or unpredictable subsurface drainage in the immediate vicinity of the WTP.

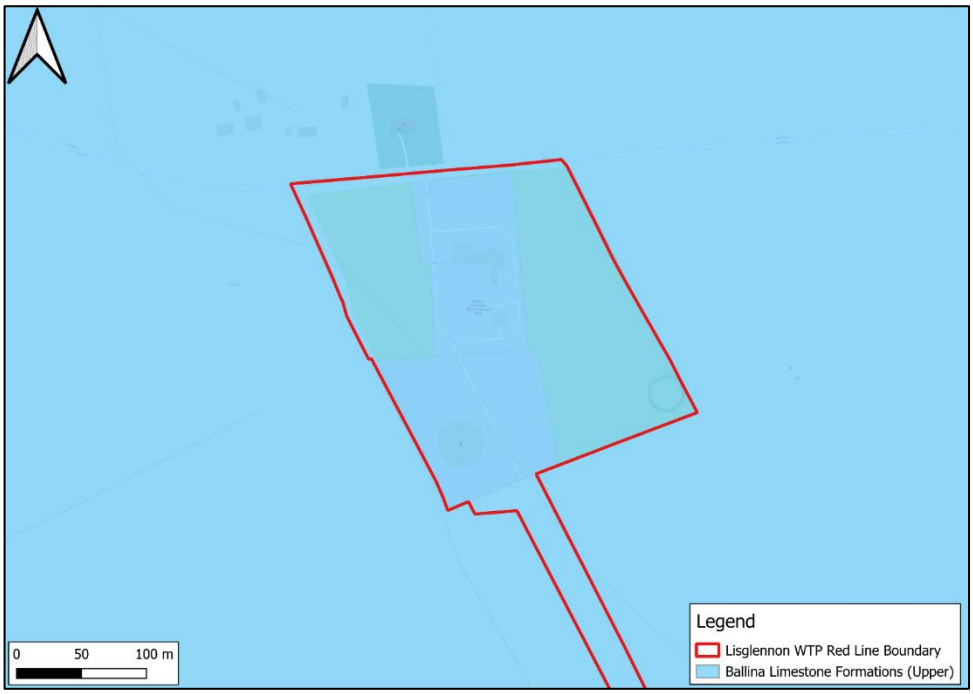


Figure 2-22 – GSI Bedrock Geology Map – Lisglennon WTP

2.3.4 Flood Risk Identification of the Site

In accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009), a Stage 1 Flood Risk Identification has been undertaken to establish whether any flooding or surface water management issues exist at Lisglennon Water Treatment Plant (WTP).

Table 2-3 Possible Flooding Mechanisms – Lisglennon WTP

Source/Pathway	Significant?	Comment/Reason
Coastal flooding	No	Site >2 km inland, well above CFRAM tidal extents.
Pluvial/Overland flow	No/Low	No mapped pluvial risk
Fluvial/River flooding	No	No CFRAM/NFIM flood zones or river channels at site.
Flooding from artificial drainage system	No	There are no major artificial or urban drainage systems on site. Minor field drains in adjacent agricultural land do not intersect the site.
Groundwater flooding	No	No GSI-mapped groundwater flood risk, turloughs, or groundwater/surface water flooding in or near the site
Estuarial flooding	No	The site is far inland, with no tidal or estuarial flood influence
Failure of infrastructure	No	No history of failure, but ongoing maintenance required

2.3.5 Flood Risk Investigation

2.3.5.1 OPW Flood Maps

Fluvial/River Flood Risk

The Lisglennon Water Treatment Plant site was assessed using the most up-to-date OPW Catchment Flood Risk Assessment and Management (CFRAM) mapping for the 1% AEP (100-year) and 0.1% AEP (1,000-year) fluvial flood scenarios, as well as National Indicative Fluvial Mapping (NFIM) for the same probability events (Figure 2-23). The site lies entirely outside the mapped flood extents for both datasets and all scenarios. No historic fluvial flood events have been recorded at, or adjacent to, the WTP. Accordingly, the site is classified as Flood Zone C for fluvial flood risk, as per the Planning Guidelines.

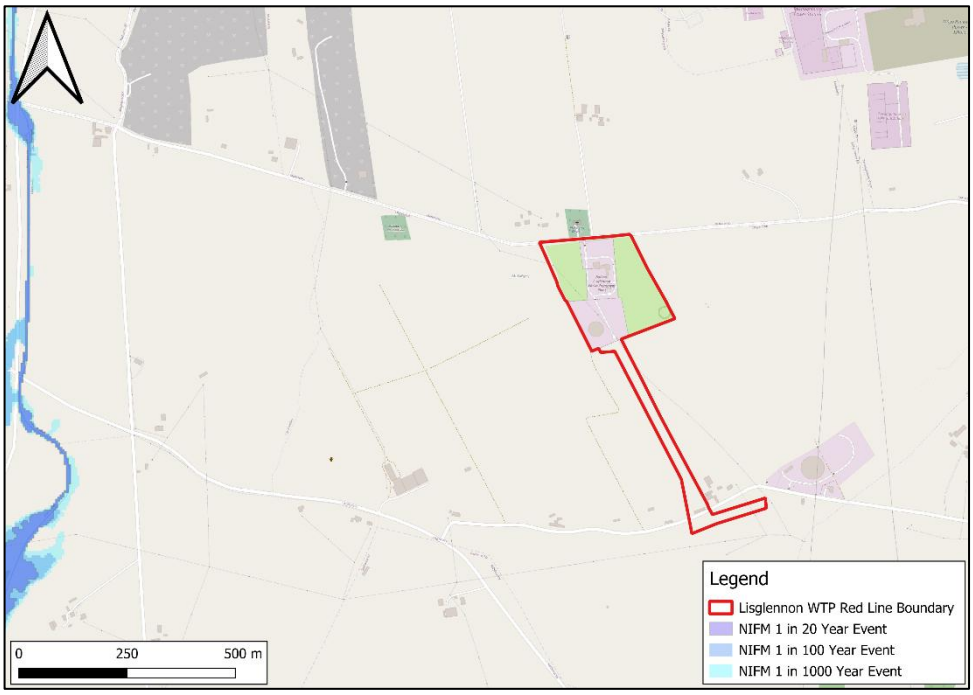


Figure 2-23 – Fluvial Flooding extents – Lisglennon WTP

Coastal/Tidal Flood Risk

A review of the OPW CFRAM coastal flood extents for the 0.5% and 0.1% annual probability (AEP) events was undertaken for the Lisglennon Water Treatment Plant (Figure 2-24). The site is located more than 2 km inland from Killala Bay and the River Moy estuary, with mapped coastal flood zones confined to the shoreline areas. The site elevation (48–54 m OD) and local topography preclude any plausible overland or channel pathway for tidal or coastal floodwaters to affect the site. Even under extreme (climate change) conditions, the WTP remains entirely outside the mapped flood extents.

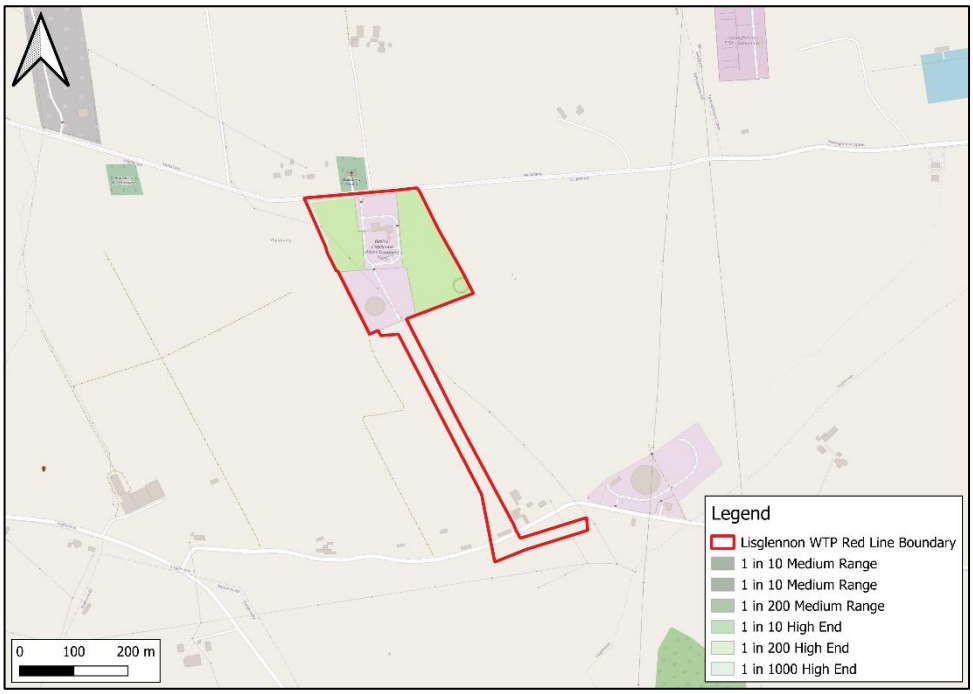


Figure 2-24 – Coastal / Tidal Flooding extents – Lisglennon WTP

Groundwater Flood Risk

A review of the GSI maximum historic groundwater flood mapping and high-probability groundwater flood layers confirms that the Lisglennon Water Treatment Plant site is not located within any known area of historic or modelled groundwater flooding (Figure 2-25). The site and its immediate surroundings do not intersect with any mapped groundwater flood zones, nor are there any mapped turloughs, karst features, or known groundwater discharge points in the vicinity. The absence of high-probability groundwater flood polygons or maximum historic groundwater flood extents within or adjacent to the site indicates that the risk of groundwater flooding at Lisglennon WTP is considered to be very low. Furthermore, the underlying geology and local landform do not support the presence of karstic features that are typically associated with rapid groundwater level changes or seasonal flooding in western Ireland. No groundwater-dependent ecosystems, wells, or springs are indicated on or near the site, and there is no evidence of surface water/groundwater interaction that could increase local flood hazard.

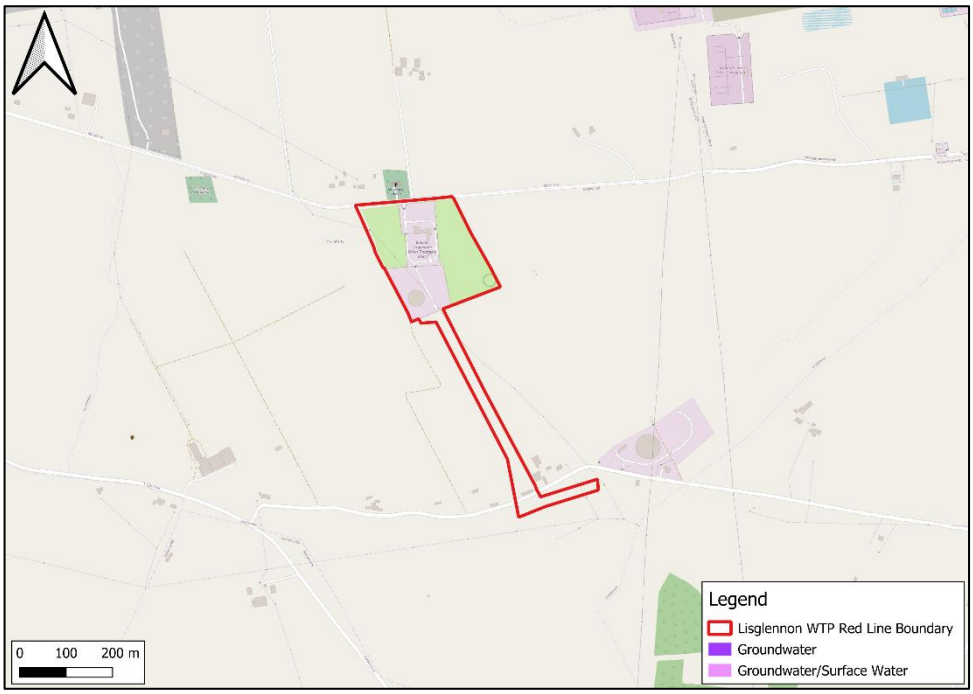


Figure 2-25 – Groundwater Flooding extents – Lisglennon WTP

2.3.6 Historical Maps

A review of historic Ordnance Survey Ireland (OSI) mapping has been undertaken for the Lisglennon WTP boundary, via the ArcGIS web viewer (https://www.arcgis.com/apps/webappviewer/) incorporating both the 6-inch and 25-inch editions (Figure 2-26 and Figure 2-27). A review of both the 6-inch and 25-inch Ordnance Survey Ireland (OSI) historic maps reveals no evidence of past flooding, waterlogged areas, or significant watercourses within the Lisglennon WTP site boundary. The site is depicted as agricultural land on both map editions, with regularly divided field parcels and no indications of drains, marshes, or other features suggestive of historic flood susceptibility. Surrounding areas also lack mapped rivers or streams, and there are no notations of historical flood events, water accumulation, or wet ground.

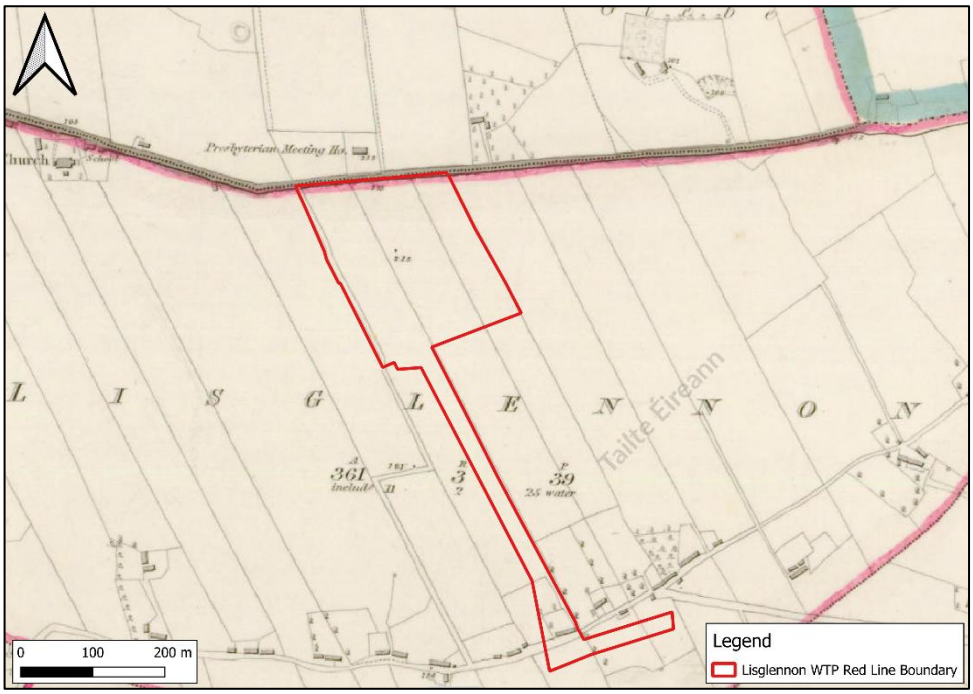


Figure 2-26 – OSI 6-inch Map – Lisglennon WTP

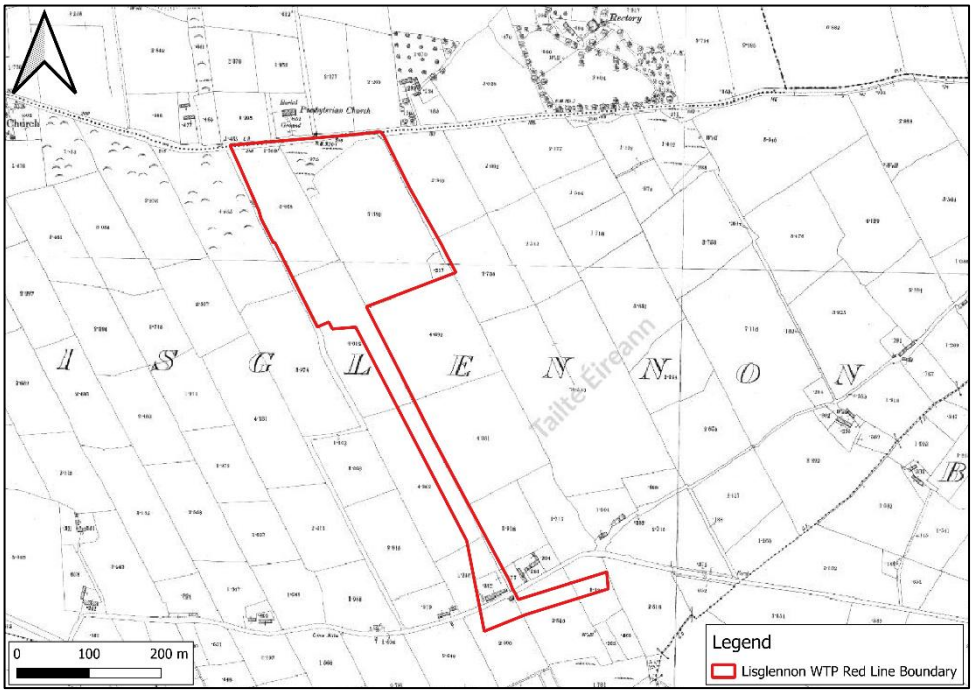


Figure 2-27 – OSI 25-inch Map – Lisglennon WTP

2.3.7 Mayo County Development Plan 2022-2028

The Mayo County Development Plan 2022–2028 (https://www.mayo.ie/planning/county-development-plans/2022-2028) is the statutory land-use planning framework for all development within County Mayo. The Plan, together with its Strategic Flood Risk Assessment (SFRA – Volume 5), provides the local policy context for flood risk management,

in accordance with the *Planning System and Flood Risk Management Guidelines for Planning Authorities* (DoEHLG, 2009). The SFRA was reviewed and observed that there was no data available for the Lisglennon area.

2.3.8 Conclusion

The Flood Risk Assessment for the Lisglennon Water Treatment Plant (WTP) confirms that the site is situated entirely outside the extents of all mapped Flood Zone A and Flood Zone B areas, and is not affected by any modelled or historic fluvial, coastal, or groundwater flood risk. There are no significant watercourses or drainage features directly intersecting the site, and local topographic and drainage conditions do not present any material flood risk. The assessment, supported by CFRAM data, county flood zoning, and GSI groundwater mapping, demonstrates that all relevant sources of flood risk, including fluvial, pluvial, coastal, groundwater, and infrastructure failure, have been appropriately considered, with no significant risks identified. The proposed development is fully compliant with the Mayo County Development Plan 2022–2028 and the associated SFRA, and a Justification Test is not required.

2.3.9 Recommendations

Based on the findings of this Stage 1 FRA, no further flood risk assessment (Stage 2 or 3) is required for Lisglennon WTP. The development is appropriate in its location from a flood risk perspective, with no need for specific flood mitigation measures beyond standard site drainage design and maintenance practices. It is recommended that future maintenance of on-site drainage infrastructure continues in accordance with good practice to prevent any local surface water ponding. All proposed works should also comply with current Mayo County Development Plan policies on surface water management and Sustainable Drainage Systems (SuDS).

2.4 Bonniconlon Booster Pumping Station (BPS)

The Bonniconlon Booster Pumping Station (BPS) is a greenfield site located in east County Mayo, approximately 3 km south of Bonniconlon village and immediately west of the R294 regional road (Figure 2-28).

The site is situated close to the Srafaungal River but is set back from the main watercourse, as confirmed by the provided site layout and mapping. The surrounding area is predominantly low-density agricultural land, with scattered rural dwellings and farmsteads in the immediate vicinity.

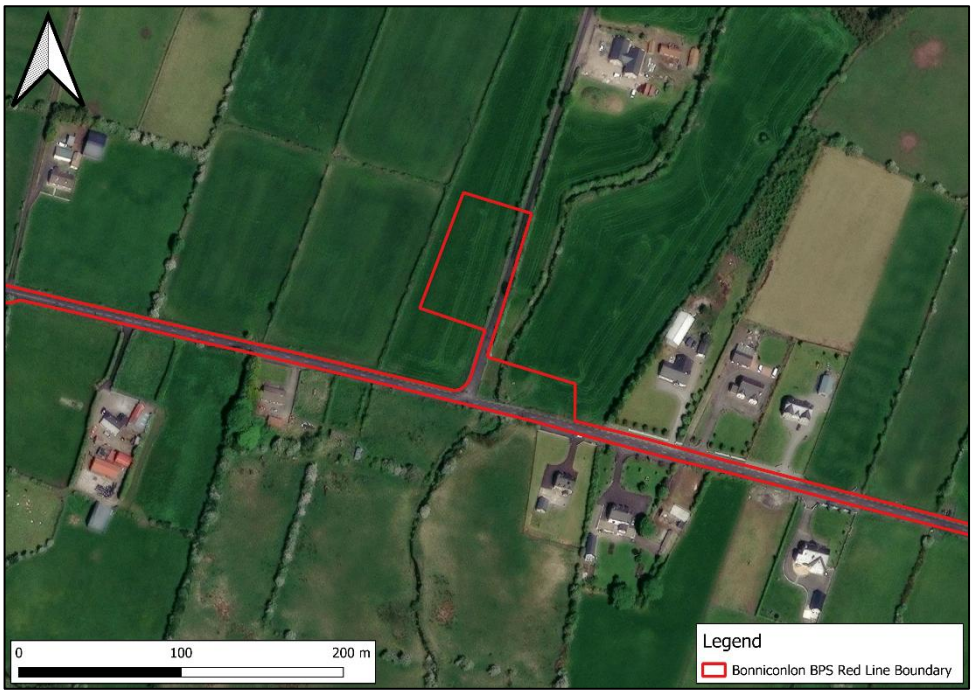


Figure 2-28 – Site location – Bonniconlon BPS

2.4.1 Topography

Topographic analysis based on the supplied DEM (Figure 2-29), site layout drawings, and aerial imagery confirms that the Bonniconlon BPS site occupies a gently undulating site on a shallow east-facing slope. Ground elevations across the operational footprint range from approximately 30.0 m OD at the lower site boundary to just above 36.0 m OD at the highest point towards the northwest of the site. The site is positioned on a broad, slightly sloping plateau, offering favourable drainage away from critical equipment and structures. Contour mapping shows that the site is not susceptible to natural depressions or local ponding, and there are no adjacent hollows or low-lying areas that would exacerbate pluvial or groundwater flood risk.

The nearby Srafaungal River flows northward approximately 60 m east of the site boundary, but the BPS itself is set on rising ground well above the mapped riverbank and associated floodplain. A combination of gentle site grading, perimeter landscaping, and established local drainage patterns ensures that overland flow is effectively managed and directed away from operational assets. The overall landscape character is open, pastoral, and low-lying, with reliable road access and no significant hydrological or topographic constraints to the planned development.

