



CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN

Project: Laois Kilkenny Electricity Reinforcement Project – Unit 1: A new 400kV/110kV Substation at Coolnabackey townland, Co. Laois.

Client: ESB Engineering and Major Projects

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1 INTRODUCTION

The Laois Kilkenny Electricity Reinforcement Project (Planning reference ABP PL REF. 11/VA0015) aims to reinforce the electricity grid in the Laois and Kilkenny area through upgrading of existing overhead electricity lines and substations, as well as the construction of new overhead electricity lines (OHLs) and new substations and their connection to the national transmission system with short lengths of underground cables (UGCs).

The planning application for this development included an Environmental Impact Statement (EIS) and a Natura Impact Statement (NIS). Planning Permission, granted by An Bord Pleanála, was accompanied by 11 planning conditions, condition 11 requiring the submission of a Construction Environmental Management Plan (CEMP) prior to commencement of development addressing various items listed in the condition.

The permitted development comprises a number of units within County Kilkenny and County Laois (ABP PL REF. 11.VA0015). This CEMP covers construction activity in relation to Unit 1: Coolnabacky 400kV/110kV GIS Substation

For completeness all units associated with the Laois Kilkenny Reinforcement Project are listed below.

- Unit 1: New 400/110 kV GIS substation at Coolnabacky townland, Co. Laois.
- Unit 2: New connection to Coolnabacky from the existing Moneypoint-Dunstown 400kV line (c. 1.4km).
- Unit 3: New 110kV connection to Coolnabacky substation from the existing Athy-Portlaoise 110kV line.
- Unit 4: A new 110kV / 38kV / MV substation in Ballyragget, Co. Kilkenny.
- Unit 5: The construction of a new 110 kV overhead line between Ballyragget and Coolnabacky (c. 26km).
- Unit 6: An Upgrade of the existing Ballyragget-Kilkenny 110kV overhead line (c. 22km).
- Unit 7: A New Bay in the Existing Kilkenny 110kV station. Under ABP Reference 305108 additional works to Unit 7 were approved.
- Unit 8: Modifications to existing Athy-Portlaoise 110kV line.

This Construction and Environmental Management Plan (CEMP) relates to the civil engineering and building works for Coolnabacky 400 kV/110kV Substation carried out by Kilwex Ltd on behalf of ESB. The electrical fit out and transformer installation, which will take place upon completion of the building construction, shall be managed under separate submissions.

This CEMP has been developed specifically for this project and outlines construction practices and environmental management measures which will be implemented during the construction phase, to ensure that the project is constructed in accordance with best practice and with minimal impact on the surrounding environment. All operations shall be completed in compliance with the relevant environmental legislation. A table of the relevant legislation is listed in Appendix 1.

2 THE DEVELOPMENT

2.1 Site and Project Overview

The substation will be constructed in a 6.7-hectare field in the townland of Coolnabacky approximately 2km north of the village of Timahoe, County Laois. See figure 1 below.



Figure 1 Construction location Coolnabacky 400kV Substation Site

The permitted development consists of the following:

- 110kV GIS building
- 400kV GIS building
- 2 no. Transformers positioned in bund enclosures
- Associated compound and all other infrastructure contained within.

2.2 Planning Compliance:

In addition to ESB's Minimum Environmental Requirements, this CEMP was developed in compliance with Condition 11 of the planning permission ABP PL REF. 11.VA0015.

All planning conditions pertinent to the construction of Coolnabacky Substation are listed below, together with references to the relevant subsections within the CEMP:

Condition No. 2

'(a) The mitigation measures identified in the environmental impact statement, Natura impact statement, and associated documentation on file, shall be implemented in full, except as may be required to comply with the following conditions.

- All mitigation as set out in the EIS and NIS and all associated documents submitted as part of the planning application are collated in Section 6 of the CEMP and will be implemented in full during the pre-commencement, construction and operational phases of the permitted development.

(b) The construction of the proposed development shall be supervised by suitably qualified and experienced environmental personnel, to ensure that all environmental mitigation and monitoring measures are implemented in full.'

- The Contractor has retained the services of Coyle Environmental to support, supervise and advise on all environmental elements of the permitted development including the implementation of all environmental mitigation and monitoring measures. Functions of the environmental personnel are detailed in Section 5.3.

Condition No. 3

Prior to commencement of development, and following consultation with the National Parks and Wildlife Service, the following shall be submitted to and agreed in writing with the relevant planning authority:

(i) installation details for bird flight diverters,

- This condition applies to Unit 5 and will be implemented under a separate compliance submission. Overhead lines are not part of this Unit 1 development.

(ii) details of pre-construction surveys for badgers, otters and bats,

- Details of the preconstruction surveys are available in Section 2.3.2.1, Section 2.3.3 Ecology and Section 7 Monitoring Section .

(iii) in the event of these surveys identifying these species, measures for their protection shall be identified and incorporated into the construction management plan, and

- Measures for protection for any species identified are included in Section 4 Environmental Management.

(iv) reporting procedures for the above.

- Please see Section 8 Auditing Measures.

Condition No. 4

'Works in the vicinity of rivers and streams shall comply with the "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites" issued by the Eastern Regional Fisheries Board'.

- Section 3.2 refers to robust surface water management measures and drainage design which are in compliance with the requirements of the above guidance.

Condition No. 5

'Water supply and drainage arrangements, including the disposal of surface water, shall comply with the requirements of the planning authority for such works'.

- Section 3.2 provides details on onsite drainage including the management of surface water. Section 3.1.2 provides details of water supply for the construction phase of the project. It also details wastewater management from site welfare facilities.