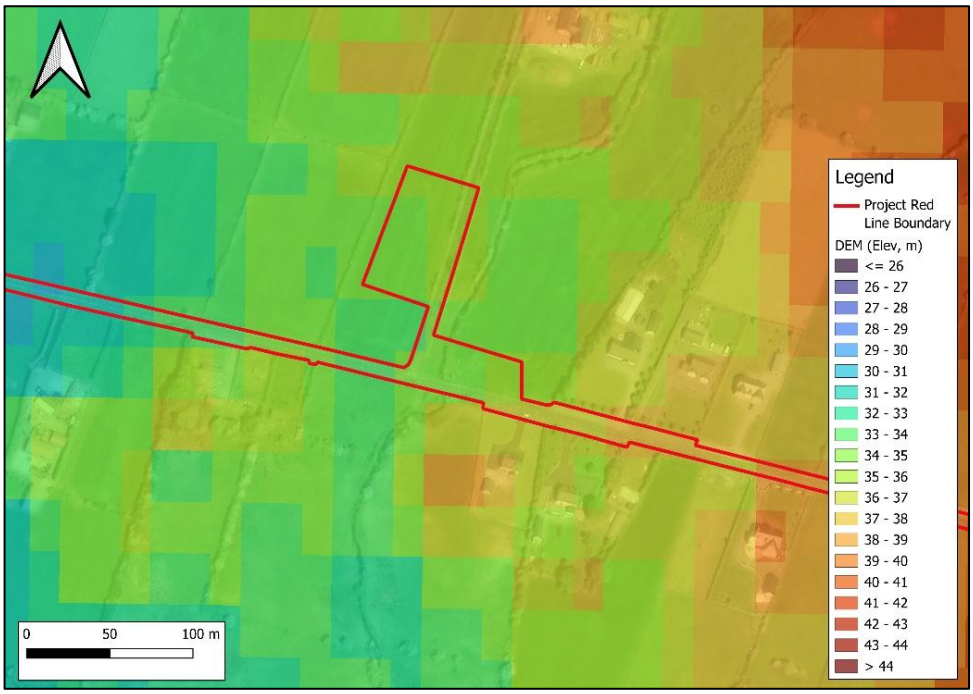


Figure 2-29 – Local Topography- Bonniconlon BPS

2.4.2 Local Hydrology & Existing Drainage

The Bonniconlon Booster Pumping Station (BPS) is situated within the Glenree_SC_010 subcatchment, part of the wider Moy river basin (Figure 2-30). The immediate hydrological setting is defined by a network of minor streams and artificial field drains that provide efficient runoff pathways across the gently sloping agricultural landscape. The most significant local watercourse is the Srafaungal Stream, which flows parallel to and just east of the site boundary before joining larger downstream channels that ultimately discharge to the Glenree River. The Srafaungal Stream, while modest in scale, forms a natural drainage axis for the area. Its channel is well-defined and typically set below the main site platform, with a vegetated buffer zone providing a separation between the site and the stream's bank. In addition to the mainstream, several minor field drains and shallow roadside ditches traverse the surrounding fields, intercepting surface water and directing it towards the Srafaungal and adjacent drainage channels. These features contribute to the generally free-draining character of the site, with overland flow pathways following natural ground gradients towards the eastern and southern boundaries.

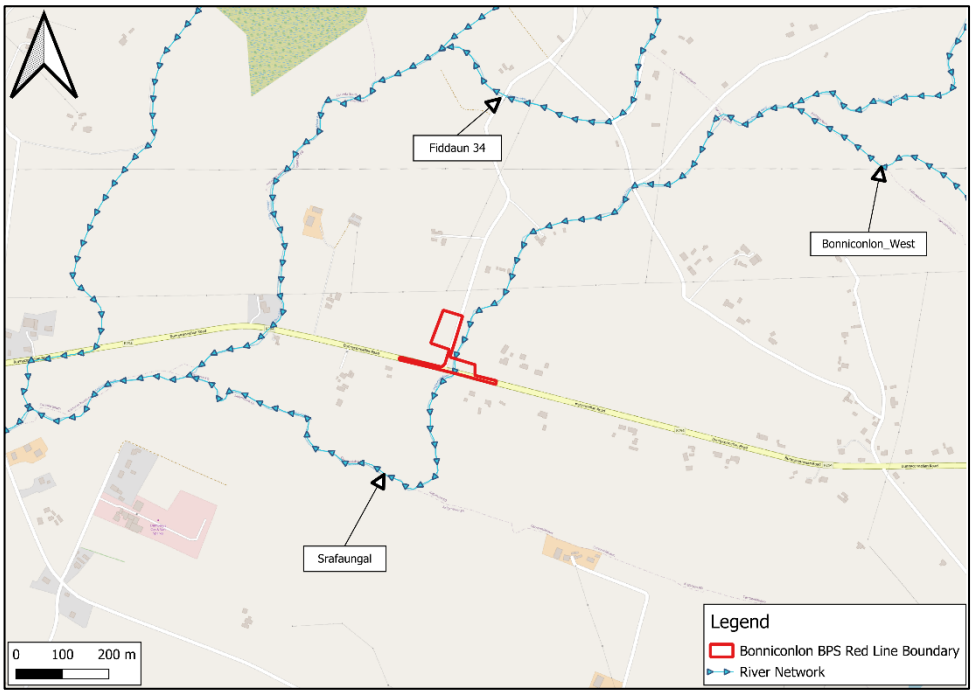


Figure 2-30 – Hydrological Features Map – Bonniconlon BPS

2.4.3 Geological Survey of Ireland Mapping

The superficial deposits are recorded as Till derived from limestones. The underlying bedrock geology at the Bonniconlon Booster Pumping Station (BPS) site is recorded as Ballina Limestone Formation (Upper), as indicated by the Geological Survey of Ireland (GSI) bedrock geology mapping (Figure 2-23). This lithology is typically characterised by well-bedded, pale grey to bluish limestones and thin shale units. Such bedrock is generally associated with moderate to high permeability, supporting both groundwater flow and limited surface water retention.

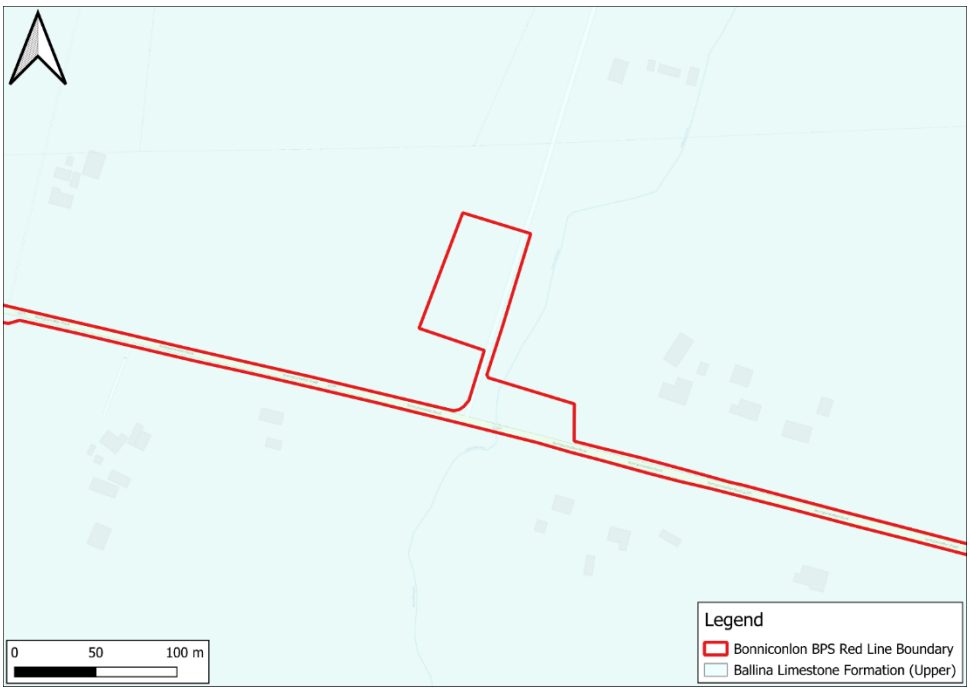


Figure 2-31 – GSI Bedrock Geology Map – Bonniconlon BPS

2.4.4 Flood Risk Identification of the Site

In accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009), a Stage 1 Flood Risk Identification has been undertaken to establish whether any flooding or surface water management issues exist at Bonniconlon Booster Pumping Station (BPS).

Table 2-4 Possible Flooding Mechanisms – Bonniconlon BPS

Source/Pathway	Significant?	Comment/Reason
Coastal flooding	No	>20 km inland, >30 m OD, well above coastal/tidal flood extents
Pluvial/Overland flow	No/Low	Site is well-drained; no mapped/planned ponding
Fluvial/River Flooding	No	Main infrastructure set above mapped extents
Flooding from artificial drainage systems	No	There are no artificial or urban drainage systems on site. Minor field drains in adjacent agricultural land do not intersect the site.
Groundwater flooding	No	No GSI-mapped groundwater flood risk, turloughs, or groundwater/surface water flooding in or near the site. Nearest mapped risk >200 m away.
Estuarial flooding	No	The site is far inland, with no tidal or estuarial flood influence.
Failure of infrastructure	No	No history of failure, but ongoing maintenance required

2.4.5 Flood Risk Investigation

2.4.5.1 OPW Flood Maps

A preliminary flood risk assessment has been undertaken for the Bonniconlon Booster Pumping Station (BPS) site, in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009). The assessment utilised both national and local flood mapping datasets, with particular emphasis on the OPW's CFRAM predictive flood extent layers (available at www.floodinfo.ie). For fluvial (river) flood risk, the CFRAM mapping for Flood Zone A (1% Annual Exceedance Probability [AEP], or 1-in-100-year) and Flood Zone B (0.1% AEP, or 1-in-1,000-year) were reviewed and overlaid on the site boundary.

Fluvial/River Flood Risk

A review of the fluvial flood risk at the Bonniconlon Booster Pumping Station (BPS) site has been carried out using the best available national datasets, namely the National Indicative Fluvial Mapping (NFIM), Catchment Flood Risk Assessment and Management (CFRAM) maps, and OPW historic flood event records (Figure 2-32). For this location, CFRAM mapping is not available or does not provide coverage for the Srafaungal River at the site, and therefore the NFIM dataset serves as the primary source of indicative floodplain extents. The mapped 1% AEP (Flood Zone A) and 0.1% AEP (Flood Zone B) NFIM flood extents just touches the site boundary on the eastern and southern side. The NFIM mapping confirms that while the theoretical floodplain skirts the eastern and southern edges of the BPS site, there are no direct hydraulic connections or overland flow paths between the river and the site under present and foreseeable future conditions. No historic records of fluvial flooding at the compound are reported in the OPW flood event database or local authority incident logs, and there is no evidence of previous floodwater ingress to the main operational areas. In summary, the BPS site is just outside NFIM-mapped Flood Zones A and B.

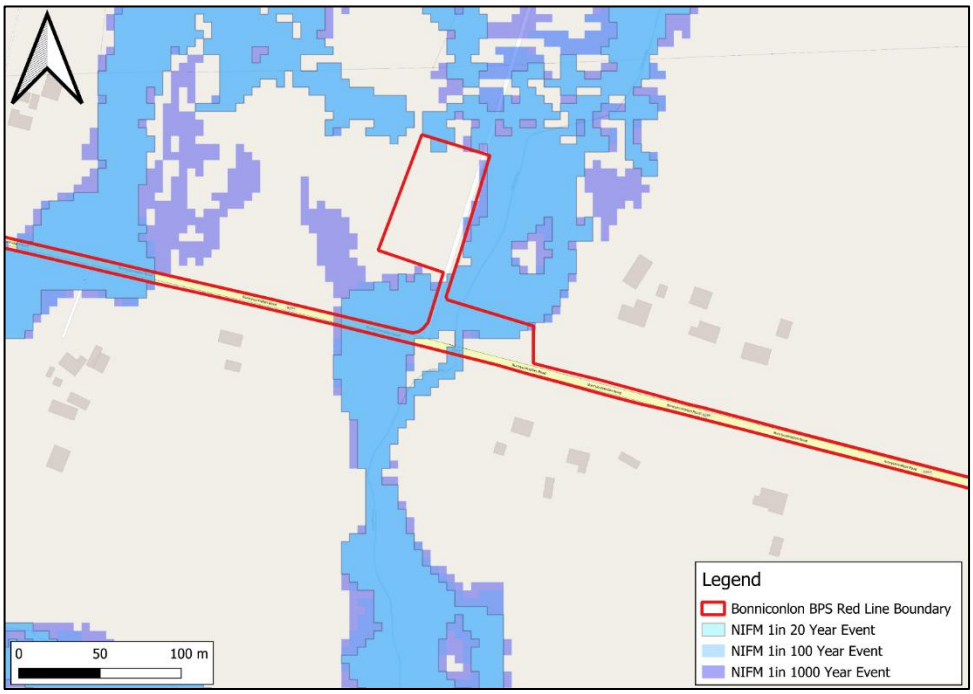


Figure 2-32 – Fluvial Flooding extents – Bonniconlon BPS

Coastal/Tidal Flood Risk

A review of the available coastal and tidal flood risk mapping has been undertaken for the Bonniconlon Booster Pumping Station (BPS) site, using the most up-to-date Office of Public Works (OPW) Catchment Flood Risk

Assessment and Management (CFRAM) datasets. These include the 0.5% Annual Exceedance Probability (AEP, or 200-year) and 0.1% AEP (1,000-year) coastal flood extents for present-day and future climate scenarios. As shown in the Figure 2-33, the Bonniconlon BPS is located approximately 15–20 kilometres inland from the nearest tidal waterbody or coastal margin. The mapped CFRAM coastal flood extents, both for current and projected future conditions, are restricted to low-lying coastal plains and tidal rivers along the north Mayo and Sligo coasts, and several subcatchments away from the site. There is no mapped coastal/tidal floodplain intersecting or approaching the Bonniconlon BPS site, nor are there any modelled corridors or tidal tributaries that could facilitate the inland propagation of tidal floodwaters toward the site. Local watercourses in the area, including the Srafaungal and Fiddaun Rivers, are non-tidal, with no hydraulic connectivity to the coast. The topography surrounding the BPS site consists of gently undulating land and local valleys, but there are no low-lying or depressional features that would serve as a pathway for tidal water intrusion under either present-day or future sea level rise scenarios. There is no hydraulic pathway for tidal or storm surge waters to propagate to the BPS site, either directly or via upstream river systems, under current or foreseeable climate change scenario. The site is well above any conceivable extreme coastal/tidal water level.

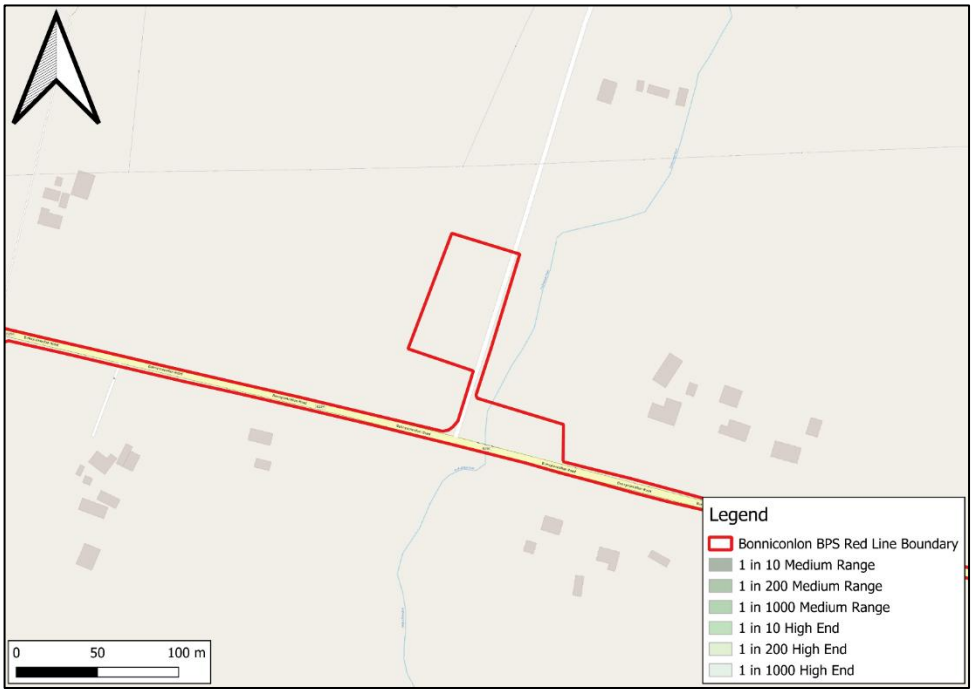


Figure 2-33 – Coastal / Tidal Flooding extents – Bonniconlon BPS

Groundwater Flood Risk

An assessment of groundwater flood risk for the Bonniconlon Booster Pumping Station (BPS) site has been completed using the most recent Geological Survey Ireland (GSI) datasets. These include the national mapping of maximum historic groundwater flooding (purple areas), surface water-groundwater flood interaction zones, and high-probability groundwater flood polygons, as well as GSI records of karst features, boreholes, and known groundwater discharge points. As depicted in the accompanying mapping (Figure 2-34), there are no mapped maximum historic groundwater flood polygons, high-probability groundwater flooding zones, or surface water–groundwater flood risk areas that intersect with the Bonniconlon BPS site or immediate surrounds. The closest mapped groundwater flood polygons are located several hundred metres to the north and southeast of the BPS, separated by intervening topography and local drainage divides. There is no evidence of groundwater flooding within, adjacent to, or upslope of the BPS, nor are there any mapped karstic features, sinkholes, or high-flow springs within the site area. The local topography, with the BPS constructed on gently sloping ground and elevated above the nearest depressions, further reduces the likelihood of any groundwater emergence or surface ponding during extreme recharge events.

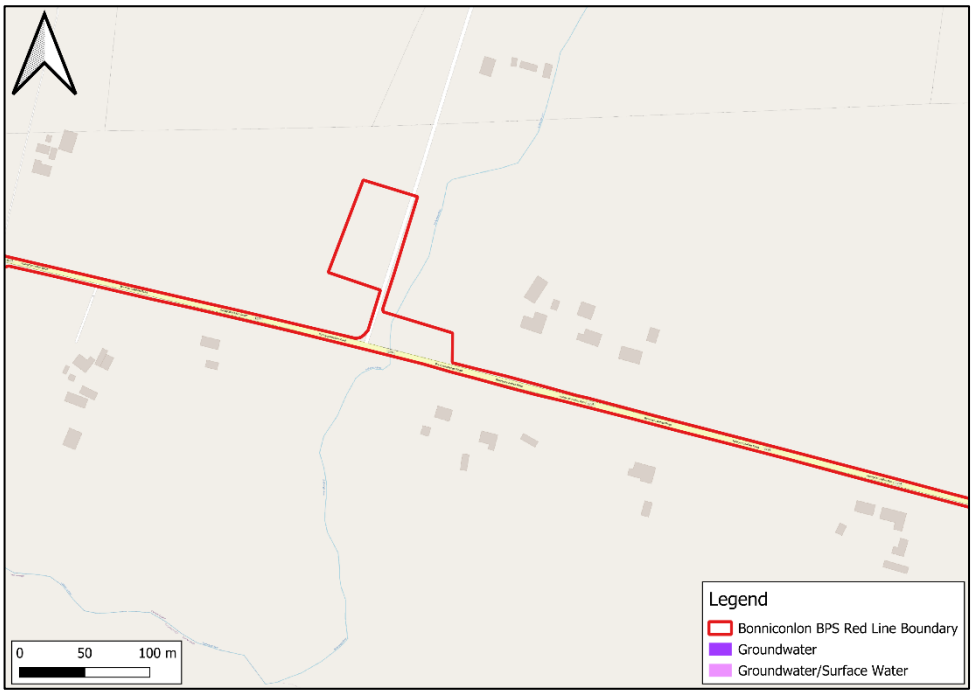


Figure 2-34 – Groundwater Flooding extents – Bonniconlon BPS

2.4.6 Historical Maps

Historic flood risk at the Bonniconlon Booster Pumping Station (BPS) site was assessed through a review of the Ordnance Survey Ireland (OSI) 6-inch and 25-inch historic mapping (see), accessed via the national mapping portal at https://geohive.ie (Figure 2-35 and Figure 2-36). These maps show the BPS site as well-drained agricultural land, with the Srafaungal Stream running along the eastern boundary. There are no indications of marsh, bog, or areas "liable to floods" within or immediately surrounding the site no such hatching, notation, or symbols appear on any edition reviewed. The surrounding field pattern and stream alignment have remained stable for over a century, and there are no mapped historic drainage issues or flood events. This historic mapping evidence, supported by OSI, confirms that the BPS site has a low baseline flood risk from past sources and has not been prone to flooding or persistent wet conditions.

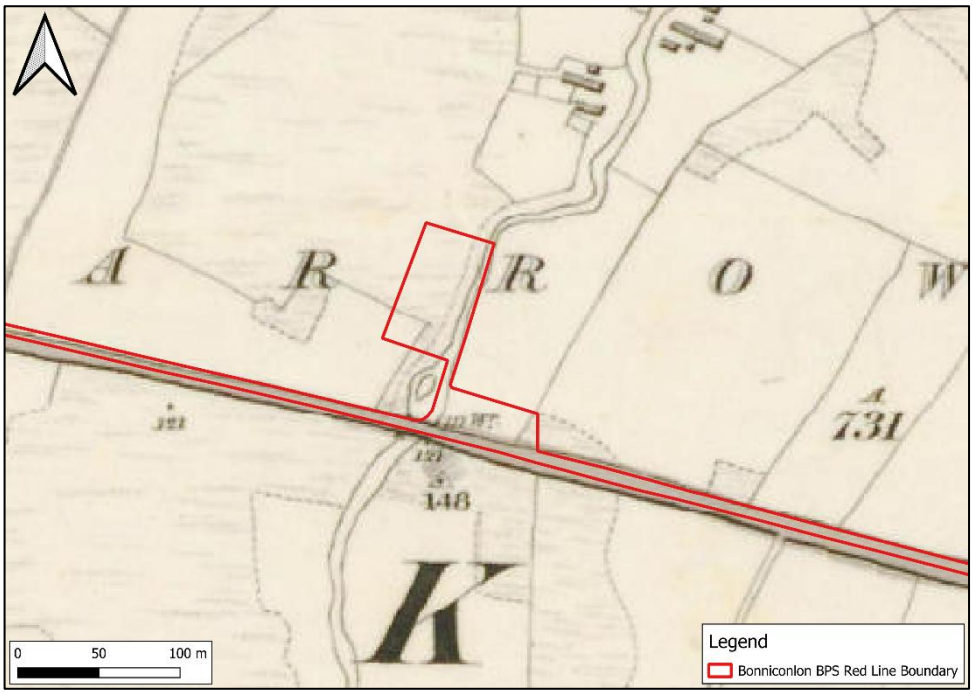


Figure 2-35 – OSI 6-inch Map – Bonniconlon BPS

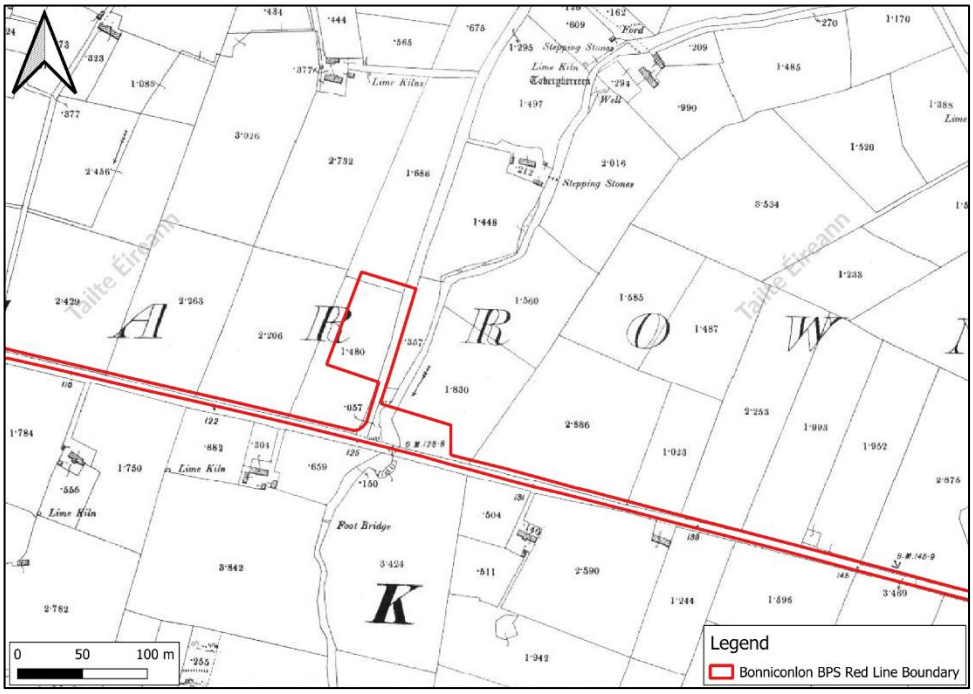


Figure 2-36 – OSI 25-inch Map – Bonniconlon BPS

2.4.7 Mayo County Development Plan 2022-2028

The Mayo County Development Plan 2022–2028 (https://www.mayo.ie/planning/county-development-plans/2022-2028) is the statutory land-use planning framework for all development within County Mayo. The Plan, together with its Strategic Flood Risk Assessment (SFRA – Volume 5), provides the local policy context for flood risk management, in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG,

2009). The SFRA was reviewed and observed that there was no data available for the area corresponding to Bonniconlon BPS site.