Condition No. 6

'The proposed wastewater treatment and disposal systems to serve the two substations shall be designed, constructed and maintained in accordance with the requirements of the 'Code of Practice - Wastewater Treatment and Disposal Systems Serving Single Houses', issued by the Environmental Protection Agency (2010), and in accordance with the details set out in the documentation submitted by the undertaker on file and at the oral hearing. Construction stage details of the measures for the collection and final disposal of wastewater shall be submitted to and agreed in writing with the relevant planning authority, prior to the commencement of development at each substation site'.

- During the construction phase a temporary holding tank will be installed for the duration of the works. Section 3.1.2 and the Resource Waste Management Plan provides details on waste management and wastewater from the site welfare facilities.

Condition No. 7

'The two substation sites shall be landscaped using only indigenous deciduous tree and hedging species. The proposed landscaping at the Ballyragget substation shall be supplemented by the dense planting of indigenous tree and hedging species along the entire northern boundary of the site'.

- Landscaping will be carried out in accordance with the landscape design outlined in the planning application. Only indigenous, deciduous trees and hedging species will be planted in this development.

Condition No. 8

'All road surfaces, culverts, watercourses, verges and public lands shall be protected during construction, and in the event of any damage occurring, shall be reinstated to the satisfaction of the relevant planning authority'.

- Pre-condition surveys of any road surfaces, culverts, watercourses, verges and public lands will be carried out in the immediate adjoining and adjacent lands. Condition monitoring will be undertaken during routine site inspections as outlined in Section 4 Environmental Management and any issues directly attributable to the development shall be addressed to the satisfaction of the planning authority.

Condition No. 9

'Prior to commencement of development, and following consultation with the Department of Arts, Heritage and the Gaeltacht, a methodology shall be submitted to and agreed in writing with the relevant planning authority for the replacement of existing polesets that are situated in close proximity to existing archaeological features'.

- This condition is not applicable to Unit 1 (Coolnabacky Substation) as there are no poleset replacements in this development. Condition no.10 identifies Archaeological requirements associated with these works.

Condition No. 10

'The undertaker shall facilitate the archaeological appraisal of the site and shall provide for the preservation, recording and protection of archaeological materials or features which may exist within the site. In this regard, the undertaker shall:-

(a) notify the planning authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development,

(b) employ a suitably-qualified archaeologist prior to commencement of development. The archaeologist shall assess the site and monitor all site development works. The assessment shall address the following issues:-

(i) the nature and location of archaeological material on the site, and

(ii) the impact of the proposed development on such archaeological material, and

(c) particular care shall be taken in replacing polesets close to archaeological features.

'A report, containing the results of the assessment, shall be submitted to the planning authority and, arising from this assessment, the undertaker shall agree in writing with the planning authority details regarding any further archaeological requirements (including, if necessary, archaeological excavation) prior to commencement of construction works. In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanála for determination'.

- Archaeological consultant, Byrne Mullins, has been retained to advise and supervise the excavation work. Once commencement date is agreed, the planning authority will be notified 4 weeks in advance of commencement. Please see Section 5.3.5 Archaeology, which outlines the roles and actions to be undertaken as part of the permitted development.

Condition No. 11

'The construction of the development shall be managed in accordance with a Construction Management Plan, which shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. This plan shall provide details of intended construction practice for the development, including:

- This CEMP has been prepared to address the provisions of Condition 11. Details of compliance has been outlined throughout this document with specific section references set out below.

(a) location of any site and materials compound(s) including area(s) identified for the storage of construction refuse;

- Details relating to site compound and storage of materials is included in the Site Logistics Plan. Please see Appendix 2.

(b) location of areas for any construction site offices and staff facilities;

- Details relating to site offices and staff facilities are included in the Site Logistics Plan. Please see Appendix 2.

(c) details of site security fencing and hoardings;

- Details relating to site security fencing and hoarding are included in the Appendix 3 Outline Earthmoving Plan and Section 3.1.1 Site Preparation Tasks.

(d) details of on-site car parking facilities for site workers during the course of construction;

- Details relating to site parking facilities for workers are included in the Appendix 2 Site Logistics Plan.

(e) details of the timing and routing of construction traffic and any required directional signage, to include proposals to facilitate the delivery of abnormal loads to the site;

- Details relating to timing and routing of construction traffic are included in Section 4 Environmental Management and Appendix 4 Traffic Management.

(f) measures to obviate queuing of construction traffic on the adjoining road network;

- Details relating to management of construction traffic on the adjoining roads are included in Section 4.6 Traffic Management and Appendix 4 Traffic Management Plan.

(g) measures to prevent the spillage or deposit of clay, rubble or other debris on the public road network;

- All excavated material is being retained on site. Please see Appendix 4 Traffic Management Plan.

(h) alternative arrangements to be put in place for pedestrians and vehicles in the case of the closure of any public road or footpath during the course of site development works;

- It is not envisaged that this development will require closure of any public roads or footpaths.

(i) provision of parking for existing properties during the construction period;

- There are two neighbouring dwellings to this development, and it is not envisaged that parking for either will be impacted during the construction work.

(j) details of appropriate mitigation measures for noise, dust and vibration, and monitoring of such levels;

- Appropriate measures are outlined in Section 4 Environmental Management and Section 6 Mitigation Measures.

(k) containment of all construction-related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained; such bunds shall be roofed to exclude rainwater;

- Details relating to fuel and oil management is outlined in Section 4.3 Refuelling and Section 3.1.2 Compound layout and formation.

(l) off-site disposal of construction/demolition waste and details of how it is proposed to manage excavated soil;

- There are no demolitions works in this project. All excavated spoil is to remain on site and stored in berms, which form part of the permanent works.

- Waste management is detailed in Section 4.8 Waste Management and in the Resource and Waste Management Plan in Appendix 5.

(m) means to ensure that surface water run-off is controlled such that no silt or other pollutants enter watercourses;

- Surface water management is outlined in the following sections, Section 3.2 Drainage, Section 4. Environmental Management, and Appendix 6 Drainage layout drawing.

(n) hours of site development and construction; and

- Working hours during construction are 7am to 7pm Monday to Friday with Saturday works from 7am to 1pm. Working hours will not exceed this timeframe unless for certain specified tasks which will be identified and agreed with the local authority in advance.

(o) provision for the prevention of the invasive spread of plant species.

- Invasive Species Management is outlined in Section 4.7 Ecology Management.

A record of daily checks that the works are being undertaken in accordance with the Construction Management Plan shall be kept for inspection by the planning authority’.

- Details of daily checks are contained in Section 7 Monitoring and Section 8 Auditing. Records will be made available on request to the planning authority.

The CEMP aims to provide the environmental management framework that will be adhered to during the pre-commencement phase of the development. It outlines the work practices, construction management procedures, management responsibilities, mitigation measures and monitoring proposals that are required to be implemented during construction of this project.

The mitigation measures presented in the Environmental Impact Statement (EIS) and a Natura Impact Statement (NIS) prepared for this project at planning stage, which are relevant to the Coolnabacky Substation, are addressed in section 6: Mitigation Measures.

2.3 Existing Environment

This section of the CEMP summarises the existing conditions of the site as set out in the Environmental Impact Statement (EIS) submitted as part of the planning application, along with information obtained from Geological Surveys of Ireland Database (GSI) 2022 and recent site surveys/walkovers carried out by specialist contractors in 2022 and 2023.

Measures for management of these features and existing conditions are further detailed throughout the CEMP.

2.3.1 Geological Features

The following geological features are present at permitted development:

- Gravels derived from limestones identified to the north, west and south of the site
- Alluvium (Principal subsoil) - loose, weathered and/or eroded rock material that has formed in particles
- Shallow poorly drained mineral (manly basic) (BminSP) present in the north, west, and south of the site

2.3.2 Hydrological / Hydrogeological

The following describes details associated with the hydrogeological and hydrological features present:

2.3.2.1 Hydrological

- The site is located within the Timahoe (Barrow) River Catchment area.
- A shallow, spring fed watercourse lies along the north-western and northern boundary of the site flowing eastwards. A field drain channel along the eastern boundary of the site drains to this watercourse.
- This watercourse then extends to the Timahoe River c. 500 m downstream from the site.
- The Timahoe River feeds into the Bauteogue River which then forms part of the River Barrow and Nore SAC c. 4.5 km downstream from the site.
- The site boundary watercourses were identified as spring fed, Tufa forming streams (**See Section 2.3.3.1 Petrifying Springs with Tufa Formation**)

2.3.2.2 Hydrogeological

- The site is located on a Regionally Important Karstified (diffuse) bedrock aquifer and a locally important sand/gravel aquifer
- The underlying bedrock geology comprises limestone of the Ballyadams Formation, a regionally important bedrock aquifer which is described as a thick bedded feature
- Groundwater Vulnerability category for the underlying aquifers is recorded as 'Moderate'
- Granular sand and gravel deposits at the site are very thin and non-uniform
- Groundwater in the sand and gravel deposits is not expected to be in hydraulic continuity with the bedrock aquifer underlying the site.

2.3.3 Ecology

The following provides details of ecological features as identified during recent surveys:

- The site is identified as a low-lying, level field of dry calcareous and neutral grassland
- This habitat appears rough, species poor and dominated by a swathe of Creeping Bent Grass (*Agrostis stolonifera*), Dock (*Rumex spp*) with occasional Buttercup (*Ranunculus repens*) and Dandelion (*Taraxacum spp*)
- The site is bound by stunted hedgerows comprising extensive species including Hazel (*Corylus avellana*), Ash (*Fraxinus excelsior*) and Willow (*Salix spp.*)
- Interstitial scrub including stands of Blackthorn (*Prunus spinosa*) and Bramble (*Rubus spp.*) appear abundant along the northern boundary lining the watercourse.

- Both scrub and hedgerow habitat potentially provides sub-optimal foraging and refuge conditions for passing birds and commuting bat populations
- No rare or protected plant species were recorded during the site visits
- No invasive plant species stands were recorded during site visits
- No volant or non-volant mammals were observed during the site visits
- No active protected mammal habitats were identified

2.3.3.1 Petrifying Springs with Tufa Formation

- As detailed in Section 2.3.2.1, the boundary streams exhibit 'Tufa' forming deposits within the channel substrate.
- Tufa is a white to straw-coloured deposit of calcium carbonate (lime).
- The petrifying or 'tufa forming' spring, after undergoing complex chemical processes, emerges at the surface and precipitates calcium carbonate resulting in the Tufa features.
- This rare feature is present in varying concentrations along the length of the boundary stream and in particular along the Northern boundary section.

2.3.4 Archaeological

- An Archaeological Impact Assessment Report was prepared by Byrne Mullins Archaeologists on behalf of ESB in March 2022 and submitted to Laois County Council.
- Archaeological testing was undertaken in advance of permitted development works
- No archaeological findings were identified on site at that time.

3 CONSTRUCTION WORKS

This section of the CEMP will describe the construction methodologies and various elements of works to be undertaken as part of the permitted development.