2.4.8 Conclusion

A Stage 1 Flood Risk Assessment (FRA) has been completed for the proposed Bonniconlon Booster Pumping Station (BPS) in accordance with the Planning System and Flood Risk Management Guidelines (DoEHLG/OPW, 2009), the Mayo County Development Plan 2022–2028, and its Strategic Flood Risk Assessment (SFRA). All relevant sources of flood risk, fluvial, pluvial, groundwater, coastal/tidal, artificial drainage, and historic, have been systematically screened using best available data, site surveys, and historic mapping. The assessment confirms that: The only mapped flood risk to the BPS site arises from the Srafaungal Stream, with the Flood Zone A and B extents skirting the site boundary affecting the eastern and southern periphery of the site. However, the flood zone does not extend into the site, as the site is elevated.

The site is not at risk from coastal or tidal flooding, groundwater emergence, or artificial drainage failures. There is no recorded history of flooding or wetland conditions on the site, as confirmed by historic mapping. The proposed development is classified as ‘water-compatible’ and is fully compliant with the sequential approach and all relevant national and County policies. Stage 1 for Bonniconlon BPS shall be concluded and no Stage 2/Stage 3 is required.

2.4.9 Recommendation

It is recommended that the development and ongoing operation of Bonniconlon Booster Pumping Station (BPS) proceed without the need for further (Stage 2 or 3) flood risk assessment or specific flood mitigation measures, other than standard good practice for site drainage and periodic maintenance of field drains. Continued adherence to Mayo County Development Plan policy on Sustainable Drainage Systems (SuDS) and site management will ensure ongoing resilience to local surface water during extreme rainfall. No additional flood risk management actions are warranted for this site.

2.5 Windy Gap Break Pressure Tank (BPT)

The Windy Gap Break Pressure Tank (BPT) site is sited in a remote upland landscape, approximately 2 km southeast of Drumsheen and Lough Talt, just south of the R294 in south County Mayo (Figure 2-37). It is a greenfield site and the wider area is rural in nature, comprising of areas of heavy overgrowth and areas of bogland. Access to the site is via an existing track off of the regional road, with no residential or commercial development in the immediate vicinity.

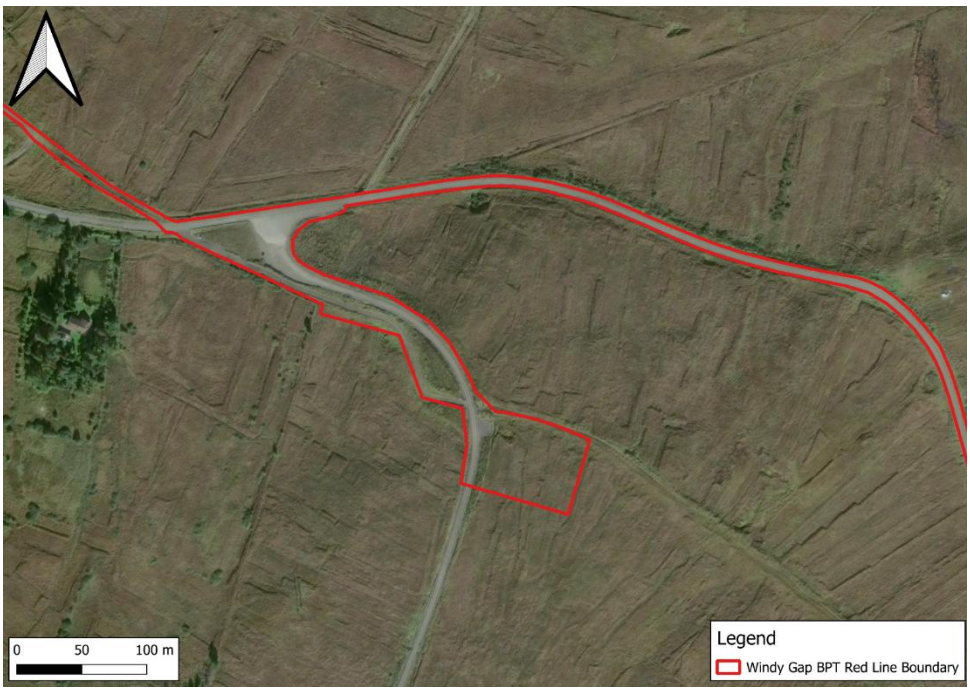


Figure 2-37 – Site Location – Windy Gap BPT

2.5.1 Topography

Analysis of the digital elevation model (DEM), topographic survey, and recent aerial imagery confirms that the Windy Gap BPT site is positioned on a subtle local high point within a broader, gently undulating upland landscape. The ground levels vary between 199 m OD and 214 m OD, ensuring robust separation from any local depressions or drainage pathways (Figure 2-38). The surrounding terrain is characterised by gentle to moderate slopes trending away from the site in all directions, supporting natural rainfall runoff toward distant low points and further buffering the site from any overland flow accumulation. No streams, rivers, or surface watercourses are present within or immediately adjacent to the boundary, and the local blanket peat and heather vegetation offer significant natural attenuation of rainfall and diffuse runoff.

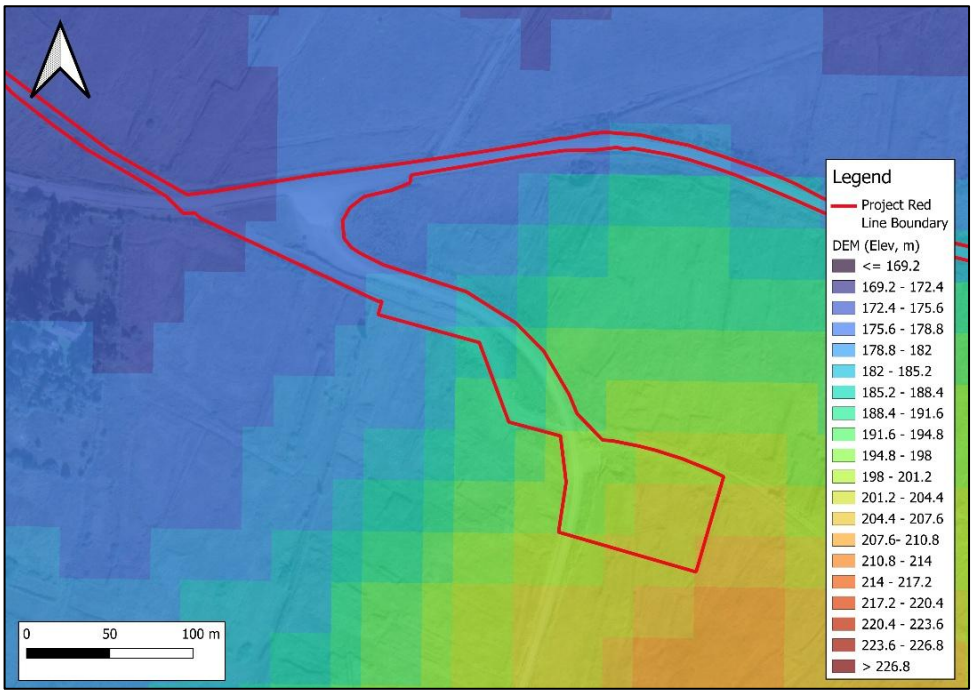


Figure 2-38 – Local Topography – Windy Gap BPT

2.5.2 Local Hydrology & Existing Drainage

The Windy Gap Break Pressure Tank (BPT) site is located in a rural landscape, within the Glenree_SC_010 sub-catchment (Figure 2-39). The map shows that the site is not adjacent to any major watercourse, with the nearest mapped stream channels (Glenree_34, Sraufaungal, Drumsheen) located at a significant distance from the BPT site. The drainage network in the immediate surroundings consists mainly of small, headwater streams and artificial forestry drains that follow the natural slopes away from the site. In addition, the nearest rivers are the Glenree River (to the east) and the Srafungal River (to the north and west), both of which are set well outside the site boundary and do not traverse or border the site. Within the local catchment, several small arterial drainage channels are shown, but none are in immediate proximity to the BPT site. The site is accessed by a private road / commonage with the nearest watercourses separated from the development by natural topography. There are no drainage channels or streams present on or adjacent to the BPT site. The combination of elevated terrain and separation from local rivers means that the site is not directly hydraulically connected to these watercourses. As such, the risk of direct fluvial inundation or overland flow from nearby streams is low. BPT occupies a location that is hydrologically isolated from major river networks and is buffered from direct drainage pathways by surrounding higher ground, significantly reducing the risk of localised flooding or drainage-related issues at the site.

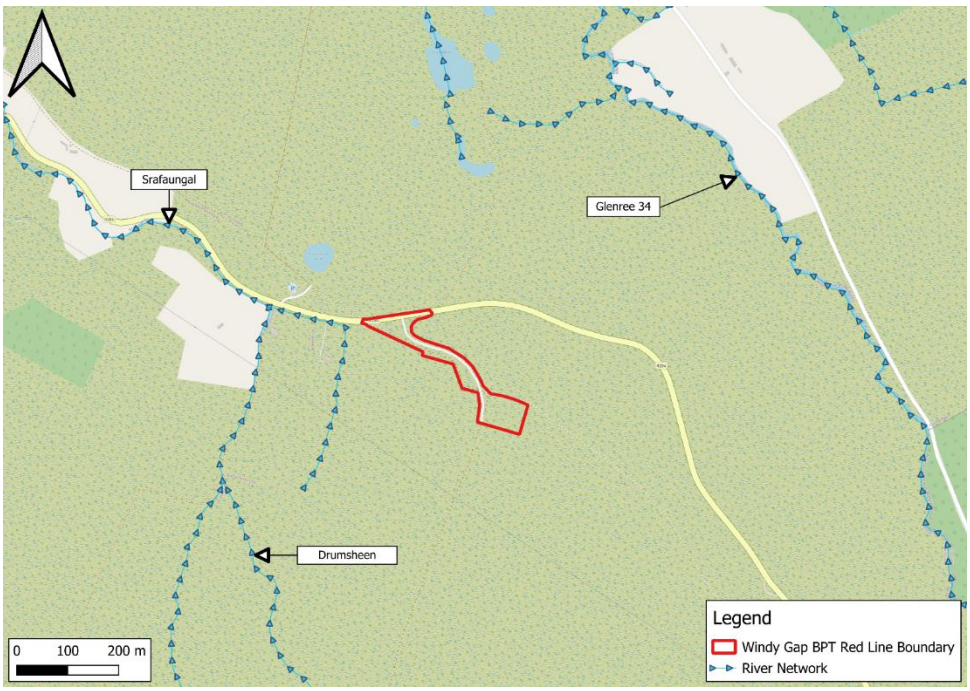


Figure 2-39 – Hydrological Features Map – Windy Gap BPT

2.5.3 Geological Survey of Ireland Mapping

The superficial deposits underlying the site include blanket peat, Till derived from granites and outcropping or shallow bedrock. The bedrock underlying the Windy Gap BPT site consists exclusively of Precambrian Quartzites, Gneisses, and Schists, as indicated by Figure 2-40. The entire site and its immediate surroundings are situated within this lithological unit, with no mapped transitions or contacts to other rock types present within or adjacent to the site boundary. These Precambrian rocks are generally hard, metamorphosed, and low in primary porosity, meaning they are typically resistant to weathering and have limited groundwater storage capacity. As a result, infiltration rates are low, and groundwater movement is usually restricted to fractures or fault zones, if present. The dominance of these stable and impermeable rocks supports the low groundwater flood risk for the site and further limits the potential for sub-surface water ingress or related flooding issues.

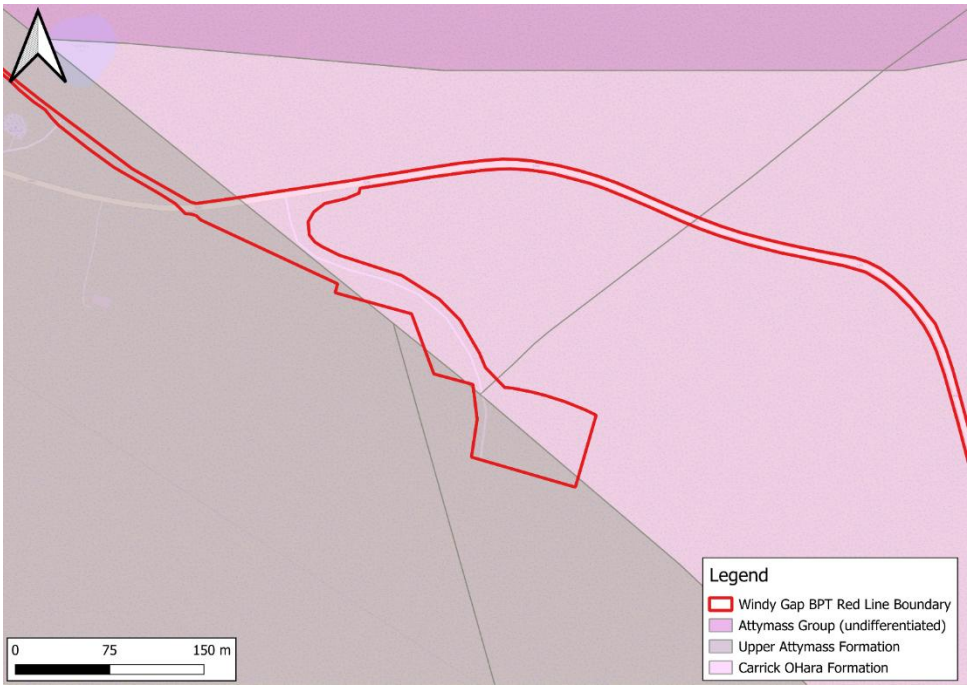


Figure 2-40 – GSI Bedrock Geology Map – Windy Gap BPT

2.5.4 Flood Risk Identification of the Site

In accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009), a Stage 1 Flood Risk Identification has been undertaken to establish whether any flooding or surface water management issues exist at Windy Gap Break Pressure Tank (BPT).

Table 2-5 Possible Flooding Mechanisms – Windy Gap BPT

Source/Pathway	Significant?	Comment/Reason
Coastal flooding	No	Upland site; >180 m OD, far inland from coast/tidal influence
Pluvial/Overland flow	No/Low	The site is gently sloping with direct drainage to local watercourses. No mapped pluvial risk, and no ponding or surface water issues observed.
Fluvial/River flooding	No	Distant from all CFRAM/NFIM mapped flood zones; no nearby watercourses with potential to cause overbank flooding.
Flooding from artificial drainage systems	No	There are no artificial or urban drainage systems on site. Minor field drains in adjacent agricultural land do not intersect the site.
Groundwater flooding	No	No GSI-mapped groundwater flood risk, turloughs, or groundwater/surface water flooding in or near the site.
Estuarial flooding	No	The site is far inland, with no tidal or estuarial flood influence.
Failure of infrastructure	No	No upstream hydraulic structures (dams, reservoirs, canals) that could pose a structural flood risk.

2.5.5 Flood Risk Investigation

2.5.5.1 OPW Flood Maps

A preliminary flood risk assessment has been undertaken for the proposed Windy Gap Break Pressure Tank (BPT) site, in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009). The assessment utilised both national and local flood mapping datasets, with particular emphasis on the OPW's CFRAM predictive flood extent layers (available at www.floodinfo.ie). For fluvial (river) flood risk, the CFRAM mapping for Flood Zone A (1% Annual Exceedance Probability [AEP], or 1-in-100-year) and Flood Zone B (0.1% AEP, or 1-in-1,000-year) were reviewed and overlaid on the site boundary.

Fluvial/River Flood Risk

A review of OPW CFRAM mapping, National Indicative Fluvial Mapping (NFIM), and historic flood events data was conducted for the Lough Talt Windy Gap Break Pressure Tank (BPT) site, in relation to the CFRAM 1% AEP (100-year) and 0.1% AEP (1,000-year) flood extents, the mapped river network, and past flood event locations (Figure 2-41). The nearest mapped river is the Glenree 34, located northeast of the BPT site. The CFRAM and NFIM flood zones for both the 1% and 0.1% AEP scenarios are tightly confined to the channel and low-lying land surrounding this watercourse. There is no overlap, encroachment, or even near proximity between these mapped floodplains and the BPT site boundary. The BPT site is sited on significantly higher ground, over 30 metres above the adjacent river floodplain, with intervening upland terrain and forest between the site and any mapped fluvial flood risk area. A review of OPW's mapped historic flood events confirms that no historic or recurring river flood incidents have been recorded at or near the BPT site. The closest mapped flood event is along the Glenree 34 channel, but at a substantial distance downslope and with no plausible overland flow route to the pumping station. Given the site's topographic separation, upland setting, and lack of direct or indirect connection to the nearest mapped river or its floodplain, the risk of fluvial (river) flooding to the Windy Gap BPT site is considered negligible.

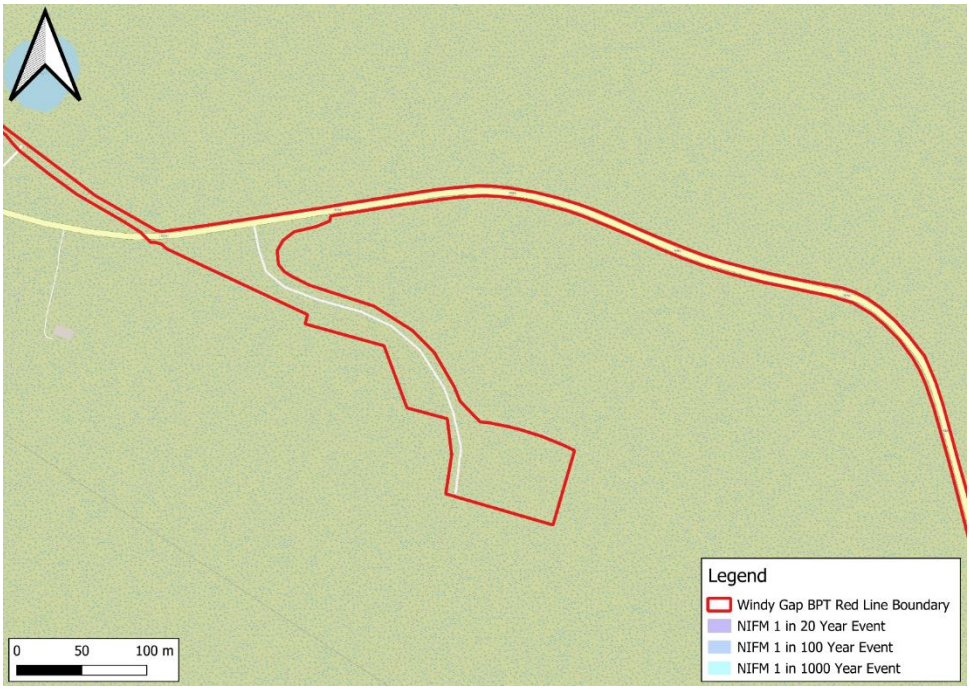


Figure 2-41 – Fluvial flooding extents – Windy Gap BPT

Coastal/Tidal Flood Risk

A detailed review of OPW CFRAM coastal flood mapping was undertaken for the Lough Talt-Windy Gap BPT site, including the 0.5% AEP (200-year) and 0.1% AEP (1,000-year) tidal flood extents. The Figure 2-42 shows the BPT location in relation to all modelled coastal flood zones and the regional river network. The BPT site is situated at a substantial distance from the nearest coastline or tidally influenced watercourse. The closest mapped CFRAM coastal flood extents are confined to low-lying coastal and estuarine areas far to the north and west, with no mapped coastal/tidal flood zones approaching or overlapping the BPT compound or its immediate catchment. The site's elevation, well above 185 metres OD, and its upland setting preclude any credible direct or indirect pathway for tidal waters to reach the compound, even under extreme climate change or storm surge scenarios. There is no topographic or river corridor connection between the site and any coastal or estuarine flood risk area. The only water features in the vicinity are upland streams and drainage ditches with no tidal influence. In summary, the Lough Talt BPT is entirely outside the influence of coastal or tidal flooding.

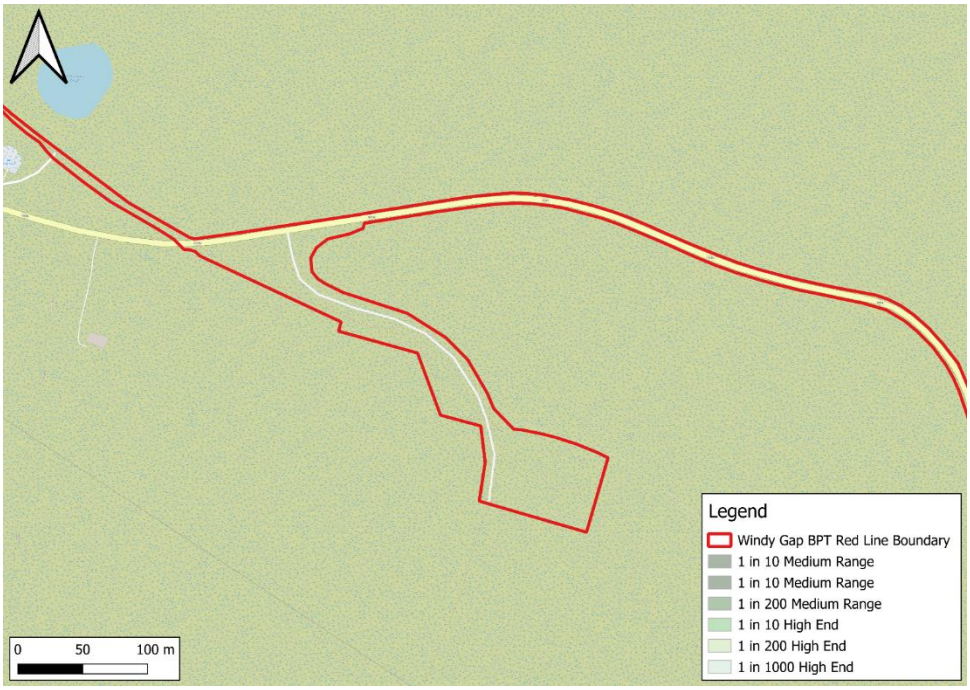


Figure 2-42 – Coastal / Tidal flooding extents – Windy Gap BPT

Groundwater Flood Risk

A review of Geological Survey Ireland (GSI) datasets for maximum historic groundwater flooding and high-probability groundwater flood risk confirms that the Lough Talt-Windy Gap BPT site and its immediate surroundings are not affected by any mapped groundwater flood polygons. The Figure 2-43 shows no maximum historic groundwater flooding or high-probability groundwater risk areas intersecting or near the BPT compound. There are no mapped turloughs, karst landforms, or springs present on or adjacent to the site. The BPT is situated on well-drained upland ground, far removed from low-lying areas typically susceptible to groundwater emergence. No groundwater-dependent wetlands, boreholes, or caves are indicated in proximity to the site. Further, there is no recorded history of groundwater flooding incidents or known local issues with groundwater emergence affecting this part of the Glenree_SC_010 subcatchment. In summary, the risk of groundwater flooding at the Windy gap BPT is considered negligible.

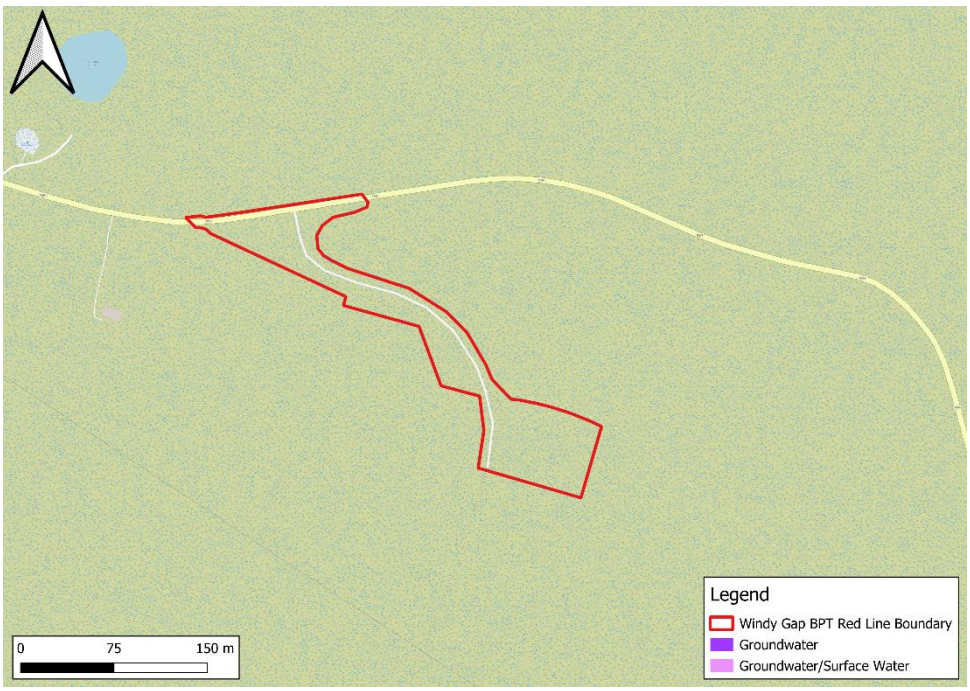


Figure 2-43 – Groundwater flooding extents – Windy Gap BPT

2.5.6 Historical Maps

A review of both the six-inch and twenty-five-inch historic Ordnance Survey maps (https://www.arcgis.com/apps/webappviewer/) was undertaken to assess any evidence of past flood events or drainage alterations at the Windy Gap Break Pressure Tank (BPT). The six-inch mapping (Figure 2-44) shows the site as undeveloped, with the surrounding area primarily comprising open moorland and forestry. No watercourses, drainage channels, or flood-related features are depicted within or adjacent to the BPT footprint, and there is no annotation or symbology indicating historic flood risk, waterlogging, or marshland within the proposed site boundary. The more detailed twenty-five-inch map (Figure 2-45) confirms the absence of historic flood features, field drains, or surface water accumulation in the immediate vicinity of the BPT. The mapped site and surrounding fields appear free from any topographic depressions or hydrological modifications that would typically indicate previous flooding or poor drainage. There is no historic evidence of flood-related issues, persistent wet ground, or land-use constraints associated with flooding at the BPT site based on available historic mapping. This further supports the conclusion that the site has a low susceptibility to flooding, consistent with the findings from current topographical, hydrological, and groundwater assessments.

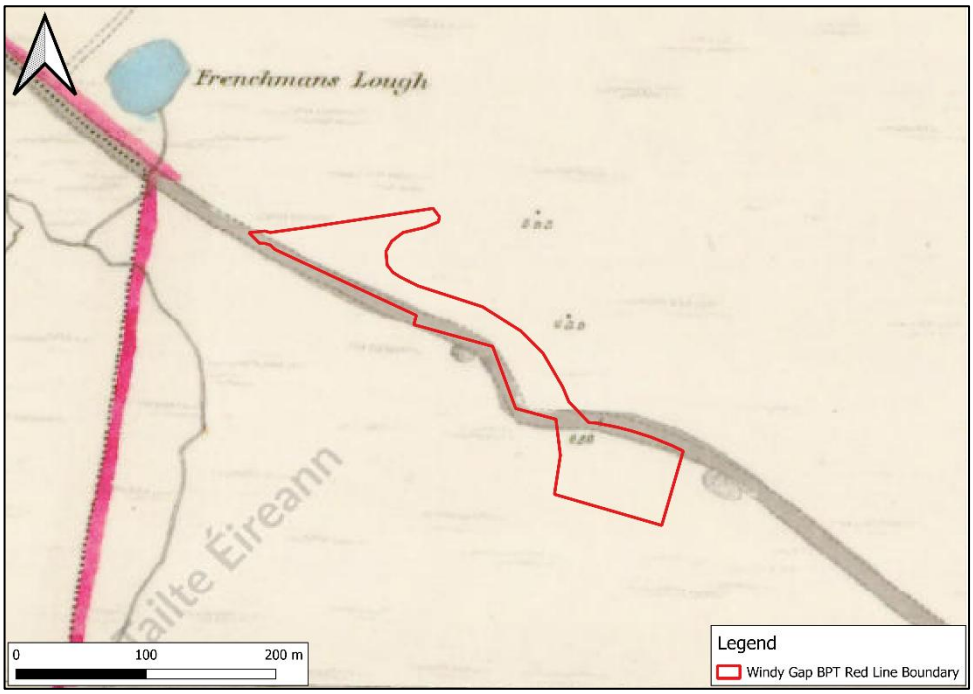


Figure 2-44 – OSI 6-inch Map – Windy Gap BPT

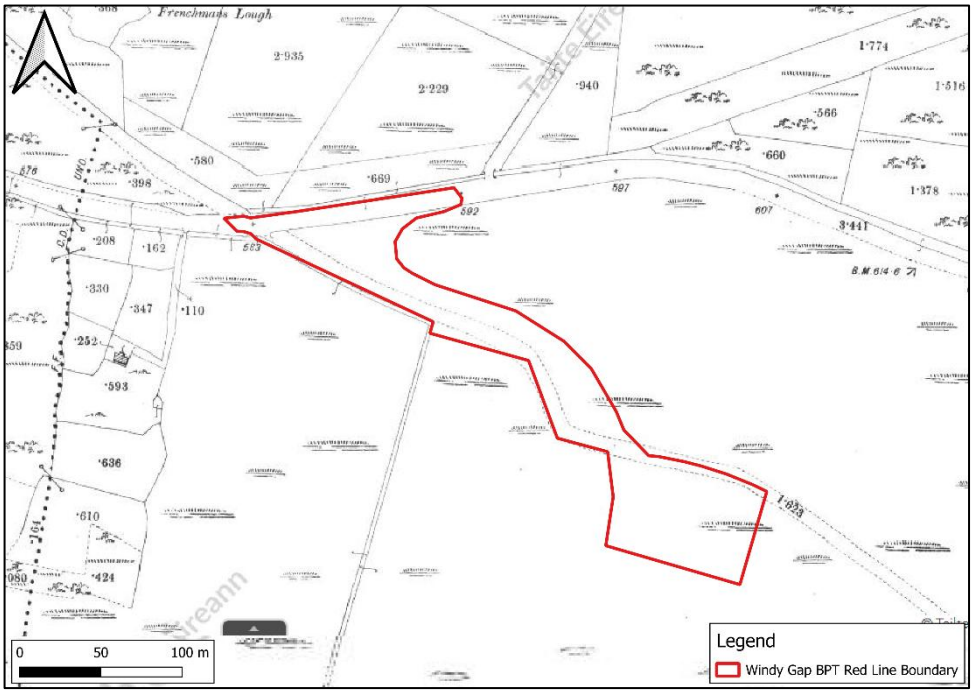


Figure 2-45 – OSI 25-inch Map – Windy Gap BPT

2.5.7 Mayo County Development Plan 2022-2028

The Mayo County Development Plan 2022–2028 (https://www.mayo.ie/planning/county-development-plans/2022-2028) is the statutory land-use planning framework for all development within County Mayo. The Plan, together with its Strategic Flood Risk Assessment (SFRA – Volume 5), provides the local policy context for flood risk management,

in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG, 2009). The SFRA was reviewed and observed that there was no data available for Drumsheen area.

2.5.8 Conclusion

A Stage 1 Flood Risk Assessment (FRA) has been completed for the proposed Windy Gap Break Pressure Tank (BPT) site in accordance with the Planning System and Flood Risk Management Guidelines (DoEHLG/OPW, 2009), the Mayo County Development Plan 2022–2028, and the accompanying Strategic Flood Risk Assessment (SFRA). All potential sources of flood risk—fluvial, coastal, pluvial, groundwater, artificial drainage, and historic—have been systematically screened using best available datasets, site topography, and historic mapping. The Windy Gap BPT is considered fully appropriate for development from a flood risk perspective. Stage 1 is concluded for Windy Gap Break Pressure Tank (BPT).

2.5.9 Recommendation

It is recommended that the ongoing operation and any proposed development at Windy Gap BPT site proceed without further (Stage 2 or 3) flood risk assessment or specific flood mitigation measures, beyond standard good practice in site drainage and maintenance. Continued adherence to Mayo County Development Plan requirements for Sustainable Drainage Systems (SuDS) and routine maintenance of on-site and local drainage infrastructure will ensure ongoing resilience to extreme rainfall events. No additional flood risk management actions are warranted for this site.

2.6 Lough Talt WTP

The Lough Talt Water Treatment Plant (WTP) is strategically located South of Lough Talt, immediately north of the R294 regional road and adjacent to the small settlement of Eighnagh in County Sligo (Figure 2-46). The site is accessed directly from the R294 and lies approximately 8 km west of Tubbercurry in a remote, largely undeveloped landscape characterised by peatland, forestry, and marginal pasture.

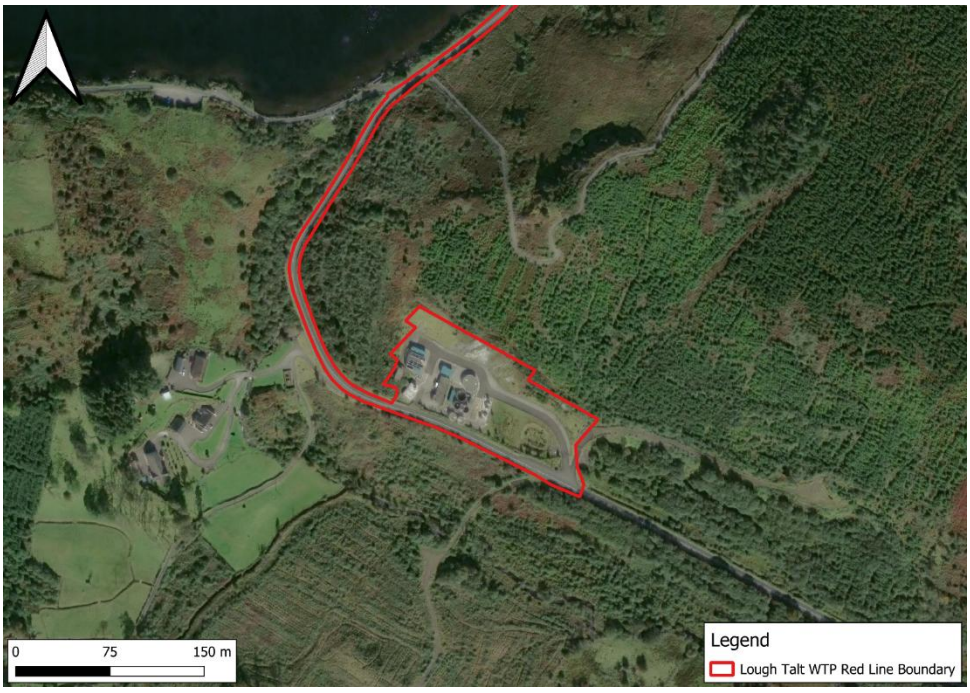


Figure 2-46 – Site Location – Lough Talt WTP

2.6.1 Topography

The topography at Lough Talt WTP is defined by its transitional position between the low-lying lakeshore and the gentle upland slopes rising to the south and east. Based on the provided topographic images and site layout (Figure 2-47), ground levels within the site generally range from approximately 125 m OD at the southern boundary to 157 m OD at the Northern boundary and about 110 m OD to the eastern boundary.

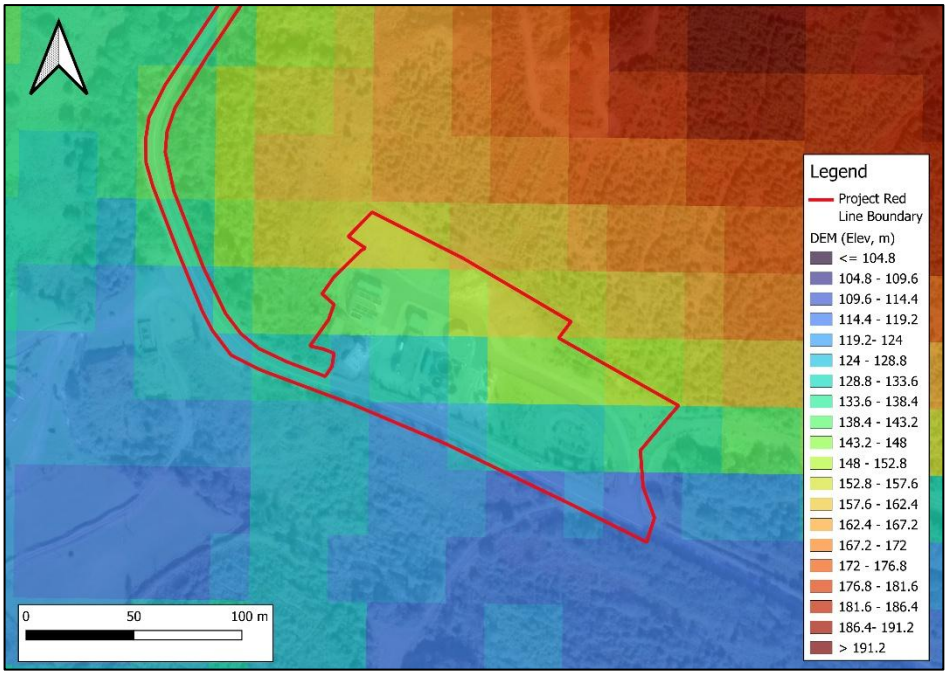


Figure 2-47 – Local Topography – Lough Talt WTP

2.6.2 Local Hydrology & Existing Drainage

Hydrologically, the Lough Talt WTP is immediately south of Lough Talt, a major upland lake and the source waterbody for the plant. The site is within the Moy_SC_020 subcatchment and is adjacent to the small stream outfall from Lough Talt, as mapped on your hydrographic figures (Figure 2-48). The closest significant water feature is Lough Talt itself, which forms the northern boundary of the WTP site. Other mapped streams, including the Eighnagh River (approximately 250 m, northwest), flow east and southeast of the plant but are separated from the site by the high ground. The site layout, including paved areas, attenuation ponds, and surface drainage infrastructure, is designed to manage surface water efficiently and prevent ponding within the site. Runoff from impermeable surfaces is directed to the attenuation pond, which drains into the existing outfall near the eastern corner of the site. The existing flow control device located downstream from the attenuation pond restricts the flow of surface water to pre-development runoff rate. This results in the surface water backing up and inundation of the attenuation pond, which is sized to cater for extreme rainfall events. The surrounding land is primarily rural, with a mix of grassland, scattered woodland, and managed agricultural fields. Drainage ditches and minor field drains are evident in the immediate area, providing additional pathways for overland flow during periods of heavy rainfall. Despite the proximity to the Eighnagh River, there is no evidence of direct hydraulic connectivity that would increase the risk of site flooding under normal conditions. Overall, the combination of site elevation, engineered drainage measures, and the local river network supports a well-managed hydrological setting, with a generally low risk of surface water accumulation or fluvial flooding affecting the WTP under typical conditions.

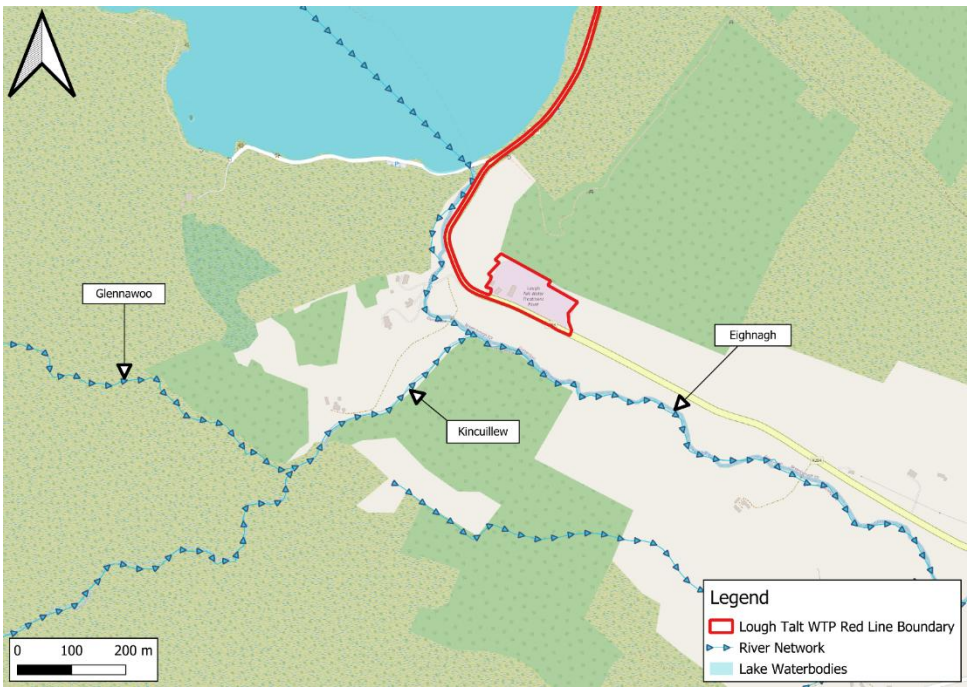


Figure 2-48 – Hydrological Features Map – Lough Talt WTP

2.6.3 Geological Survey of Ireland Mapping

The superficial deposits underlying the site are recorded as Till derived from metamorphic rocks, and outcropping or shallow bedrock. The bedrock underlying the site is recorded as schists, aluminous schist and pebble beds of the Meelick Member (Figure 2-49). GSI online mapping indicates the presence of faults north of the site which could result in fracturing within the site's bedrock, if the zone if influence of the faulting extends across the site. These rock types are characteristically hard, resistant rocks, typically associated with high permeability in fractured zones but generally low groundwater storage capacity in unfractured areas.

The presence of these metamorphic rocks contributes to the stable topography observed across the site, supporting well-drained soils and limiting the potential for groundwater emergence or persistent surface waterlogging. No evidence of karst features, significant faulting, or other geological hazards has been identified within the site boundary. Overall, solid geology provides a robust and stable foundation for the WTP, with no inherent geological risks likely to influence flood pathways or site development.

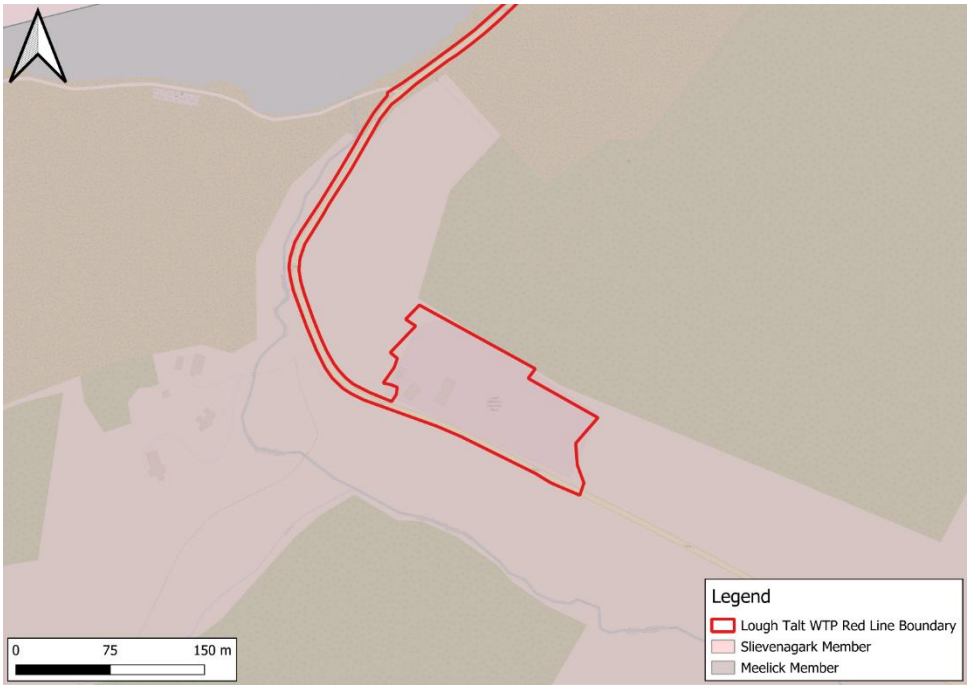


Figure 2-49 – GSI Bedrock Geology Map – Lough Talt WTP

2.6.4 Flood Risk Identification of the Site

In accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009), a Stage 1 Flood Risk Identification has been undertaken to establish whether any flooding or surface water management issues exist at Lough Talt WTP.

Table 2-6 Possible Flooding Mechanisms – Lough Talt WTP

Source/Pathway	Significant?	Comment/Reason
Coastal flooding	No	Far inland, upland lake, no coastal/tidal pathway
Pluvial/Overland flow	No/Low	Not mapped; moderate slopes; site drainage and attenuation pond
Fluvial/River flooding	No	Outside CFRAM/NFIM flood extents for lake/river; no past flood at site
Flooding from artificial drainage systems	No	There are no existing major artificial or urban drainage systems on site. Minor field drains in adjacent agricultural land do not intersect the site.
Groundwater flooding	No	No GSI-mapped groundwater flood risk, turloughs, or groundwater/surface water flooding in or near the site.
Estuarial flooding	No	The site is far inland, with no tidal or estuarial flood influence.
Failure of infrastructure	No	No upstream hydraulic structures (dams, reservoirs, canals) that could pose a structural flood risk.

2.6.5 Flood Risk Investigation

2.6.5.1 OPW Flood Maps

A preliminary flood risk assessment has been undertaken for Lough Talt WTP, in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009). The assessment utilised both national and local flood mapping datasets, with particular emphasis on the OPW's CFRAM predictive flood extent layers (available at www.floodinfo.ie). For fluvial (river) flood risk, the CFRAM mapping for Flood Zone A (1% Annual Exceedance Probability [AEP], or 1-in-100-year) and Flood Zone B (0.1% AEP, or 1-in-1,000-year) were reviewed and overlaid on the site boundary.

Fluvial/River Flood Risk

A review of OPW CFRAM mapping, National Indicative Fluvial Mapping (NFIM), and OPW historic flood event datasets (https://www.floodinfo.ie/map/floodmaps/), has been undertaken for the Lough Talt Water Treatment Plant (WTP). The fluvial risk map overlays the WTP site with CFRAM 1% AEP (100-year) and 0.1% AEP (1,000-year) river/lake flood extents, river networks, and past flood event records (Figure 2-50).

Lough Talt WTP is situated immediately south of Lough Talt, occupying an elevated position relative to the lakeshore and well above the mapped extents of both CFRAM and NFIM fluvial flood zones. The CFRAM and NFIM datasets clearly show that both the 1% and 0.1% AEP floodplains are confined to the immediate lake margin and adjacent low-lying ground, with no encroachment into the site. The nearest mapped fluvial risk features, associated with the Eighnagh River and local lake flooding, are separated from the WTP by significant topographic relief, with no plausible hydrological pathway linking mapped flood zones to the site. Since the site is outside of the maximum predicted flood extents, it is not at risk of fluvial flooding.

Historical flood event data was also reviewed, with several recurring events mapped at least 1,000 metres northwest of the site, primarily affecting the low-lying lands near Lough Talt's northern shoreline and the road infrastructure. The most recent significant event, recorded in 2005, was associated with lakeshore overtopping or drainage exceeding during periods of heavy rainfall. Supplementary flood hazard mapping reports for the wider Tobercurry area (including Lough Talt and townlands such as French Ford, Drumbaun, Ballinvally, and Gorteen Bridge) confirm that while flood events are a persistent risk in the region, the directly affected areas are remote from the WTP site and separated by both distance and local topography. No historic or modelled flood pathways extend to WTP. The site is situated at higher ground and does not have any direct hydrological connectivity with areas known to be at risk.