Key elements of the civil works and activities associated with the construction phase of the development are as follows:

- Enabling Works and Site Establishment
- Drainage: Surface/Ground Water Management During Construction
- Main Construction
- Associated compound and all other infrastructure.

3.1 Enabling Works and Site Establishment

Before construction commences several preparatory activities will be carried out. The following key works will be undertaken as part of the site preparation and pre-construction activities.

3.1.1 Site Preparation Tasks

- **Overhead Cable Avoidance**
Installation of ESB overhead cable avoidance scheme. This includes installation of goalposts beneath the main power lines to establish a safe crossing point. The remainder of the overhead lines on the site will be barriered off to ensure no crossing beneath lines occurs outside of the designated crossing points. Barrier and goal posts will be placed in accordance with ESBs '*Code of Practice for Avoiding Danger from Overhead Electricity Lines*'.
Designated pedestrian crossings will also be included in the crossing points to ensure segregation between plant and site personnel.
- **Fencing & Security of Site**
Once overhead cable avoidance scheme is in place, all other pre-construction works can be undertaken. The entire site will be fenced using a heras fencing system to maintain security and prevent unauthorised access to site. A manned security hut will be located at the site entrance to control deliveries and access of authorised personnel.
- **Ecological Buffer Zone**
A buffer zone, in the form of Heras fencing, will be put in place to protect the ecologically sensitive area as outlined in Appendix 6 Drainage Plan.
A buffer zone of 25m will be applied on the concentrated tufa areas in the adjacent streams. A 10m buffer zone will apply to all other watercourses where possible.
- **Settlement Pond System with associated French drains and Silt Curtains**
The function of the settlement pond system is to allow for the storage and settlement of suspended solids from run off water that is discharged from the site. French drains and silt fences will be installed at the toe of soil mounds allowing run off water to be collected and discharged through the pond system.

The make-up of each settlement pond system involves the construction of 4No. bowl like shaped excavations with stone check dams separating each pond, forming a filter berm for water to pass through. Water will flow from pond to pond slowly reducing the quantity of suspended solids present in the water before discharging into the water course. These ponds will be installed prior to main earthwork operations commencing.

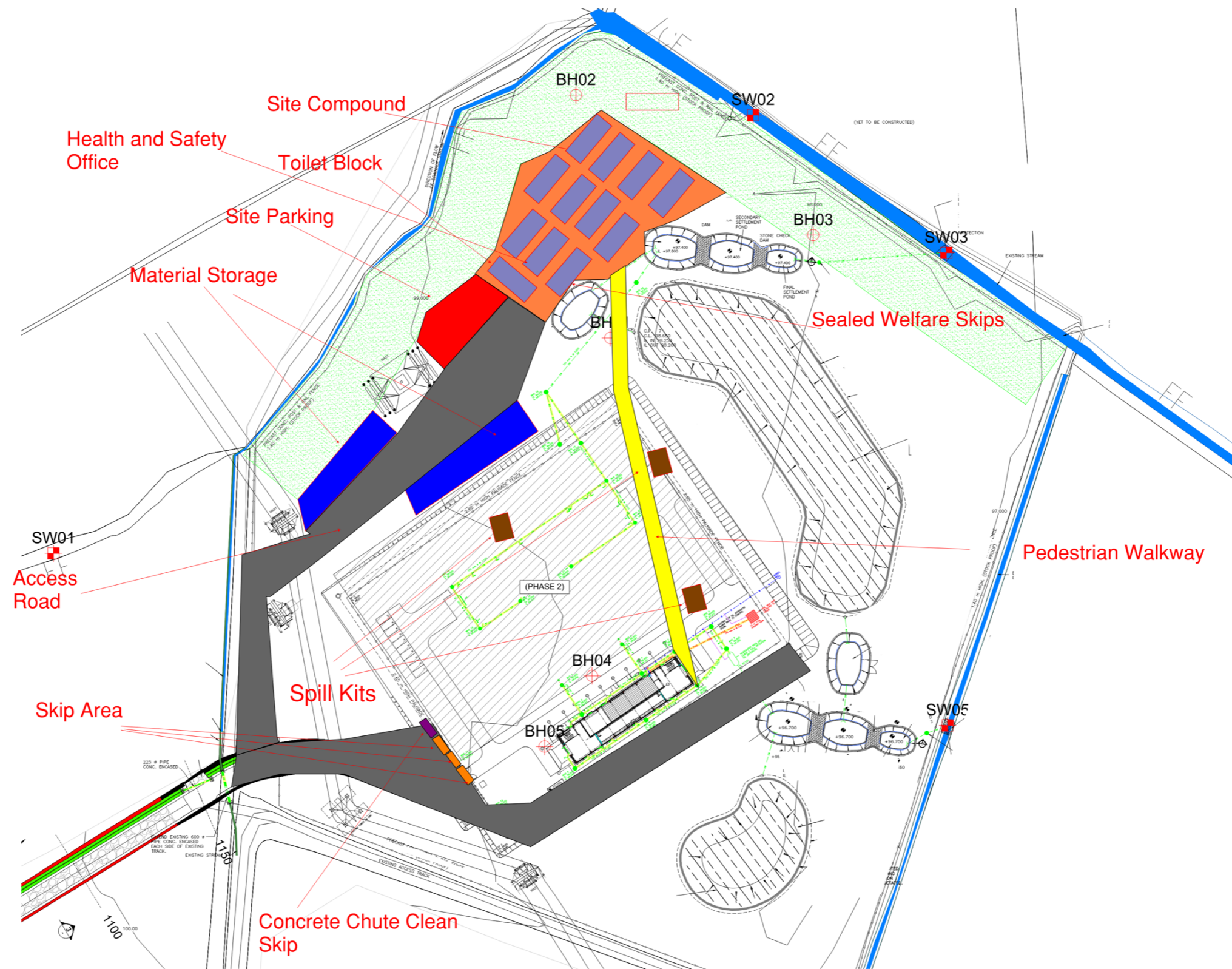


Figure 2 Site Logistics Plan

3.1.2 Site Compound Establishment and Layout

A site compound will be established within the site boundary as shown in Appendix 2 Site logistic Plan. See figure 2 above. The site compound will consist of the following:

- **Access (pre-existing)**
Currently there is a stoned access route to the west of the site with a hardstanding located at the constructed 400kV tower base. This hardstanding will be utilised for the access to the compound area – with additional stoning provided to the hardstanding/access route as required. The compound will be in place for the duration of the construction phase and will be removed when the project is complete.
- **Clearance of Scrub**
Prior to any clearance of scrub vegetation, the project ecologist will conduct confirmatory pre-construction surveys. The scrub clearance activity will be carried out with a hand strimmer and in small, localised sections under the supervision of the project ecologist.
- **Site facilities**
Offices, meeting rooms, toilet blocks, canteens, drying room, material storage containers and COSHH stores will be established on site for the duration of the works.
- **Water Requirement / Water Supply**
Water usage will be planned and minimised by utilising systems such as ready mix mortar being delivered to site, concrete trucks being washed down in their respective plants with their chutes only being washed on site. Dust suppression water shall be supplied from settlement ponds where possible. Potable water will be required for the welfare facilities. Water will be supplied on an as needs basis and will be transported to site and stored in IBC's.
- **Sealed foul holding tank**
During the construction phase, a proprietary self-contained toilet system with an integrated waste holding tank will be used on site for toilet facilities.
This certified tank will be located adjacent to the toilet block and is required for the duration of the project. It will be cleaned and emptied regularly by a licenced waste disposal contractor as per the Resource and Waste Management Plan. Please see Appendix 5.
- **Car parking.**
Carparking will be adjacent to the compound, as shown in the site logistics plan in Appendix 2. A designated walkway from carpark to compound will be established.
- **Storage**
Storage containers will be placed within the compound to store fuel powered equipment such as generators, consaws and materials etc. All fuel powered tools will be stored on a drip tray to prevent environmental contamination in the event of spillage. All chemicals and materials that risk environmental contamination will be stored in the COSHH store. A register of these materials will be kept with associated MSDS sheets.
- **Materials**
All building materials and aggregates, and in particular those which have a potential to add to potential silt/suspended solids in surface water (e.g. sand, loose aggregates, cement, dusty aggregates and blocks) will be stored in an appropriate manner and at least 10 metres from a designated water course.

The site compound will be constructed as follows:

- The area to be used as the compound will be marked out at the corners using ranging rods or timber posts.
- Where additional areas of access route and hardstanding are required, a layer of geotextile and compacted layers of crushed imported stone aggregate CL6F2/CL804 will be spread and compacted.
- Geotextile will be laid vertically at bounds of additional stoned areas to prevent fines from migrating outside of stoned areas. This will also mitigate run-off of fine sediment.

Areas within the site will be constructed and used as vehicle and material hardstanding. Upon completion of the project, the compound area will be reinstated to its original condition.

3.2 Drainage: Surface/Ground Water Management During Construction

Protection measures prior to main construction works shall include installation of fencing to existing boreholes and implementation of erosion and sediment controls.

Controls shall include silt fencing (refer fig 2 below), French drains (refer Fig 3 Below) and settlement ponds (refer fig.5 below).

The following sections give an overview of the surface water and groundwater management, with the drainage layout included in Appendix 6.

3.2.1 Silt Fencing

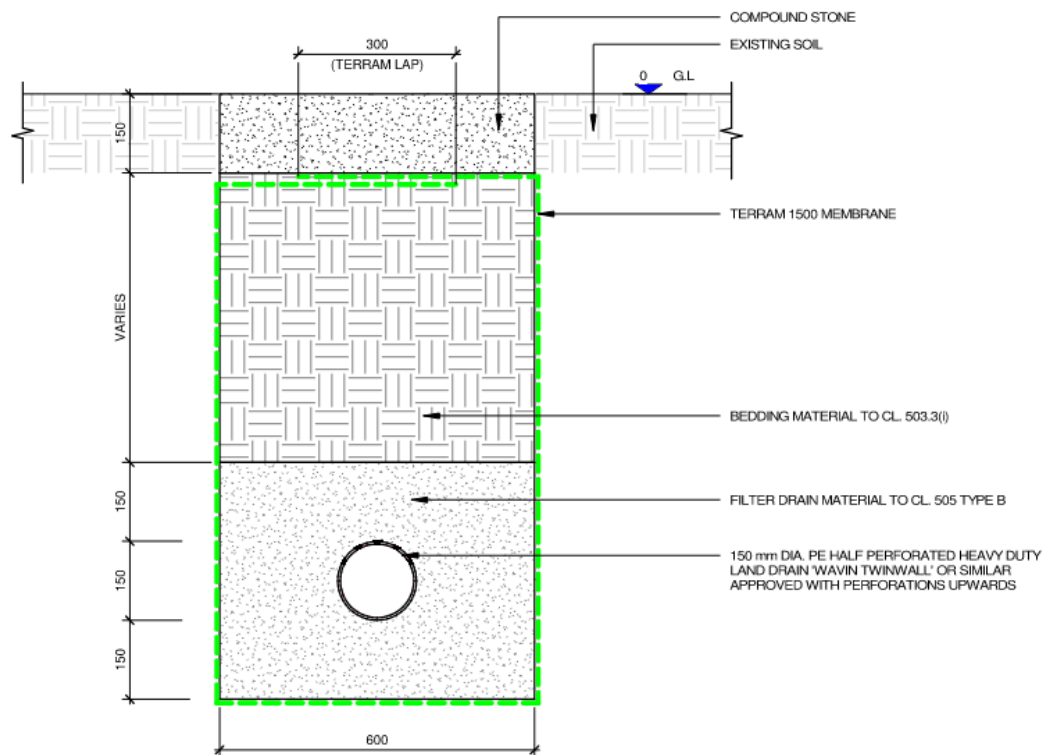
Drainage of site berms containing the excavated materials will be via French drains until the berms are vegetated. The berms will be surrounded by silt fencing until vegetated and stabilised. See example of silt fencing in Figure 3 below.