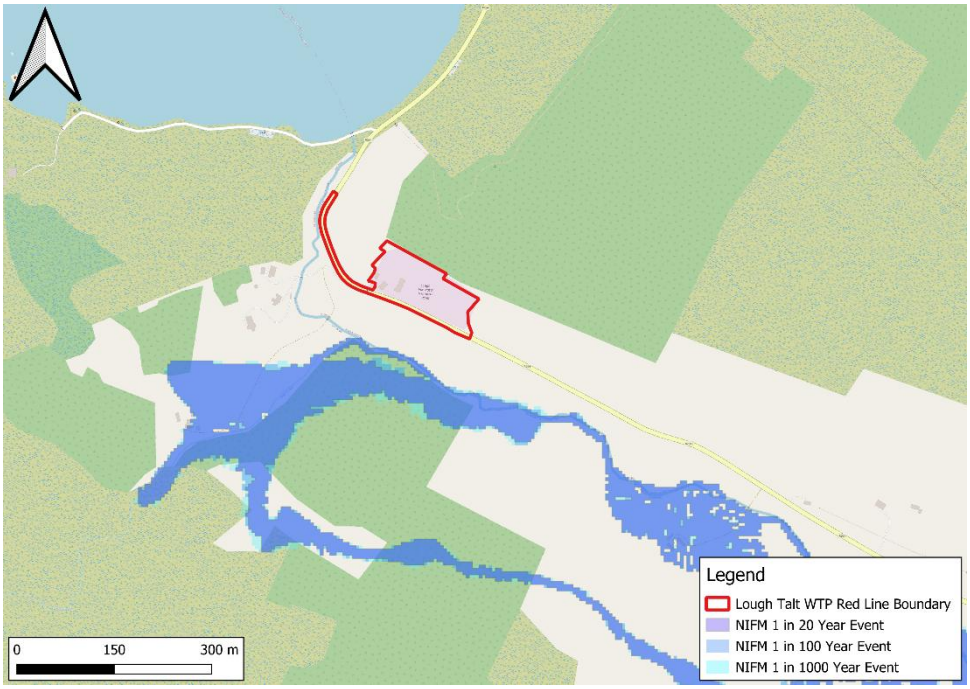


Figure 2-50 – Fluvial Flooding extents – Lough Talt WTP

Coastal/Tidal Flood Risk

A review of the OPW CFRAM coastal flood mapping has been completed for the Lough Talt Water Treatment Plant (WTP) site. The CFRAM 0.5% AEP (200-year) and 0.1% AEP (1,000-year) tidal flood extents are confined to the region's low-lying estuarine and coastal areas, which are located a significant distance downstream of the site (Figure 2-51).

The site is situated in an upland landscape at the southern shore of Lough Talt, approximately 130 metres above sea level and over 30 kilometres inland from the Atlantic coastline. This geographic context inherently removes any plausible exposure to coastal or tidal flood mechanisms. The map confirms that the WTP site or the surrounding landscape is not overlain by, or in proximity to, any mapped coastal or tidal flood zone. The site is situated on elevated ground adjacent to an upland freshwater lake, far inland and substantially above the influence of any tidal, coastal, or estuarine water levels. There is no conceivable hydrological or topographical pathway by which tidal waters could reach or impact the site, even under extreme climate change or storm surge conditions. Lough Talt WTP is entirely outside the area of influence of coastal or tidal flooding.

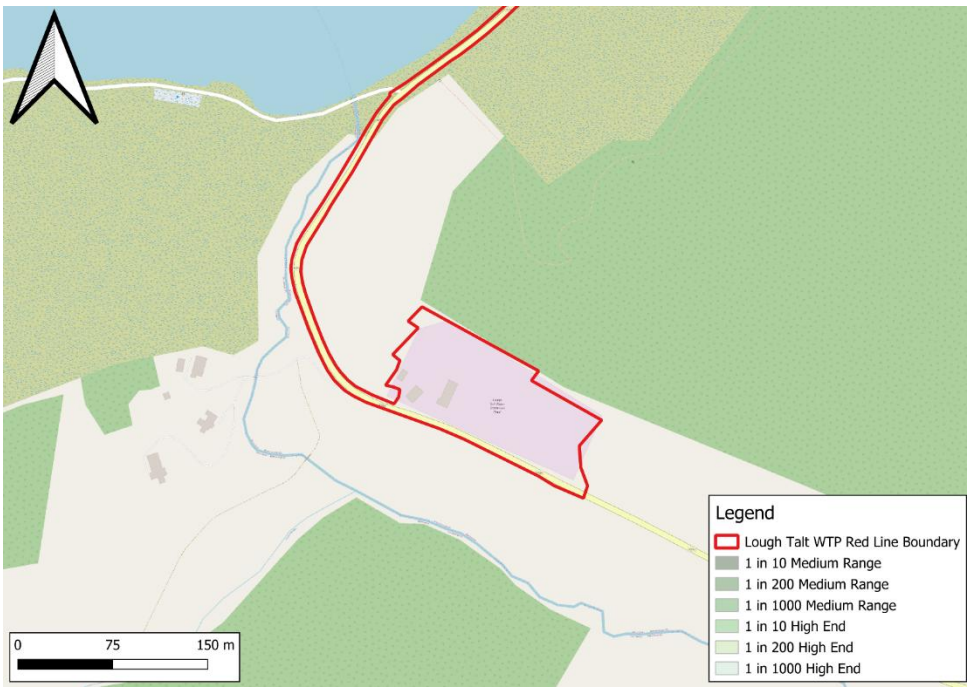


Figure 2-51 – Coastal / Tidal Flooding Extents – Lough Talt WTP

Groundwater Flood Risk

A review of Geological Survey Ireland (GSI) maximum historic groundwater flooding datasets, high-probability groundwater flood polygons, and relevant local hydrogeological mapping was undertaken for the Lough Talt Water Treatment Plant (WTP). The WTP site and its immediate surroundings do not intersect any mapped groundwater flood polygons. There are no recorded historic groundwater floods, high-probability groundwater risk areas, or mapped turloughs or karst features on or near the WTP site. The plant is sited on stable, moderately sloping ground above the southern shore of Lough Talt, and the regional geology is not indicative of widespread groundwater emergence, springs, or groundwater-dependent wetlands in the immediate area (Figure 2-52). No groundwater boreholes or GSI-mapped groundwater features are present at or adjacent to the compound. Further, the WTP is separated from the main lake margin by engineered site infrastructure and natural topography, further reducing the potential for groundwater upwelling or flood risk during periods of high lake or groundwater level. In summary, the risk of groundwater flooding at the Lough Talt WTP is considered negligible.

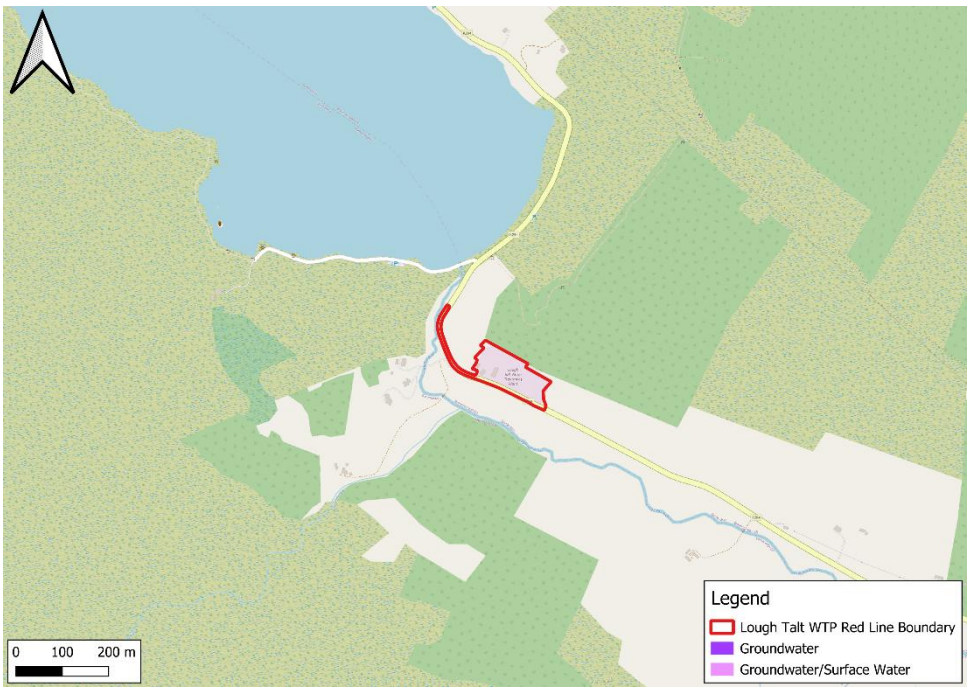


Figure 2-52 – Groundwater Flooding Extents – Lough Talt WTP

2.6.6 Historical Maps

A review of the historic Ordnance Survey Ireland (OSI) 6-inch and 25-inch mapping was undertaken for the Lough Talt Water Treatment Plant (WTP) site, using overlays sourced from the ArcGIS web viewer (https://www.arcgis.com/apps/webappviewer/). The OSI 6-inch map (Figure 2-53) depicts the Lough Talt WTP in a predominantly rural landscape, characterised by agricultural land, dispersed field boundaries, and established local tracks. The site is situated on gently sloping ground adjacent to the local road, with no evidence of mapped wetlands, persistent surface water, or marshy areas within or immediately surrounding the development footprint. The nearest significant watercourse, Lough Talt, is shown west and south of the site, but does not encroach on the WTP site. Importantly, there is no indication of recurring ponding, historic floodplain features, or local drainage issues either within or in the vicinity of the site. The OSI 25-inch mapping (Figure 2-54) provides increased cartographic detail and confirms the absence of mapped flood-prone land, persistent standing water, or marshy ground within the site boundary. The fields and parcels adjacent to the WTP are shown as well-drained and in active agricultural use, with minor drainage ditches reflecting routine land management practices rather than persistent wet conditions. No historic springs, wells, or groundwater emergence zones are recorded on or adjacent to the development area.

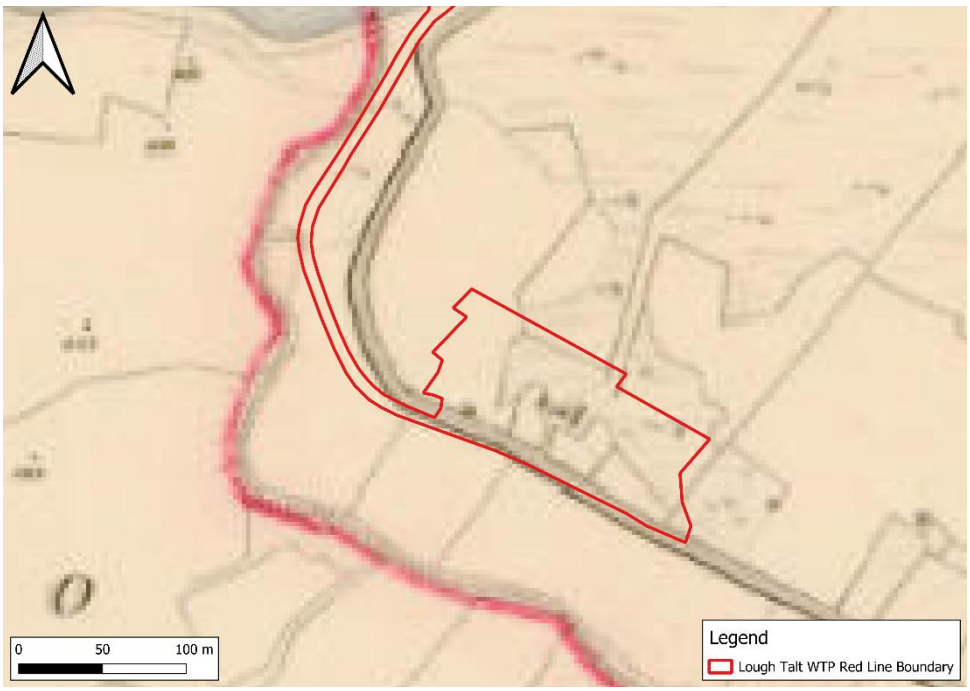


Figure 2-53 – OSI 6-inch Map Lough Talt WTP

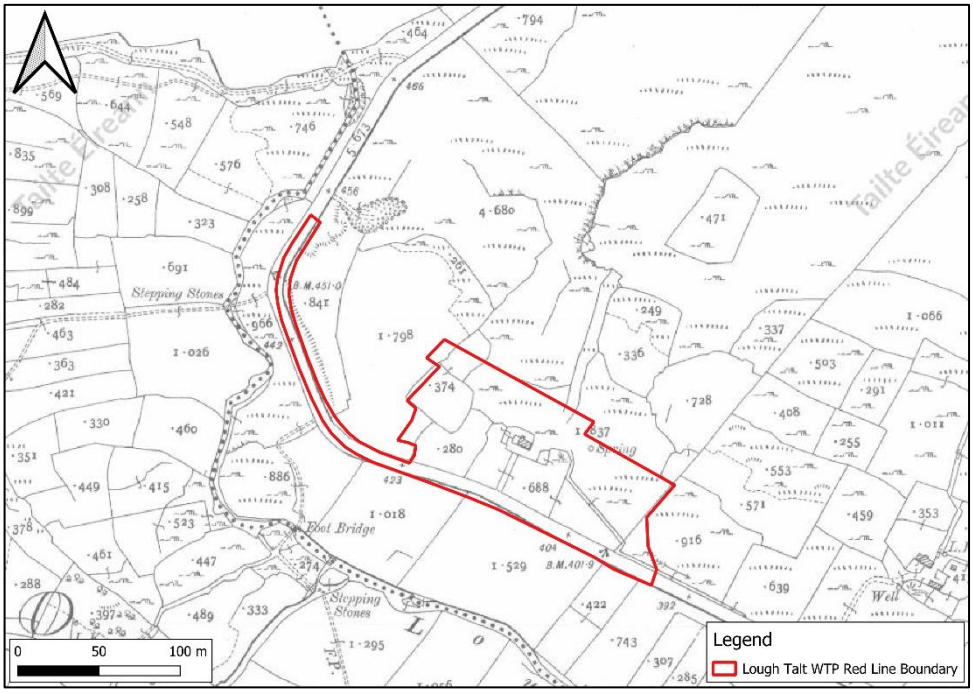


Figure 2-54 – OSI 25-inch Map Lough Talt WTP

2.6.7 Sligo County Development Plan 2024–2030

The Sligo County Development Plan 2024–2030 (Sligo CDP; Sligo County Development Plan 2024–2030 (Sligo CDP)), supported by its Strategic Flood Risk Assessment (SFRA, Appendix I), provides the statutory framework for managing land use and flood risk throughout County Sligo. In accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG/OPW, 2009), the Plan sets out a sequential, risk-based

approach to zoning and development, with a core objective of steering new development away from areas at significant risk of flooding, while accommodating essential infrastructure in lower-risk locations wherever possible. The SFRA for Sligo incorporates the latest available national predictive flood mapping, including OPW Catchment Flood Risk Assessment and Management (CFRAM) and National Indicative Fluvial Mapping (NIFM), under both present-day and high-end future climate scenarios (see Appendix 3 & 4). Flood risk zones are defined as follows:

- **Flood Zone A**: High probability of flooding (1% AEP fluvial or 0.5% AEP coastal
- **Flood Zone B**: Moderate probability of flooding (0.1–1% AEP fluvial or 0.1–0.5% AEP coastal)
- **Flood Zone C**: Low probability of flooding (all areas outside Zones A and B)

For the Lough Talt Water Treatment Plant (WTP), a review of the current Sligo SFRA and OPW flood mapping confirms that the entire WTP is situated within Flood Zone C (low probability of flooding). Neither the present-day nor future scenario flood extents for fluvial or coastal sources encroach on the WTP site. Accordingly, the proposed works at Lough Talt WTP are fully compatible with the Sligo County Development Plan 2024–2030 and SFRA policy. The location and design are consistent with the sequential approach and classification of 'water-compatible' infrastructure, requiring no further assessment or mitigation beyond standard best practice for surface water management and site drainage.

2.6.8 Conclusion

The Stage 1 Flood Risk Assessment for the Lough Talt Water Treatment Plant (WTP) has systematically reviewed all sources of flood risk, fluvial, coastal, groundwater, pluvial (surface water), and artificial drainage, using the most current OPW CFRAM and NIFM mapping, Sligo County Development Plan 2024–2030, SFRA datasets, and detailed site topographic and geological information. The site is unequivocally situated within Flood Zone C for all relevant flood mechanisms, lying entirely outside both Flood Zone A (high probability) and Flood Zone B (moderate probability) as defined by statutory mapping. No mapped or recorded flood events, groundwater emergence, or surface water management issues have been identified in the vicinity of the WTP. The Proposed Development is classified as "water-compatible development" and is fully compliant with the sequential approach set out in national and county policy. No justification or further assessment is required for this site. Stage 1 FRA is therefore concluded for the Lough Talt WTP.

2.6.9 Recommendation

It is recommended that the development of the repurposed Lough Talt WTP and its operation proceed without the need for Stage 2 or Stage 3 flood risk assessment, nor the requirement for specific flood mitigation measures beyond standard best practice in surface water drainage, site management, and maintenance. Ongoing adherence to Sligo County Development Plan and SFRA policy, including the application of Sustainable Drainage Systems (SuDS) and periodic review of on-site drainage infrastructure, will ensure continued resilience to localised surface water accumulation under extreme rainfall. No further flood risk management actions are warranted for this site.

2.7 Pipeline Corridor (Pipelines A to E)

The Proposed Pipeline Corridor consisting of Pipelines A to E is approximately 30.2 km long, and spans between Lisglennon Water Treatment Plant (WTP) in County Mayo and Lough Talt WTP in County Sligo (Figure 2-55).

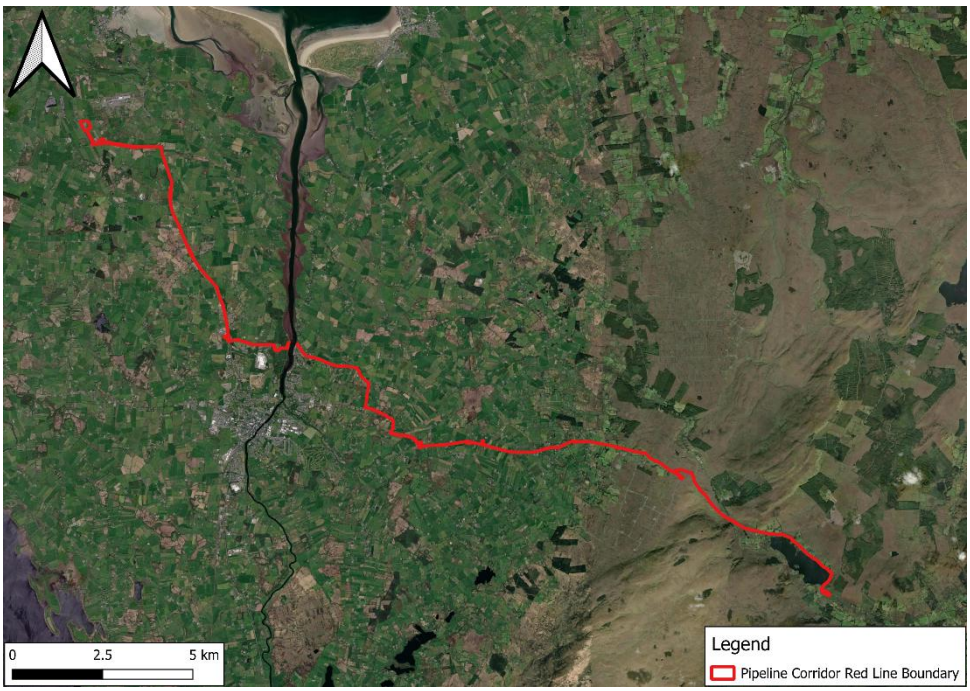


Figure 2-55 – Site Location – Pipeline Corridor

2.7.1 Topography

The topographic profile along the Pipeline Corridor is varied as shown in Figure 2-56. The Pipeline Corridor starts on low, gently undulating agricultural plains, with elevations between 40 metres above Ordnance Datum (m OD) and 65 m OD. The ground is well-drained, with wide fields, minor ridges, and shallow valleys supporting intensive pasture and arable use. It continues eastwards through relatively flat agricultural lands varying between 40 m OD and 52 m OD in elevation then turns south following the regional road R314 where elevations decrease gently towards Ballina down to approximately 30 m OD. At the R314 and Belleek Castle Road junction the Corridor follows the local road eastwards through slightly undulating ground descending towards the low-lying floodplain of the River Moy, with elevations dropping to the 30 – 1 m OD range.

East of the River Moy, the pipeline Corridor ascends from the river basin through a zone of gently rolling pasture and fragmented woodland. The topography is more variable, with local minor high points and troughs, but no steep gradients. As the main advances towards Lough Talt, elevations rise steadily, ultimately reaching over 200 m OD near the Windy Gap at the east and drops to approximately 125m at the Lough Talt WTP.

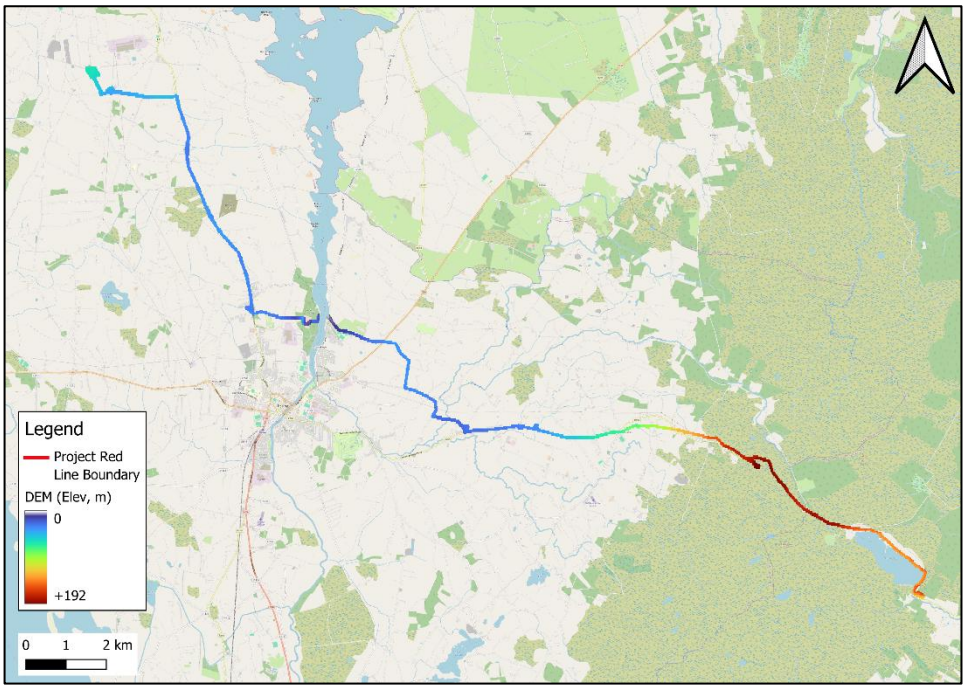


Figure 2-56 – Local Topography – Pipeline Corridor

2.7.2 Local Hydrology & Existing Drainage

The Pipeline Corridor from Lisglennon WTP to Lough Talt WTP is hydrologically diverse, intersecting multiple subcatchments of the wider River Moy system as well as smaller local streams and drainage features. The main river network and subcatchments are shown in Figure 2-57. From Lisglennon WTP, the pipeline corridor initially runs through a gently undulating agricultural landscape, with surface drainage patterns shaped by a network of minor field drains and shallow ditches. These contribute to the headwaters of several small streams which, in turn, flow northward toward Lough Conn or southeast toward the main Moy system. As the pipeline corridor progresses southeast, it enters the sphere of influence of the River Moy, the dominant hydrological feature of the region. The Moy is a substantial river draining much of north Mayo and western Sligo, with an extensive network of tributaries and floodplains. Approaching Ballina, the Pipeline Corridor is located just upstream of the Moy's major confluence with smaller streams such as the Bunree River, where drainage density increases, and connectivity to the Moy mainstem is direct. The local surface water regime here is characterised by both engineered drainage infrastructure and natural streams, with flow paths converging toward the broad, low-gradient floodplain at the heart of Ballina. Beyond Ballina, the pipeline corridor briefly aligns with the valley floor, closely paralleling the main channel of the River Moy. This section of the Pipeline Corridor is hydrologically sensitive, lying within or adjacent to the wider Moy floodplain and in proximity to active watercourses including the Knockanillaun and Glenree Streams. These streams, together with various artificial drainage ditches, reinforce the area's tendency to act as a hydrological convergence zone, with relatively slow-moving surface water and periods of high water table during wet weather.

East of the Moy valley, as the pipeline corridor traverses through the Bonniconlon area and continues toward Lough Talt, the hydrological context shifts again. The alignment here passes through a mosaic of small, steep-sided subcatchments, draining via short, flashy streams such as those of the Glenree and Srafaungal systems. Drainage patterns are more fragmented and rapid, with limited potential for persistent inundation, but the presence of shallow hollows and peat-rich soils may give rise to localised waterlogging after heavy rainfall. The final section of Pipeline Corridor at Lough Talt is near the upper reaches of the Glenree catchment, ultimately terminating near the lake margin. The Lough Talt WTP and immediate environs are located above the principal inflow/outflow streams, with surface drainage flowing naturally toward the lake basin. Throughout, the Pipeline Corridor interacts with a spectrum of hydrological settings, from the minor headwater channels and ditches of the north Mayo lowlands to the high-density

stream network and engineered drains of the Moy valley and Ballina, and onward to the more responsive upland subcatchments east of Bonniconlon.

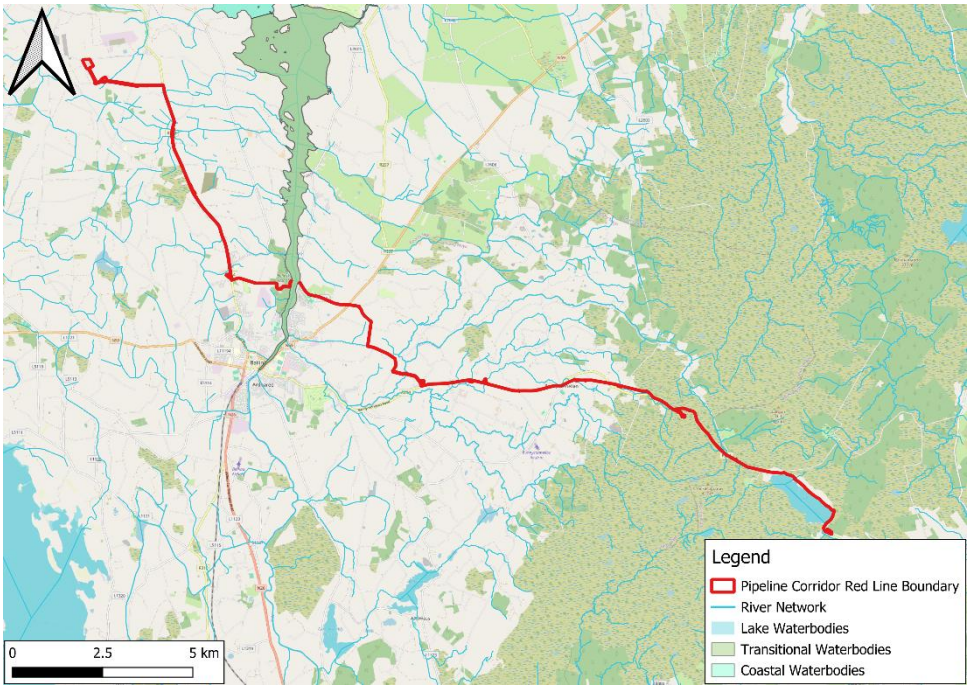


Figure 2-57 – Hydrological Features Map — Pipeline Corridor

2.7.3 Geological Survey of Ireland Mapping

The Pipeline Corridor crosses a geologically varied corridor, reflecting the changing bedrock and geomorphological context of north Mayo and west Sligo (Figure 2-58). Beginning at Lisglennon WTP, the pipeline corridor traverses an extensive lowland area underlain primarily by Ballina Limestone Formation (Lower). This bedrock unit provides generally stable ground conditions, is typically overlain by glacial till, and supports well-drained soils. The presence of this mixed lithology imparts moderate permeability and good structural support for below-ground works, with limited groundwater or stability issues expected. As the Corridor continues southeast toward Ballina, the underlying geology transitions to Ballina Limestone Formation (Upper), which dominate much of the Ballina region and the immediate Moy valley. Here, the terrain is characterised by gently rolling to flat ground, and the bedrock is frequently covered by glacial drift or alluvial deposits. These conditions provide a favourable substrate for trenching and asset installation, with generally low susceptibility to rapid groundwater movement or subsidence. Crossing the River Moy and proceeding eastwards, the Pipeline Corridor enters a corridor dominated by Ballina Limestone Formation (Upper). This section is slightly more variable in composition and is associated with locally thin soils and occasional karstic features. However, mapping does not indicate any significant turloughs or swallow holes along the corridor. Bedrock here remains competent. Further east, as the Pipeline Corridor passes through the uplands near Bonniconlon and approaches Lough Talt, the geological character changes distinctly. The Corridor traverses small outcrops of Granites and other Igneous Intrusive Rocks and then enters the area of Precambrian Marbles and, finally, the extensive Precambrian Quartzites, Gneisses, and Schists that define the Ox Mountains and Lough Talt catchment. These older metamorphic rocks, encountered in the final approach to Lough Talt WTP, are typically associated with rugged relief, thin soils, and increased surface drainage, but also offer highly stable ground. At Lough Talt WTP the ground is made of solid bedrock, with no recorded geotechnical hazards or problematic soils.

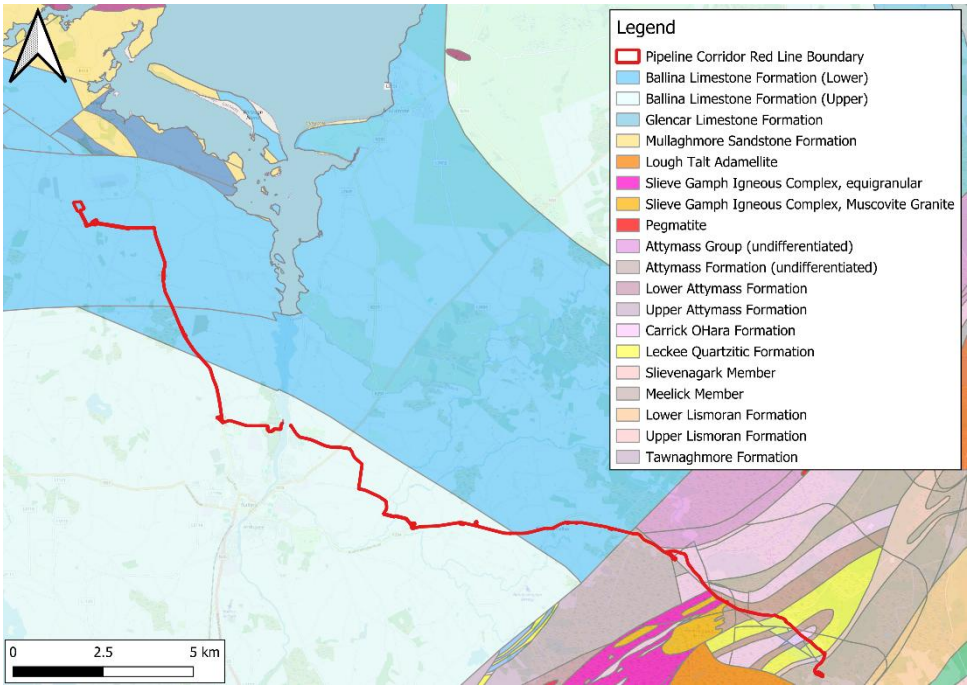


Figure 2-58 – GSI Bedrock Geology Map – Pipeline Corridor

2.7.4 Flood Risk Identification of the Site

In accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009), a Stage 1 Flood Risk Identification has been undertaken to establish whether any flooding or surface water management issues exist at Proposed Pipeline Corridor.

Table 2-7 Possible Flooding Mechanisms – Pipeline Corridor

Source/Pathway	Significant?	Comment/Reason
Coastal flooding	Yes	A section of Pipeline C, (Creggs Road) is within CFRAM-mapped 1:200 and 1:1000-year tidal/estuarial flood extents. All other sections are well inland or upstream of coastal influence
Overland flow	No/Low	No PFRA pluvial flood hazard mapped along Pipeline Corridor; local drainage manageable by standard design.
Fluvial/River flooding	Yes	A section of Pipeline C, (Creggs Road) is within CFRAM Flood Zone A (fluvial). All other sections are outside river flood zones.
Flooding from artificial drainage systems	No	No known history or mapped risk of surcharging drains or culverts affecting pipeline or assets
Groundwater flooding	No	GSI mapping confirms that Pipeline Corridor are outside high probability groundwater flood polygons and away from turloughs/springs. No historic groundwater flood records for any site.
Estuarial flooding	Yes	A section of Pipeline C, (Creggs Road) may be affected by combined tidal/fluvial surges at the upper estuary of the River Moy. This is the only location where estuarial/tidal influence is mapped as significant.

Source/Pathway	Significant?	Comment/Reason
Failure of infrastructure	No	No history of dam/reservoir or major asset failure in zone; standard construction precautions apply.

2.7.5 Flood Risk Investigation

2.7.5.1 OPW Flood Maps

A preliminary flood risk assessment has been undertaken for the Proposed Pipeline Corridor, in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009). The assessment utilised both national and local flood mapping datasets, with particular emphasis on the OPW's CFRAM predictive flood extent layers (available at www.floodinfo.ie). The fluvial flood risk has been assessed using the most recent OPW Catchment Flood Risk Assessment and Management (CFRAM) maps, the National Indicative Fluvial Mapping (NFIM). Flood Zone A (1% Annual Exceedance Probability [AEP], or 100-year event) and Flood Zone B (0.1% AEP, or 1,000-year event) have been identified for all significant watercourses, with particular attention paid to areas where the pipeline corridor interface with modelled floodplains and CFRAM Flood Nodes Map (Figure 2-59).

Fluvial/River Flood Risk

A review of the fluvial (lake) flood risk at Proposed Pipeline Corridor has been undertaken using OPW's Catchment Flood Risk Assessment and Management (CFRAM) maps, National Indicative Fluvial Mapping (NFIM), and historic flood event record (Figure 2-59).

The section of pipeline corridor from Lisglennon WTP to Ballina is within low-lying but well-drained farmland, outside all mapped fluvial flood extents. Both national datasets and flood maps confirm that this section is remote from any significant watercourse or valley floor. The section of the Pipeline Corridor near Ballina is just outside the mapped boundary of the River Moy's Flood Zone A, and do not intersect any modelled 1% AEP floodplain.

The central pipeline corridor through Ballina and the River Moy valley exhibits the greatest fluvial risk exposure. CFRAM mapping confirms an extensive 1% AEP floodplain in this reach. A section of Pipeline C (Creggs Road) is located within Flood Zone A, as shown on the CFRAM detailed flood extent (Figure 2-60). According to CFRAM the 1% AEP flood water level is **3.0 m OD** with a maximum predicted water depth of **0.29 m** above site ground level (2.71 m OD). There were occurrences of past flood events in the vicinity of this location. The proposed works within this section of Pipeline Corridor comprises of buried pipelines and sealed underground chambers and the proposed development is "water compatible".

East of Ballina, the pipeline traverses upland terrain, entirely outside any CFRAM-mapped Flood Zone A or B. This section of the pipeline Corridor is not exposed to mapped fluvial flood risk, with topography and stream profiles confirming a low likelihood of channel overflow or floodplain interaction.

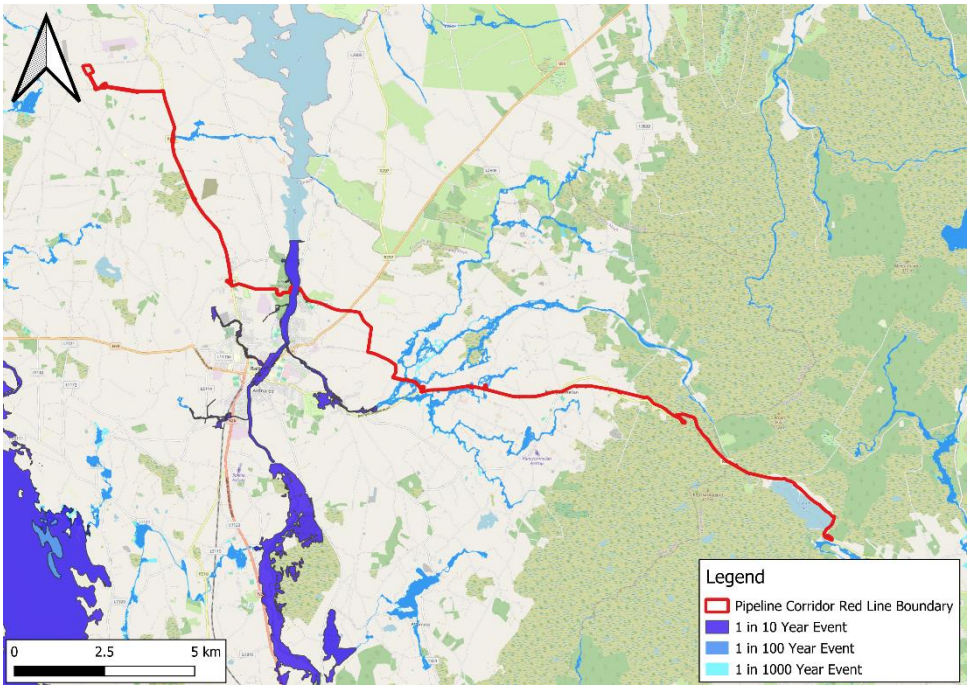


Figure 2-59 – Fluvial Flooding extents – Pipeline Corridor



Figure 2-60 – Flood level at Creggs Road

Coastal (Tidal) Flood Risk

The potential for coastal or tidal flooding along the Pipeline Corridor has been systematically assessed using the latest OPW CFRAM coastal flood mapping, including both the 0.5% AEP (200-year) and 0.1% AEP (1,000-year) flood zones (Figure 2-61). This review specifically addresses the possible influence of tidal or estuarine waters, with a focus on the River Moy's lower reach and its connection to Killala Bay.

Analysis of the CFRAM coastal flood maps confirms that initial section of pipeline corridor between Lisglennon WTP and Ballina, is not within or adjacent to any mapped coastal flood zone under either current or future sea-level rise scenarios. Ground levels are consistently above extreme tide thresholds for the region. Approaching Ballina the Pipeline Corridor is located on slightly lower ground; however, the tidal reach of the River Moy dissipates well downstream of Ballina town centre. Both the national and detailed CFRAM extents confirm that tidal or estuarine flooding does not extend to this section and this section of pipeline corridor is fully outside the mapped area of coastal/tidal influence.

Within Ballina and across the Moy valley, the route passes through a zone where fluvial and tidal influences converge. A detailed review of the CFRAM coastal mapping demonstrates that a section of Pipeline C (Creggs Road) is directly affected by mapped coastal flood risk. The location is included within both the 0.5% AEP and 0.1% AEP CFRAM coastal flood extents, reflecting its position adjacent to the tidal reach of the River Moy. Here, extreme coastal water levels—driven by tide and storm surge—can combine with high fluvial flows to flood the low-lying ground.

The remaining section of the Pipeline Corridor is well beyond the spatial extent of any mapped coastal or tidal floodplain, with ground levels and site elevations providing an effective buffer against high-end climate-adjusted sea level scenarios.

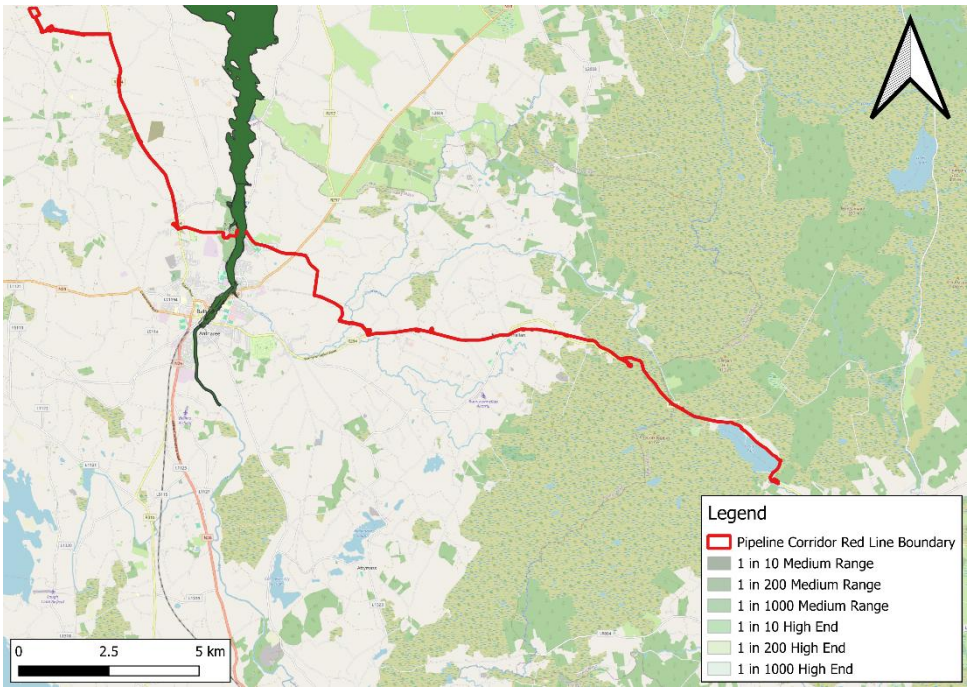


Figure 2-61 – Costal / Tidal Flooding extents – Pipeline Corridor

Groundwater Flood Risk

Groundwater flood risk for the Pipeline Corridor has been assessed using Geological Survey Ireland (GSI) national groundwater flood mapping, incorporating both the Maximum Historic Groundwater Flood datasets and GSI karst landform inventories. The review specifically considers the presence of turloughs, shallow groundwater tables, historic groundwater flooding, and potential interaction with major springs along the Pipeline Corridor (Figure 2-62).

According to GSI mapping, the section of Pipeline Corridor from Lisglennon WTP till Ballina, is characterised by a moderate depth of groundwater, and there are no mapped turloughs, no GSI high-probability groundwater flood polygons, and no significant springs. The Maximum Historic Groundwater Flood data confirm an absence of groundwater flooding records near the alignment. While occasional field drains and shallow perched water tables may

occur after prolonged rainfall, the risk of sustained or deep groundwater emergence is negligible for this western section of the Pipeline Corridor.

Within the Ballina area and adjacent Moy valley, the pipeline corridor is outside any mapped high-probability groundwater flood polygons. While the lower Moy valley can experience a high water table due to both fluvial and groundwater interactions, GSI flood maps and karst inventories confirm there are no recorded turloughs, major springs, or significant historic groundwater flooding in the immediate vicinity of the Pipeline Corridor.

The GSI mapping shows an absence of high-probability groundwater flood polygons along the remaining section of pipeline Corridor till Lough Talt WTP. No turloughs, major karst features, or shallow springs are mapped along the corridor. The upland setting, combined with thin soils and rapid drainage, further reduces the risk of groundwater flooding.

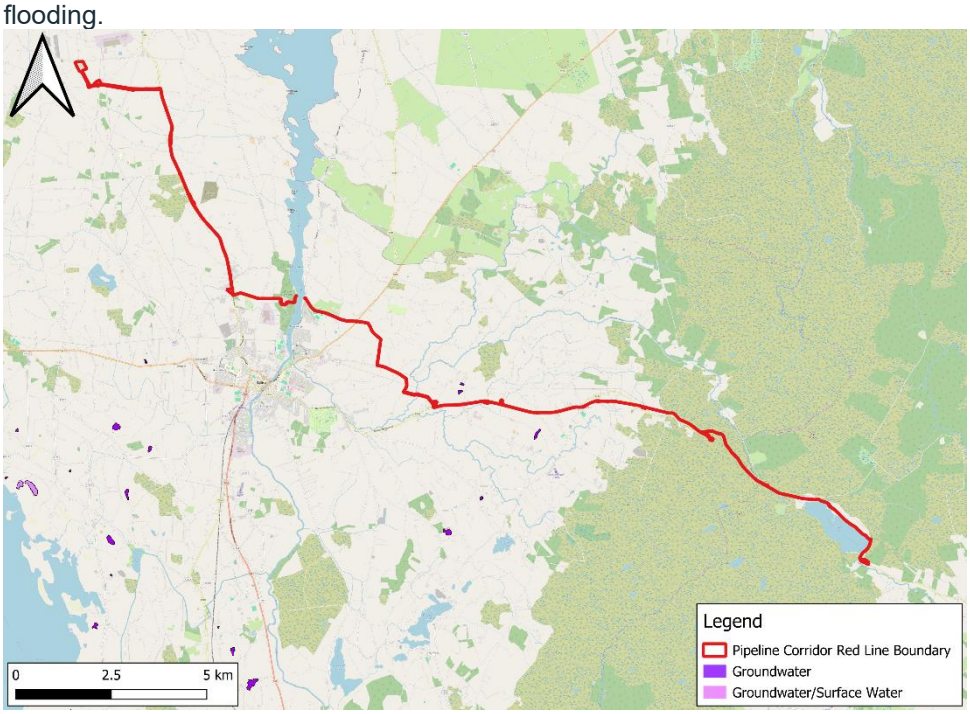


Figure 2-62 – Groundwater flooding extents – Pipeline Corridor

2.7.6 Historical Maps

A review of the historic Ordnance Survey Ireland (OSI) 6-inch and 25-inch mapping was undertaken for Proposed Pipeline Corridor, using overlays sourced from the ArcGIS web viewer (https://www.arcgis.com/apps/webappviewer/). The 6- inch map (Figure 2-63), which provide the most detailed historic cartographic record available for this region, have been examined to identify any legacy floodplain features, historic watercourses, wetlands, drainage ditches, or recorded flood events that might indicate long-standing or recurrent flood risk. The historic mapping confirms that the vast majority of the route traverses well-drained agricultural land, upland pasture, and modest valley floors, with no evidence of historic floodplain encroachment or significant wetland presence along the proposed pipeline Corridor. The 6-inch mapping clearly depicts the major watercourses and floodplain areas in the Ballina/Moy Valley section, with a section of Pipeline C (Creggs Road) located within the floodplain of the River Moy, as was indicated by CFRAM and flood zone mapping. All remaining sections of the Pipeline Corridor are positioned outside of mapped historic wetlands or areas historically prone to flooding. The historic mapping review therefore provides strong supplementary evidence that, except for the known floodplain at Creggs Road, the Pipeline Corridor have no legacy of recorded flooding, marshland, or drainage constraints. This supports the conclusions of the site-specific flood risk assessment based on contemporary OPW and county-level data.