Figure 3 Silt Fencing

3.2.2 French Drains

- French drainage channels will collect water runoff from excavated soil stockpiles and will discharge to the dedicated settlement ponds constructed for both the construction phase and permanent works drainage. See French drain section Figure 4 on the next page.
- It is not envisaged that significant groundwater will be encountered as general excavation levels are above the water table levels identified in boreholes in the site investigation report.
- In the event of water being encountered in excavations, dewatering points will be constructed adjacent to excavations to draw down water levels. These will be formed using layers of geotextiles and stone to filter suspended solids. All water pumped will be via a silt bag into the French drain system prior to entering the settlement pond treatment system.



TYPICAL SECTION THROUGH LAND DRAIN
SCALE: 1 : 10

Figure 4 French drain Section

3.2.3 Settlement Ponds

Details outlining earthworks and construction of the settlement ponds are illustrated in Appendix 3 and figure 5 below.

- 8No. settlement ponds will be constructed on site at the commencement of the construction phase.
- One group of 4No. will be located northwest of the substation and 4No. located to the east of the compound.
- Ponds will be used to treat water arising from the development and excavation activities onsite.
- Pond construction works will be scheduled during a period of dry weather, if possible, to minimise water pumping, if required during pond construction, water will be pumped through temporary settlement tanks (Siltbuster or similar) to discharge and drain into the existing terrain (note discharge point will be a safe distance from any water course).
- The settlement ponds will be comprised of a system of check dams which will further divide the ponds in primary, secondary and tertiary ponds.
- The settlement ponds will be lined with a geotextile material on a bed of 20mm single sized clean stone of 50mm thickness.
- The settlement ponds will have a permanent water depth of 300mm and a combined treatment capacity of 180m³ with a treatment rate of 11 litres per minute.
- The permanent water depth and treatment volume can be increased during the construction phase in line with increasing silt generation.
- The ponds will provide suitable attenuation for a 1 in 100-year rainfall event consisting of 20mm rainfall per hour for the entire complex when complete.

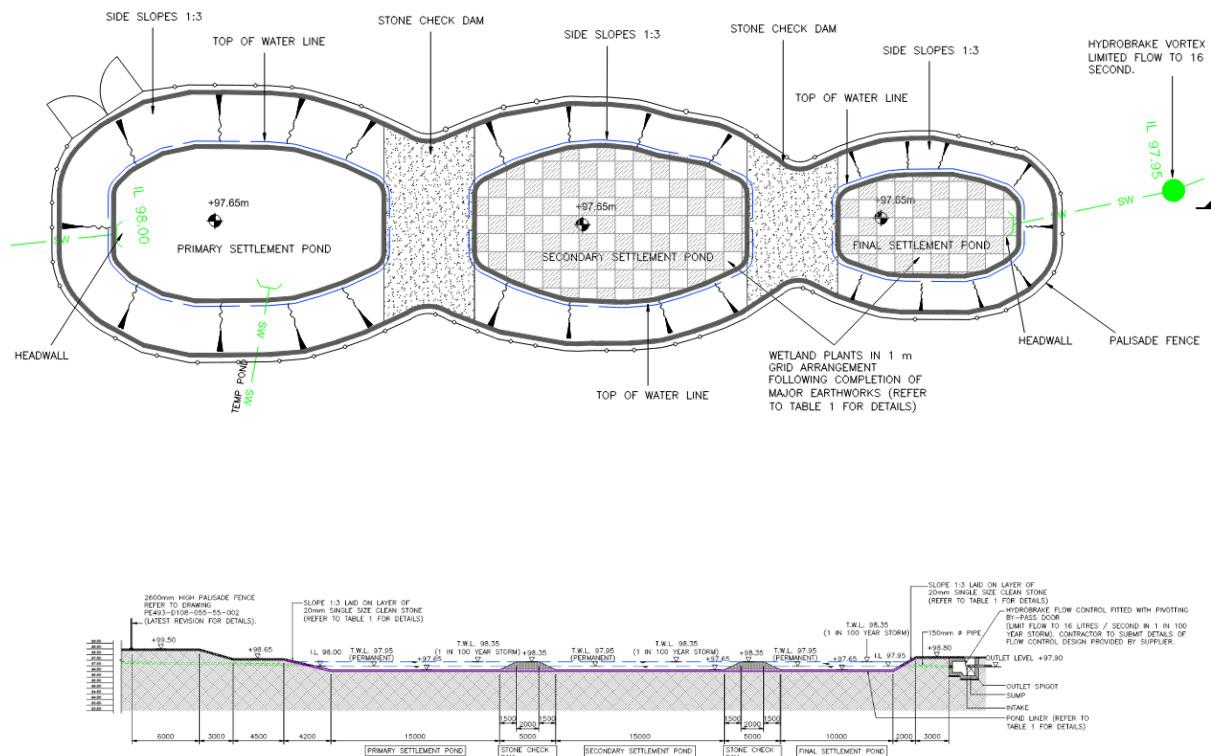


Figure 5 Permanent Settlement Pond Water Level and Settlement Pond Layout

3.2.4 Outfall Works

The outfall from the settlement ponds will discharge to their respective watercourse as shown on the drainage layout in Appendix 6. Methodology for installing these outfalls is as follows:

- Install silt curtains along the existing watercourse, downstream of the outfall location.
- Hand place 100mm cobbles to a depth of 300mm on the bed of the watercourse at the outfall location
- Install precast headwall at the outfall location: Carefully excavate the area in which the precast concrete headwall will be installed using a mechanical excavator, positioned on the bank thus avoiding the need for instream works.
- Surface vegetated scragh / surface curves will be carefully cut and removed to a temporary location for prompt reinstatement
- Excavate trench and install outfall pipework.
- Backfill trench and reinstate surface vegetated scragh/surface curves
- Outfall works shall only be performed during periods of dry weather, and under the supervision of the Project Ecologist.

3.2.5 Management and monitoring of Site drainage

Monitoring of site drainage will be carried out by the Site Manager as outlined below and tabulated in section 7: Monitoring Measures.

- The ponds and associated works (silt fencing, etc.) shall be checked/inspected daily as part of ongoing monitoring programme. Any required repairs made as soon as practicable.
- The frequency of visual inspections may be increased during period of excessive rainfall
- Sediment control infrastructure will be regularly maintained during the construction phase by cleaning of sediment ponds, repair of silt fences and vegetation in drains. This maintenance regime will ensure operation of sediment ponds maintaining water quality discharge.
- Natural water flow paths shall be monitored and redirected to settlement ponds if required, to

prevent direct entry into water course prior to treatment.

- Temporary drainage features, other drainage, silt traps etc. must be inspected regularly throughout the construction, operation and decommissioning phases to ensure they are clear and capable of performing their functions.
- Records of inspection and reports shall be maintained on site.
- Additional information on environmental management and water monitoring measures are included in sections 4,6 and 7.

Permanent drainage from all hard standings will be intercepted via an underground oil separator, which will separate oil from water.

3.3 Main Construction

Once the drainage systems are in place, the main construction shall commence. The main elements of the substation are summarised below and described in detail in the following subsections:

- 110kV GIS building
- 400kV GIS building
- 2 no. Transformers positioned in bund enclosures
- Associated compound and all other infrastructure contained within.

3.3.1 Construction of the new 400kV GIS building and 110 kV GIS building

The 110kV substation building is the first building to be constructed on site, as part of the Phase 1 works. It will be equipped with 8 bays consisting of 3 no. lines Athy, Portlaoise and Ballyragget, 2 no. transformers and 3 spare bays for future development. The building is constructed with in-situ concrete and structural steel with a combination of stone and insulated cladding finishes.

The following are features included in the building:

- The building substructure is a waterproofed cast in-situ raft foundation.
- The structure of the walls is a combination of in-situ concrete and structural steel,
- External Walls are constructed from precast insulated concrete sandwich panels with insulated cladding panels above.
- The external wall finishes are a combination of stone façade cladding and insulated cladding panels.
- The first floor is constructed with a composite floor with additional reinforced structural screed poured on top.
- The roof is constructed with an insulated cladding panel.
- A gantry crane is being installed in the building.

The 400kV substation is the second building to be constructed (phase 2 of the works). It is also equipped with 8 bays consisting of 2No. Lines, 1No. from Moneypoint and 1No. Dunstown, 2No. transformers and 4No. spare bays for future proofing the building. The building is constructed with in-situ concrete and structural steel with a combination of stone and insulated cladding finishes.

The following are features included in the building:

- The building substructure is a waterproofed cast in-situ raft foundation.
- The Structure of the walls is a combination of in-situ concrete and structural steel,
- The external walls are constructed from in-situ concrete with insulated cladding panels above.
- The External wall finishes are a combination of random rubble stone to concrete walls and insulated cladding panels.
- The first floor is constructed with a precast concrete slab and concrete screed.
- The roof is constructed with a precast concrete panel, insulation, concrete screed and roof

membrane.

- A gantry crane is being installed in the building.

3.3.2 Transformer bunds, foundations and fire walls

The transformer bunds are built on large rafts closed in on 3 sides, full height with a bund built on the remaining side to contain any leaks. The bund walls on 3 sides will be 12m in height, to protect the 400kV build in the event of fire.

Bund height on the lower side will be 750mm in height with a storage volume in excess of 200,000 litres for each transformer bay.

Foundation formation will involve a 2.6m deep excavation with a 1750mm layer of hardcore to underside of slab formation. Overall concrete base depth of the transformer bund will be 850mm.

3.3.3 Foundations

- The GIS Buildings and Transformer Bunds will be built utilising a raft foundation.
- The foundation will be constructed using the following methodology.
 - The area of the buildings will be marked out using ranging rods or wooden pegs and the soil stripped and removed to a temporary placement area for later use in landscaping.
 - No excavated material will be removed from site and the stockpile areas will be established with run off drainage as previous detailed.
 - All drainage measures in the detailed drainage design for the project will be implemented around the work area;
 - Any water arising from the excavation will be managed in accordance to section 3.2 above;
 - The foundations will be excavated down to the level indicated by the project engineer with excavation depths cognisant of any ground water vulnerability or constraints;
 - The foundations will be shuttered and steel reinforcement installed.
 - The foundation will be poured with concrete.