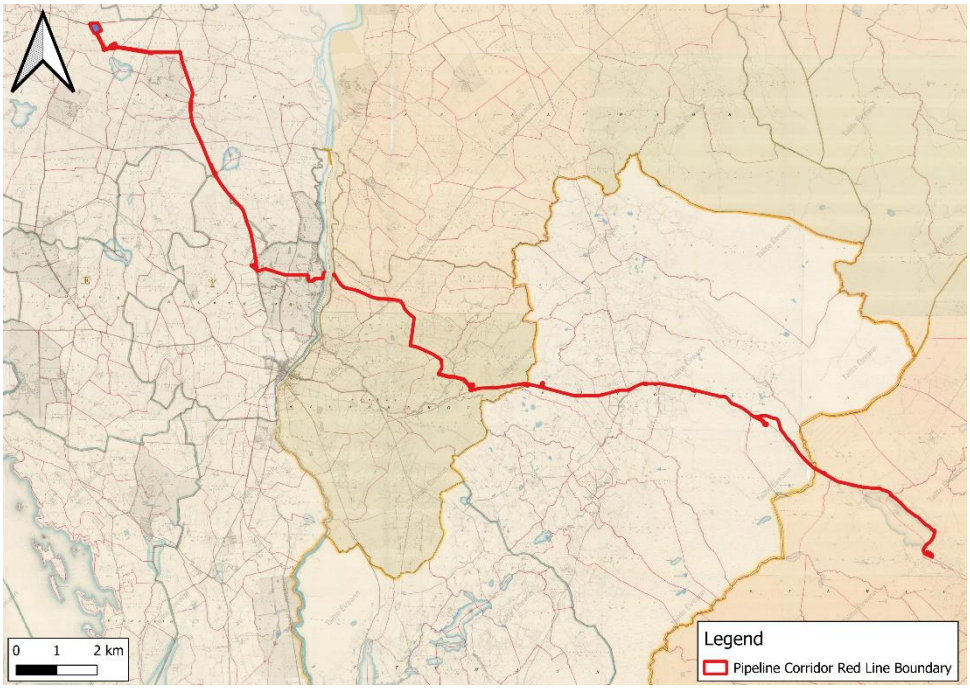


Figure 2-63 – OSI 6-inch Map – Pipeline Corridor

2.7.7 Mayo and Sligo County Development Plan Policy Compliance

The proposed Lisglennon to Lough Talt Water Supply pipeline and associated infrastructure have been rigorously reviewed for compliance with the Mayo County Development Plan 2022–2028 (including its Strategic Flood Risk Assessment, SFRA; https://www.mayo.ie/planning/county-development-plans/2022-2028 and the Sligo County Development Plan 2024–2030 (with SFRA; Sligo County Development Plan 2024–2030 (Sligo CDP)), in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG/OPW, 2009). Both county plans apply a risk-based, sequential approach to development, requiring essential infrastructure to be sited away from areas of significant flood risk wherever feasible, and subject to robust assessment and mitigation where unavoidable.

Flood Zones are defined as:

- **Zone A**: High probability of flooding (≥1% AEP fluvial or ≥0.5% AEP coastal/tidal)
- **Zone B**: Moderate probability (0.1–1% AEP fluvial or 0.1–0.5% AEP coastal/tidal)
- **Zone C**: Low probability (all areas outside Zones A/B)

The Proposed Pipeline Corridor is classed as water-compatible utility infrastructure, permissible in all flood zones under both county SFRAs and the Planning Guidelines, provided construction does not obstruct natural flood flows or reduce floodplain storage.

- **County Mayo**: The pipeline alignment is predominantly within Flood Zone C, with isolated, short section of Pipeline C at Creggs Road, crossing Zones A/B as confirmed by SFRA and GIS mapping. These crossings are operationally essential, and residual risk is negligible due to the below-ground, reinstated nature of the works.

- **County Sligo**: The pipeline and Lough Talt WTP are entirely within Flood Zone C, with no above-ground assets in mapped flood risk areas. Standard best-practice construction and surface water management are sufficient.

2.7.8 Conclusion

This Stage 1 Flood Risk Assessment has comprehensively evaluated the proposed Pipeline Corridor referencing the latest OPW flood mapping, national and county planning policy, and all relevant technical guidance and standards. The assessment has systematically addressed fluvial, coastal/tidal, and groundwater flood risks—alongside local geology and hydrology for the pipeline corridor.

The pipeline is a buried, water-compatible utility, extending from Lisglennon WTP in County Mayo through the Ballina environs and eastward toward Lough Talt WTP in County Sligo. Along its entire alignment, the pipeline is reinstated to original ground level, does not obstruct flood flows, and maintains floodplain storage. It is compliant with both Mayo and Sligo County Development Plans, their respective SFRAs, and the Planning System and Flood Risk Management Guidelines for Planning Authorities.

Most of the Pipeline Corridor, including all rural, peri-urban, and upland sites, are located outside mapped Flood Zone A and B, fully within Flood Zone C, and thus outside any significant flood risk. For these sections, standard best-practice design, drainage, and surface water management are sufficient and fully meet all planning and policy requirements.

A section of Pipeline C (Creggs Road) is located within CFRAM-mapped Flood Zone A (1% AEP fluvial) and also within the 0.5% and 0.1% AEP coastal/estuarial flood envelopes. Detailed investigation confirm a 1% AEP flood level of 3.0 m OD at this location. In line with Uisce Éireann and OPW requirements, all proposed works within this section of Pipeline Corridor will be flood-resistant and sealed, water compatible buried pipelines and underground chambers, with minimum need of operational and maintenance requirements.

In summary, the pipeline corridor have been demonstrated to be fully compliant with all relevant statutory policies, guidelines, and codes of practice. The proposed design and mitigation measures address all identified flood risks and stakeholder expectations. There is no requirement for Stage 2 FRA for the Proposed Pipeline Corridor, as all risks are appropriately managed at Stage 1.

2.7.9 Recommendation

This Stage 1 FRA is considered complete, and no further (Stage 2 or 3) flood risk assessment is required for any pipeline corridor, as the proposed design and mitigation measures fully address all identified risks.

All works should continue to apply the relevant Uisce Éireann (Irish Water) Codes of Practice, Mayo and Sligo County Development Plan policies, and the Planning System and Flood Risk Management Guidelines throughout detailed design, construction, and operation.

For most of the Pipeline Corridor, maintain standard best-practice construction and drainage (including Sustainable Drainage Systems [SuDS]), robust reinstatement, and regular site maintenance.

For a section of Pipeline C (Creggs Road), ensure that the proposed underground infrastructure is water compatible, flood-resilient and compliant with the latest Irish Water and OPW standards.

2.8 Bonniconlon Reservoir

The Bonniconlon Reservoir site is located in a rural setting just west of the village of Bonniconlon, County Mayo, and is accessed directly from the L51172 Bonniconlon West local road (Figure 2-64). The site sits immediately south of the road, surrounded primarily by agricultural grassland and low-density rural housing.



Figure 2-64 – Site Location – Bonniconlon Reservoir

2.8.1 Topography

The topography at the Bonniconlon Reservoir site is typical of this region of north County Mayo, with gently rolling pastureland with gradual elevation changes. According to the digital elevation model (Figure 2-65), site elevations range from approximately 90 m OD at the road frontage, gently rising to above 98 m OD at the western and southern margins of the compound. There are no depressions, low-lying areas, or hydrologically connected drainage features that would pose a risk of surface water accumulation or overland flow. The gently sloping, well-drained terrain ensures that the site is outside any potential flood or drainage pathways.

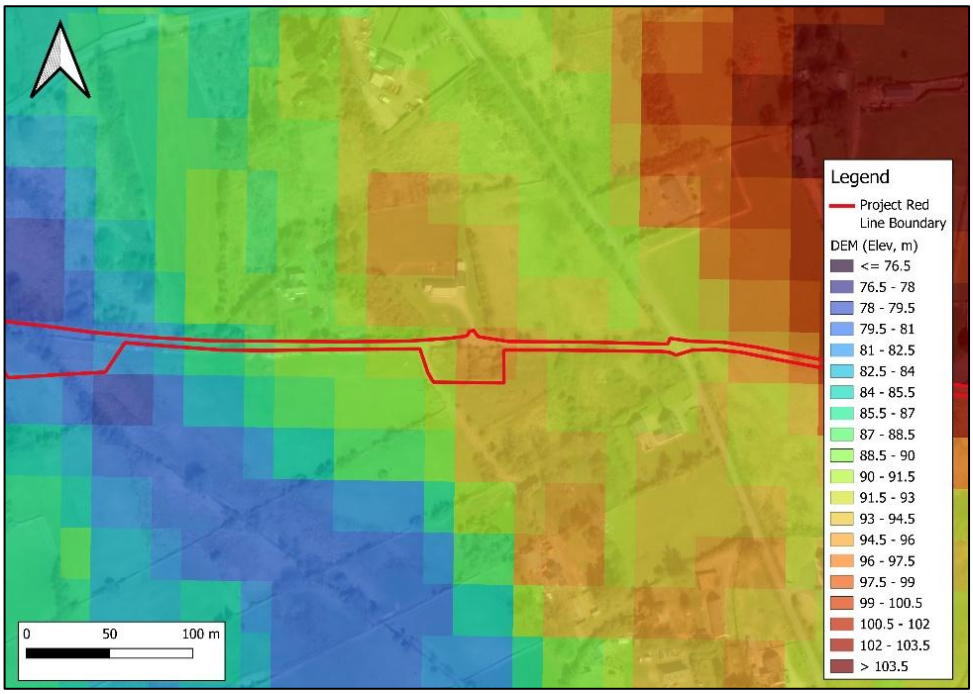


Figure 2-65 – Local Topography – Bonniconlon Reservoir

2.8.2 Local Hydrology & Existing Drainage

Hydrologically, the Bonniconlon Reservoir site is within the Glenree_SC_010 subcatchment, as shown by your mapping. The site is not adjacent to a main river or significant watercourse. The nearest water feature is a small stream (part of the local river network) running southwest of the site, located approximately 100–150 metres away at its closest point, following the natural drainage line through Bonniconlon West (Figure 2-66). Local surface drainage is mainly managed by these minor streams and artificial field drains, typical of the agricultural landscape in this region. No streams or drainage ditches cross or border the site. There are no mapped wetlands, turloughs, groundwater emergence points, or alluvial soils on or adjacent to the site. The surrounding area is well-drained and does not show evidence of persistent ponding or surface water issues. The site is therefore considered to have a low inherent risk of hydrological flooding.



Figure 2-66 – Hydrological Features Map – Bonniconlon Reservoir

2.8.3 Geological Survey of Ireland Mapping

The Bonniconlon Reservoir site is underlain by Ballina Limestone Formation (Lower), as indicated by the Geological Survey Ireland bedrock mapping (Figure 2-67). These limestone formations are typical of the region and are generally characterised by moderate permeability and stable ground conditions. The geology map shows no evidence of karstic features, such as sinkholes or swallow holes, nor any mapped springs or groundwater emergence points within or adjacent to the site. The absence of highly fissured or fractured bedrock, turloughs, or groundwater-dependent ecosystems in this locality further reduces the risk of groundwater flooding or unpredictable subsurface water movement. Overall, the geological setting supports the interpretation of a well-drained site with low susceptibility to both groundwater flooding and foundation instability.

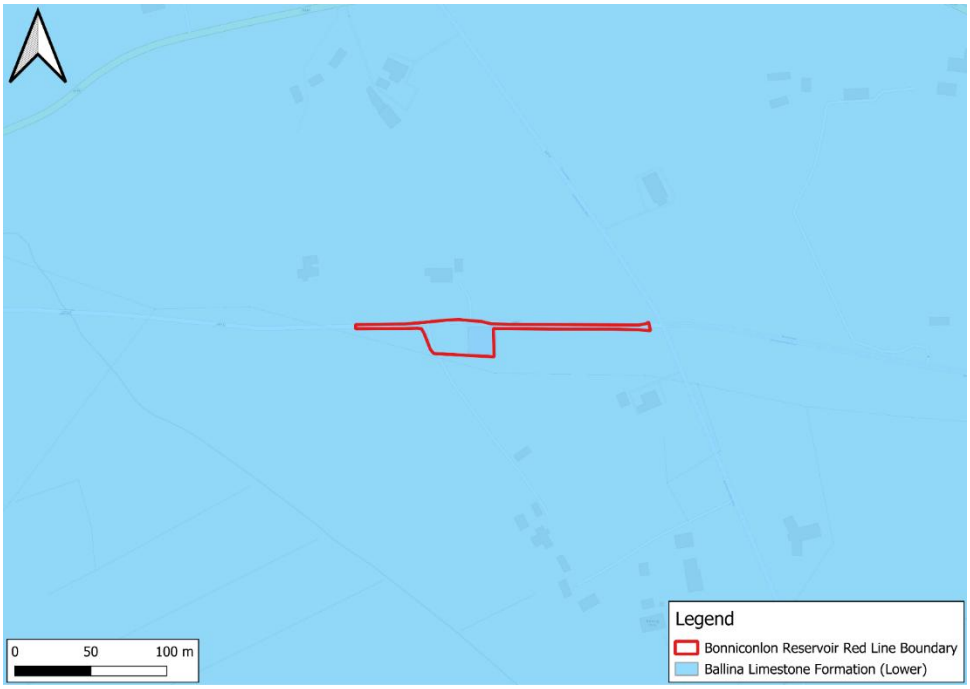


Figure 2-67 – GSI Bedrock Geology Map – Bonniconlon Reservoir

2.8.4 Flood Risk Identification of the Site

In accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009), a Stage 1 Flood Risk Identification has been undertaken to establish whether any flooding or surface water management issues exist at Bonniconlon Reservoir site.

Table 2-8 Possible Flooding Mechanisms – Bonniconlon Reservoir.

Source/Pathway	Significant?	Comment/Reason
Coastal flooding	No	>8 km inland, >90 m OD, well above coastal/tidal flood extents
Pluvial/Overland flow	No/Low	Not mapped; gently sloping ground; good field drainage
Fluvial/River flooding	No	Outside CFRAM/NFIM flood zones; no adjacent river channel
Flooding from artificial drainage systems	No	There are no major artificial or urban drainage systems on site. Minor field drains in adjacent agricultural land do not intersect the site.
Groundwater flooding	No	No GSI-mapped groundwater flood risk, turloughs, or groundwater/surface water flooding in or near the site.
Estuarial flooding	No	The site is far inland, with no tidal or estuarial flood influence.
Failure of infrastructure	No	No history of failure, but ongoing maintenance required

2.8.5 Flood Risk Investigation

2.8.5.1 OPW Flood Maps

A preliminary flood risk assessment has been undertaken for Bonniconlon Reservoir site, in accordance with the Planning System and Flood Risk Management Guidelines for Planning Authorities (2009). The assessment utilised both national and local flood mapping datasets, with particular emphasis on the OPW's CFRAM predictive flood extent layers (available at www.floodinfo.ie). For fluvial (river) flood risk, the CFRAM mapping for Flood Zone A (1% Annual Exceedance Probability [AEP], or 1-in-100-year) and Flood Zone B (0.1% AEP, or 1-in-1,000-year) were reviewed and overlaid on the site boundary.

Fluvial/River Flood Risk

A review of OPW CFRAM (Catchment Flood Risk Assessment and Management) mapping, National Indicative Fluvial Mapping (NFIM), and historic flood event datasets was carried out to assess the fluvial (river) flood risk at Bonniconlon Reservoir site. The CFRAM 1% AEP (100-year) and 0.1% AEP (1,000-year) modelled flood extents were mapped for all significant watercourses in the area and overlaid with the site boundary (Figure 2-68). The site is outside of any CFRAM-mapped fluvial flood zones for both standard and extreme probability events. There is no overlap or proximity between the reservoir boundary and the modelled floodplain for the nearest rivers or streams. The closest mapped watercourse is a minor stream located south of the site, but its CFRAM-mapped floodplain is farther away from the site. Further, NFIM outputs for both the 1% and 0.1% AEP events show no indicative fluvial flood risk extents on or adjacent to the site, confirming the CFRAM finding and providing an additional layer of certainty where detailed catchment modelling may not be available for smaller streams. The local river network is mapped, but no watercourse runs through, borders, or poses an overbank flood risk to the reservoir compound. A review of OPW historic flood events also confirms that there are no recorded or recurring flood incidents at or near the Bonniconlon Reservoir site. The nearest mapped event is downstream and remote from the reservoir, with no topographic or hydraulic connection to the site. In summary, there is no identified fluvial flood risk to Bonniconlon Reservoir site from any mapped, modelled, or historic river flooding source.

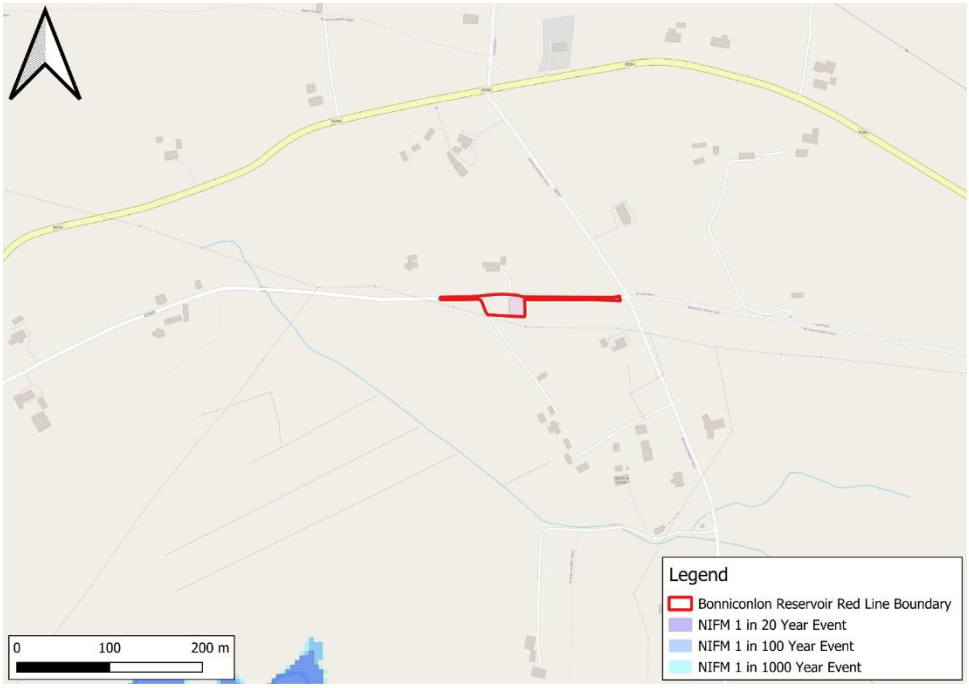


Figure 2-68 – Fluvial Flooding extents – Bonniconlon Reservoir

Coastal/Tidal Flood Risk

A review of OPW CFRAM coastal flood mapping for the Bonniconlon Reservoir site has been undertaken, including the 0.5% AEP (200-year) and 0.1% AEP (1,000-year) coastal flood extents (Figure 2-69). The CFRAM coastal flood extents are entirely confined to the shoreline areas of the North Mayo coast, situated well over 8 km to the northwest of the Bonniconlon Reservoir site. There is no mapped intersection or proximity between the site boundary and any CFRAM-mapped coastal/tidal flood zone, either under current conditions or in extreme (climate change) scenarios. The reservoir site is well above the maximum potential reach of tidal flooding or storm surge. No river, estuary, or drainage pathway connects the reservoir site to the sea or any tidally influenced watercourse. The local topography and absence of any low-lying channel or corridor further preclude the possibility of any direct or indirect coastal flood pathway to the site. Overall, there is no coastal or tidal flood risk to Bonniconlon Reservoir site.

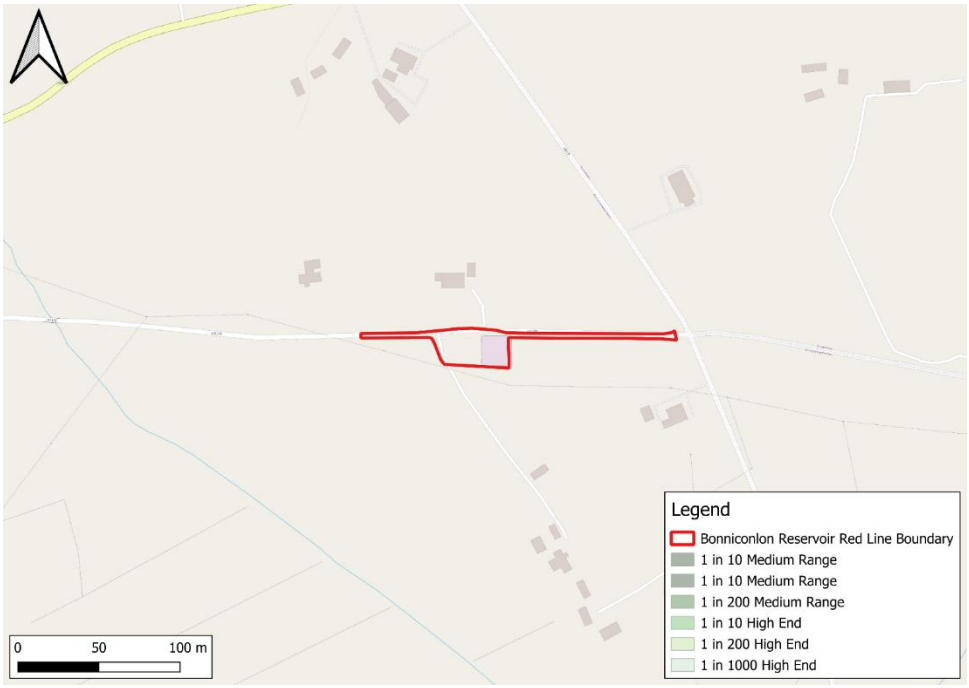


Figure 2-69 – Coastal / Tidal Flooding Extents – Bonniconlon Reservoir

Groundwater Flood Risk

A review of Geological Survey Ireland (GSI) maximum historic groundwater flood mapping and high-probability groundwater flood polygons was carried out for the Bonniconlon Reservoir site (Figure 2-70). The mapping confirms that the site and its immediate surroundings do not intersect any area of mapped maximum historic groundwater flooding or high-probability groundwater flood risk. The nearest groundwater flood polygon, representing a historic or modelled event, is located over 1 km to the southwest and is entirely outside the reservoir's catchment and topographic context. There are no karst features, turloughs, springs, or mapped groundwater-dependent wetlands within or adjacent to the site. The reservoir is located on gently sloping, well-drained ground, with no evidence of local low points or enclosed basins that might promote groundwater emergence or ponding during high groundwater conditions. Furthermore, no groundwater flooding incidents have been reported in the local area, and there is no interaction between the site and any GSI groundwater flood risk polygons. The underlying geology is not indicative of rapid groundwater level change or risk of groundwater flooding. In summary, there is no evidence of groundwater flood risk at Bonniconlon Reservoir site.

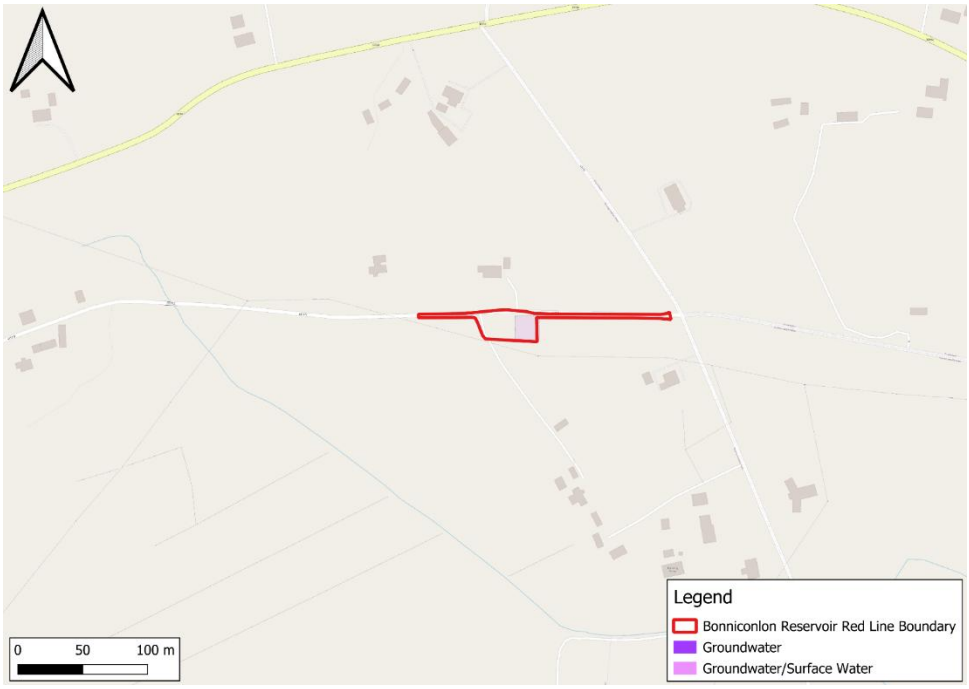
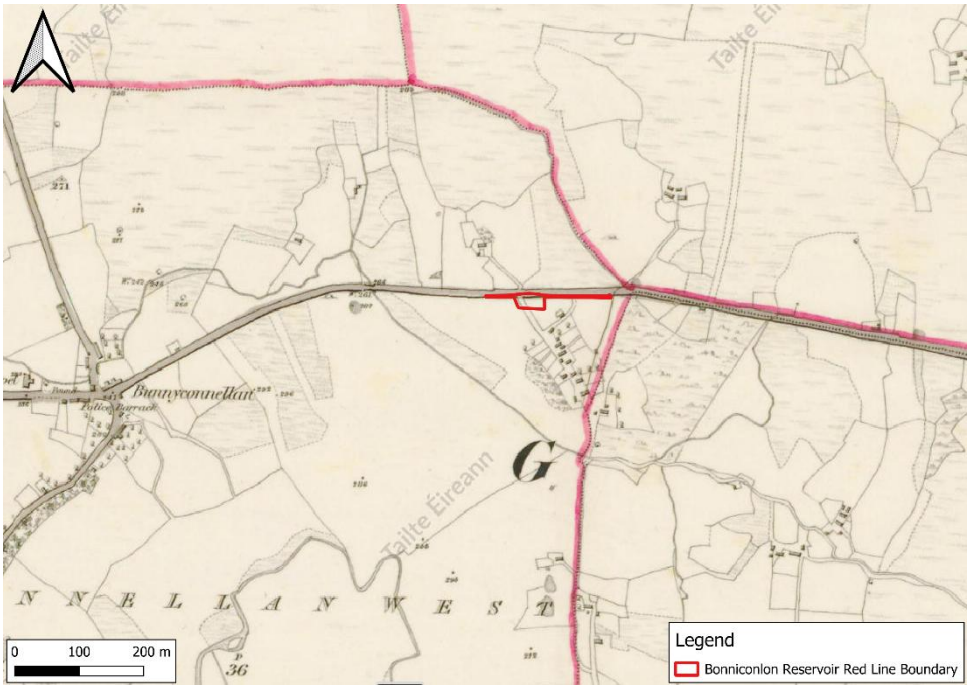


Figure 2-70 – Groundwater flooding extents – Bonniconlon Reservoir

2.8.6 Historical Maps

A review of historic Ordnance Survey Ireland (OSI) mapping has been undertaken for the Bonniconlon Reservoir site, via the ArcGIS web viewer (https://www.arcgis.com/apps/webappviewer) incorporating both the 6-inch (early to mid-19th century) and 25-inch editions (Figure 2-71 and Figure 2-72). Across both map series, the area now occupied by Bonniconlon Reservoir site is consistently depicted as agricultural land with established field boundaries and rural trackways. Notably, there is an absence of mapped marshes, standing water, drainage ditches, or historic watercourses on or near the site. The presence of lime kilns on both map editions, located to the north and south of the site, suggests that the ground was historically regarded as dry and stable, suitable for rural industry and agriculture. The continuity of field patterns and road alignments over time, with no evidence of historic land loss or infrastructure diversion due to flooding, further supports the conclusion that the site has not been subject to persistent drainage or flood problems.


Tailte Éireann
Tailte Éireann
Tailte Éireann

2009). The SFRA was reviewed and observed that there was no data available for the area corresponding to Bonniconlon Reservoir site.

2.8.8 Conclusion

The Stage 1 Flood Risk Assessment for Bonniconlon Reservoir site has screened all sources of flood risk, including fluvial, coastal, groundwater, pluvial (surface water), and artificial drainage, using the best available OPW, GSI, Mayo County Development Plan, SFRA, topographic, geological, and historic mapping datasets. The site is confirmed to be outside Flood Zone A and Flood Zone B and is therefore classified as Flood Zone C for all relevant flood mechanisms. No mapped or historic flood events, wetland features, groundwater emergence, or local drainage issues have been identified at or near the site. The existing and proposed reservoir use is “water-compatible development” under national and county policy, is fully appropriate at this location, and no justification is required. Stage 1 FRA is concluded for Bonniconlon Reservoir site.

2.8.9 Recommendation

It is recommended that the Proposed Development at Bonniconlon Reservoir site proceed without the need for further (Stage 2 or 3) flood risk assessment or specific flood mitigation measures, other than standard good practice for site drainage and periodic maintenance of field drains. Continued adherence to Mayo County Development Plan policy on Sustainable Drainage Systems (SuDS) and site management will ensure ongoing resilience to local surface water during extreme rainfall. No additional flood risk management actions are warranted for this site.

3. Stage 2 Flood Risk Assessment

3.1 Wherrew RWI&PS Stage 2 Initial Flood Risk Assessment

A Flood risk assessment (FRA) has been undertaken for the site to satisfy the requirements of the Planning System and Flood Risk Management Guidelines. The report aimed at scoping source of flooding, assessing whether any significant flood risk issues exist and proposing appropriate flood risk management measures as required, The Stage 1 Flood Risk Assessment identified that Wherrew RWI & PS site is potentially affected by fluvial flood risk.

A Stage 2 Initial Flood Risk Assessment was undertaken using the available OPW flood mapping, recent survey information and the proposed development layout.

Recent topographical survey data, bathymetric survey data and the proposed site design were reviewed to further assess flood risk at the intake structure location. Bathymetric survey data indicate that the lake bed level at the proposed intake structure is approximately 6.8 m OD (Appendix 1 and 2), while the proposed intake platform top level is approximately 10.65 m OD. This is constrained by the existing infrastructure levels.

Review of the CFRAM Flood Depth Mapping (Dataset Reference: *w_0034-93_dep_f_c_d_0100_ds1_f03*) indicates a modelled flood depth of approximately 0.4 m at a surveyed ground level of 10.68 m OD during the 1% AEP (100-year) fluvial event, corresponding to an estimated flood water level of approximately 11.08 m OD. However, the same dataset indicates a flood depth of approximately 2.32 m at the proposed intake structure location. When applied to the surveyed lake bed level of approximately 6.8 m OD, this would yield an estimated flood water level of approximately 9.12 m OD, which is significantly lower than the flood level derived from the adjacent platform location (Figure 3-1). This discrepancy is likely attributable to limitations in the CFRAM Medium Priority Watercourse mapping, the resolution of the underlying flood depth dataset, and/or the fact that the Digital Terrain Model (DTM) used in the flood mapping may not fully represent the surveyed bathymetric lake bed. The flood depths within the open waterbody were derived and an independent assessment of lake levels was also undertaken. Statistical analysis of the available daily mean water level record from “34082 LEVEL Gortnaraby”, supplemented through infilling using “34081 LEVEL Pontoon”, indicates a 95th percentile lake level of 8.31 m OD. When combined with the modelled 1% AEP flood depth of 2.32 m at the intake structure location, this yields an estimated 1% AEP flood water level of approximately 10.63 m OD. This estimate provides an independent check of the CFRAM-derived flood levels and is broadly consistent with the flood risk assessment undertaken for the site. Adopting a precautionary approach, the higher flood level of 11.08 m OD has been taken as the worst-case design flood level for the assessment of flood risk and resilience of the proposed intake works.

In summary, the assessment therefore deemed that the proposed intake platform may be submerged during the 1% AEP flood event.

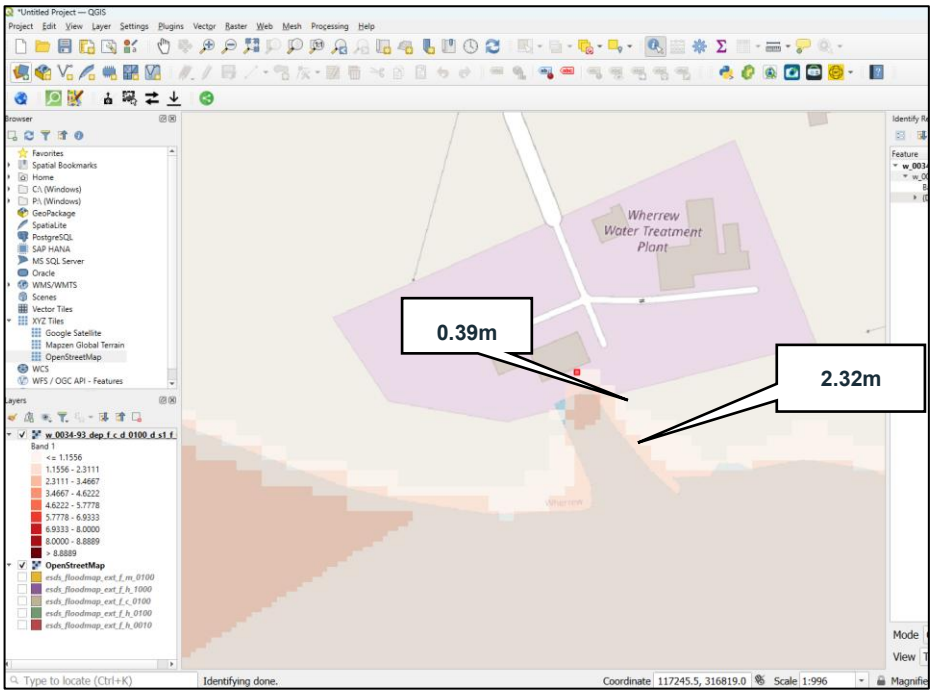


Figure 3-1 – CFRAM Modelled Flood Depths for the 1% AEP (100-year) Fluvial Event under the Present Day Scenario

3.1.1 Stage 2 Assessment and Sequential Approach

The findings of the Stage 1 Flood Risk Identification confirmed the presence of fluvial flood risk associated with the proposed Intake Structure within the site. Consequently, a Stage 2 Initial Flood Risk Assessment has been undertaken using available OPW flood mapping.

The proposed development has been assessed in accordance with the Sequential Approach set out in the OPW and Departmental Guidelines. The intake structure forms essential water supply infrastructure that, by its nature, must be located at the lake shoreline to facilitate abstraction from the source waterbody. Alternative locations outside the floodplain are not feasible due to the operational requirements of the infrastructure.

The structure will be designed to withstand periodic flooding and remain structurally stable during flood conditions. Floodwater is permitted to pass through and around the structure without causing obstruction to flow paths or displacement of flood waters.

The proposed intake structure is “water-compatible development”, with its primary function requiring direct interaction with the water environment. The structure is designed as a submersible asset and therefore does not depend on the exclusion of floodwater to remain operational. In accordance with the flood-resilient design principles set out in the “The Planning System and Flood Risk Management”, the design accepts the potential ingress of floodwater and incorporates measures to minimise damage following a flood event. All the mechanical and electrical equipment will be located outside the identified flood risk area and above the relevant design flood level, as appropriate. As floodwater does not compromise the essential function of the intake structure and suitable resilience measures have been incorporated, the development is considered to be flood resilient and appropriately classified as a water-compatible use.

The proposed development will not result in land raising, loss of floodplain storage, obstruction of flood flow routes or displacement of floodwaters. Consequently, the development will not increase flood risk elsewhere. Residual risks associated with extreme flood events are considered acceptable given the nature of the infrastructure and its intended operational function.

3.1.2 Conclusion

The 1% AEP flood level of 11.58 m OD (including 500 mm freeboard) has been taken as the design flood level for the assessment. While the proposed intake platform level (10.65 m OD) may be submerged during an extreme flood event, the intake structure is designed to be water compatible, as a submersible asset and is capable of operating safely under flooded conditions. Consequently, the residual flood risk to the proposed intake works is considered acceptable

There is no significant risk to the site from pluvial (surface water), groundwater, coastal/tidal, or artificial drainage sources, as confirmed by OPW mapping, GSI records, and historic flood event data. The site's natural drainage and topography further reduce residual surface water risk.

3.1.3 Recommendations

No Further FRA Required for Planning Purposes since the Wherrew RWI & PS is classified as water-compatible and its location is functionally dependent on proximity to the waterbody, no further detailed (Stage 3) FRA is required for planning consent under current guidelines. Key mitigations are recommended below.

Key mitigation measures include:

- Intake structure designed to be fully submersible during flood events.
- Structural elements designed to withstand potential flood loading.
- Sensitive electrical and control equipment located either above design flood levels or outside the floodplain where practicable.
- Access, maintenance and operational procedures to be developed with consideration of flood conditions and residual risk.

4. Appendices

Appendix A. Supporting Information

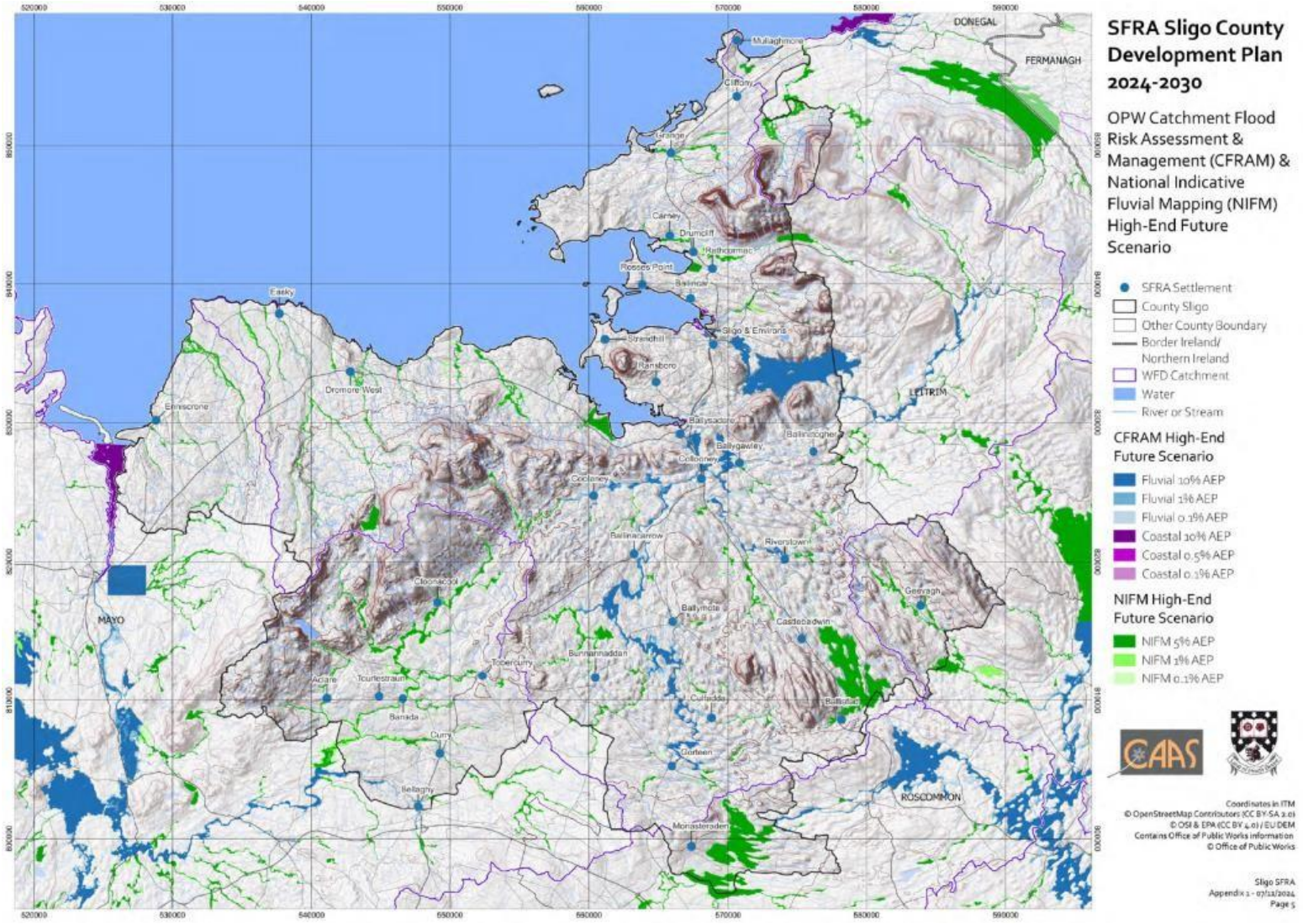


Figure 4-1 – Sligo County Development Plan 2024-2030: OPW CFRAM & NFIM High-End Future Scenario

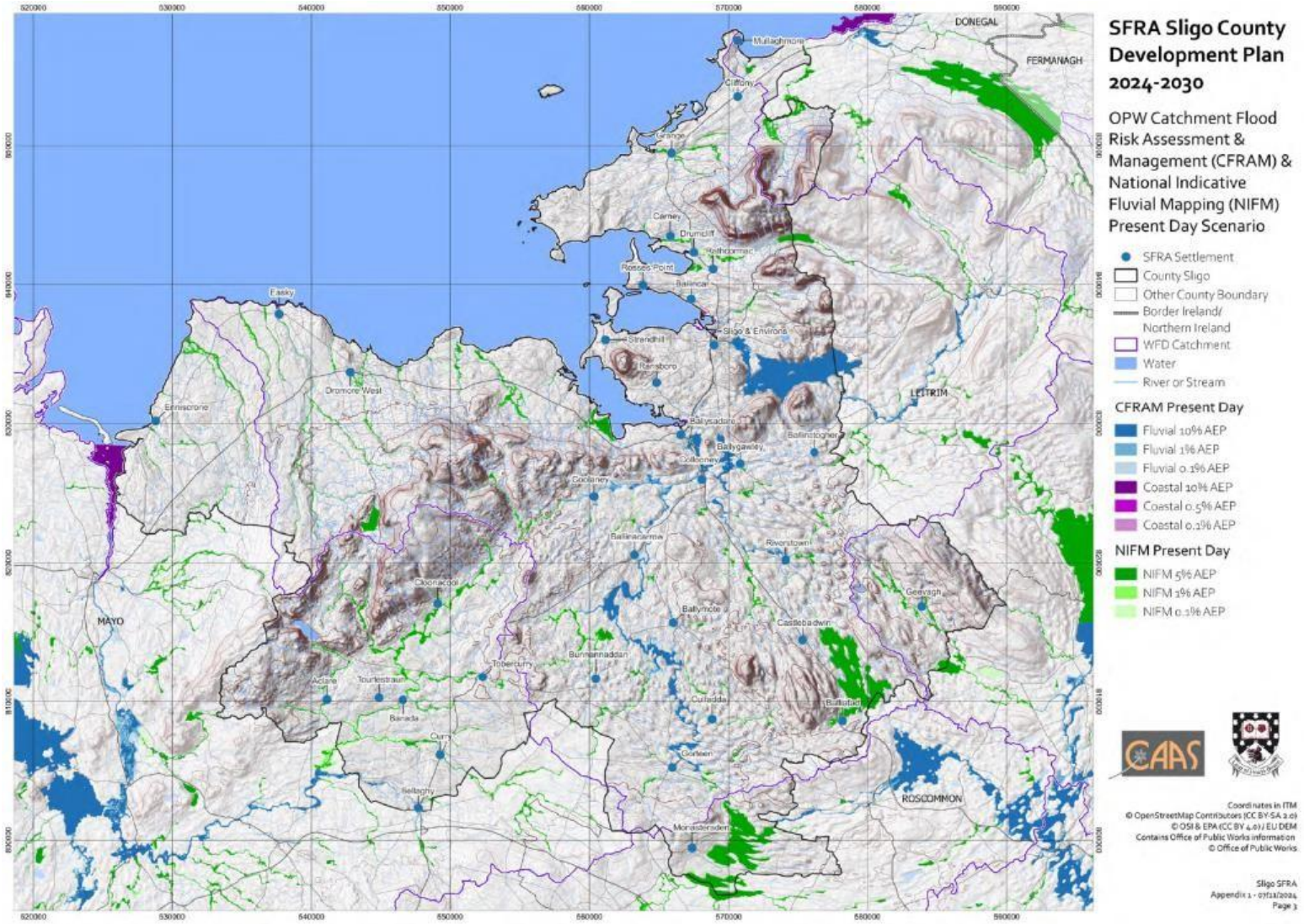


Figure 4-2 – Sligo County Development Plan 2024-2030: OPW CFRAM & NFIM Present Day Scenario

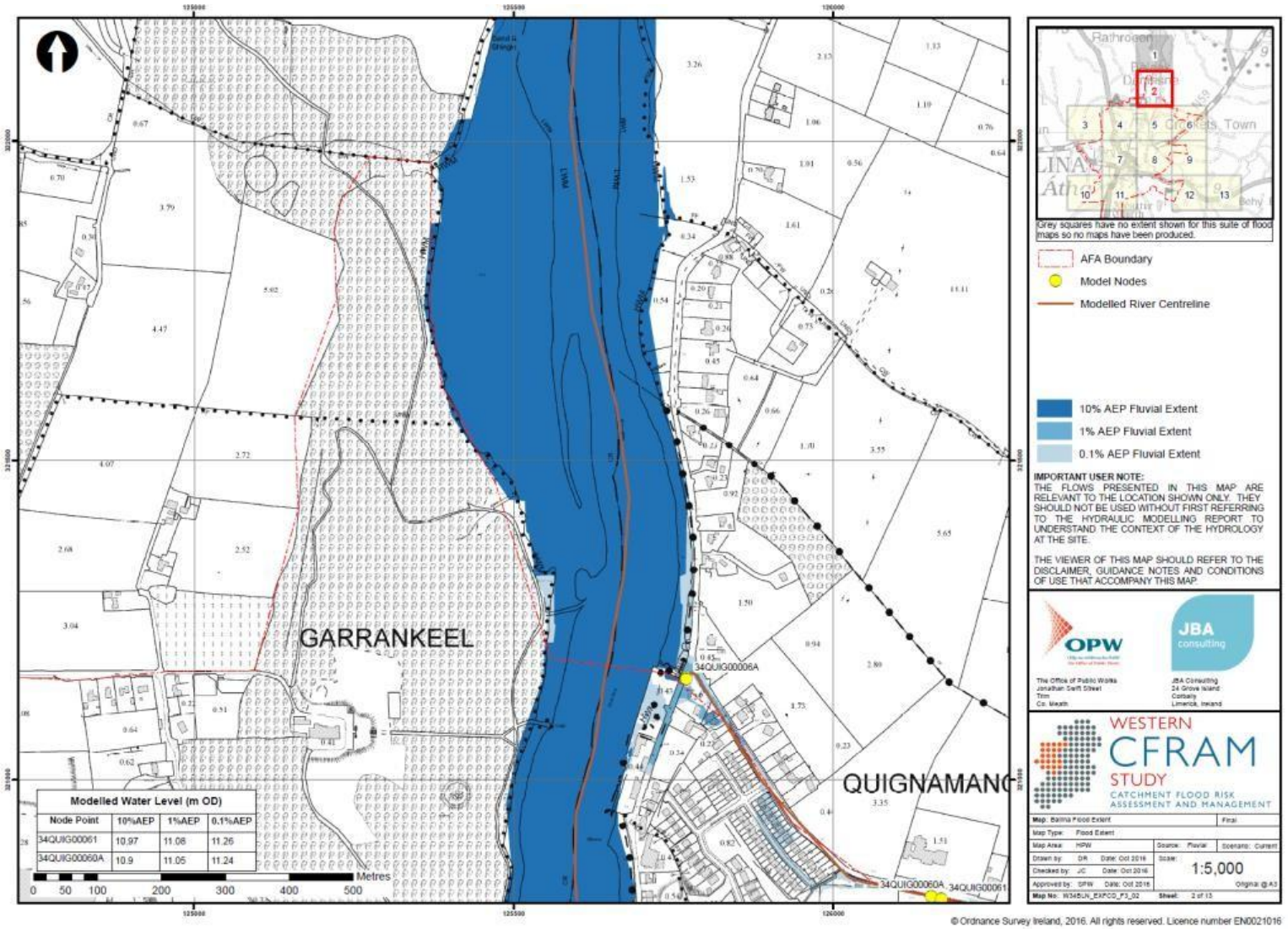


Figure 4-3 – Western CFRAM Study – River Moy (floodmap.ie / NIFM mapping Ballina and Environs Tile 2)

Payam Sajadi
AtkinsRéalis Ireland Limited
150-155 Airside Business Park
Swords
Co. Dublin
K67 K5W4

<contact info>

© AtkinsRéalis Ireland Limited except where stated otherwise