3.3.4 Installation of underground services

- Some of the services to be installed in trenching include:
 - Power and Communications ducts between Overhead Line structures and Substation buildings.
 - Telecommunications cabling to facilitate communication with control room
 - Water supply from site source to substation.
 - Drainage systems as described in section 3.2.
 - Wastewater holding tanks, chambers and oil separators
 - Substation Earth Grid
- All underground services are installed using standard trenching methods:
 - Survey area for existing services
 - Excavation of trenching with mechanical excavator down to the level indicated by the project engineer with excavation depths cognisant of any ground water vulnerability or constraints;
 - Installation of services/ducting/ chambers
 - Backfill and compaction of excavations.
 - Reinstatement of surface to existing condition or new specified surface finish.

3.4 Associated compound and all other infrastructure.

3.4.1 Permanent Substation compound fencing & gates

- Palisade Fencing will be installed around the substation compound according to the particulars of the planning application.
- Outer compound fencing will be installed around the site perimeter utilising post & rail or similar in accordance with the planning application.
- Fencing will be installed using standard installation methodologies.
- Excavation for fencing shall be carried out as follows:
 - Survey area for existing services prior to excavations.
 - Excavation for fenceposts remaining cognisant of any ground water vulnerability or constraints.
 - Installation of fenceposts and fencing elements.

3.4.2 Building Services installation

There is an extensive installation of mechanical and electrical services on this site, these will be undertaken by specialist subcontractors and completed on a phased basis during the project. The building services will be installed as part of these works.

The Electrical fit out of the GIS switchgear in each building shall be carried out under a separate contract as described in section 1.

3.4.3 Internal Building finishing works

Internal building wall finishes shall incorporate painted blockwork and concrete walls. GIS hall floor finishes shall comprise two coats of anti-slip paint.

3.4.4 Supply, installation & commissioning of gantry crane

- Gantry cranes which operate on runner beams are required to be installed in both buildings for lifting equipment during the electrical fit out of the building and the ongoing operation of the facility.
- These will be designed, manufactured, installed and commissioned by a specialist engineering company.

3.4.5 Landscaping

- The project, once complete, will be landscaped in accordance with the landscape plan submitted as part of the planning application.
- This will include the vegetation establishment on topsoil berms created by the excavation for the substation works.
- Native Irish Trees and vegetation shall be used for any revegetation/ planting.
- Once the project is complete, settlement ponds will be cleaned and geotextile removed. The permanent lining and features will then be installed prior to seeding.

4 ENVIRONMENTAL MANAGEMENT

This section of the CEMP provides an overview of the Environmental Management proposals which will be implemented during the construction phase of the permitted development.

The following sections give an overview of the water protection and management, earthworks management, dust and noise control measures, refuelling and concrete control and a waste management plan for the site.

4.1 Water Protection and Management

The detailed drainage design (Section 3.2) will specify all materials and equipment required to implement the drainage measures effectively. This equipment will be brought to site in advance of any works commencing. An adequate quantity of all required materials will be kept on site at all times to implement the detailed drainage design. The drainage measures will be installed prior to, or at the same time as the works they are intended to drain. The works programme for the groundworks element of the construction phase of the project will also take account of weather forecasts and predicted rainfall. Large excavations and movements of overburden or large-scale overburden or soil stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

The detailed drainage design prepared for the site provides for the management of drainage on site. The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the Environmental Manager.

The Environmental Manager will monitor the effectiveness of on-site drainage and identify any measures that may be required due to varying weather and on site conditions. In the event that works may cause potential runoff in watercourses, the Environmental Manager will have the necessary authority to instruct the Site Manager to stop all works in the immediate area around where runoff is evident. The source of the runoff will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.

4.1.1 Equipment Required in the Event of Emergency Contamination

An Emergency Response Plan has been prepared which sets out procedures to be implemented in the event of an accidental discharge to the environment. This is available in Appendix 7 for Emergency Response Plan. The ERP will be displayed on site and operatives will be briefed on the plan via Induction / Toolbox talks.

Equipment required in the event of an emergency environmental event will be stored on site.

All personnel will be trained in the use and application of these temporary emergency measures which may involve the following:

- The use of impermeable matting such as plastic sheeting.
- Erection and inspection of silt fencing.
- Installation and inspection of a silt sock system
- All personnel will be trained and made aware of procedures for the actions to be taken in the event of an environmental emergency as part of site induction and routine toolbox talks.

4.2 Earthworks Management

Site excavations will be undertaken during the construction phase to facilitate the construction of the project elements described in Section 3. The construction methodologies provide details of the site excavation and earthworks. This section provides further details on the earthworks and spoil management which are outlined as follows:

- Soils excavated during construction will be stockpiled permanently forming berms, not exceeding 3m in height.
- Drainage protection measures such as the drainage ponds and French drains will be constructed prior to substation and road construction. This approach will be used in combination with the installation of other drainage protection measures in advance of construction, such as the installation of silt fencing.
- All temporary cuts/excavations will be carried out such that they are stable or adequately supported. Where appropriate and necessary, cuts and excavations will be protected against ingress of water or erosion using cut off drains around the excavation works. Temporary works will be such that they do not adversely interfere with existing drainage channels/regimes.
- Plant and materials will be stored in approved locations only (such as the site compounds) and will not be positioned or trafficked in a manner that would surcharge existing or newly formed slopes.
- No excavated topsoil and subsoil will leave site, all will be used to form the permanent site berms.

During the construction phase the mitigation measures for soil and geology are presented below:

- In so far as practicable, compaction of any soil or subsoil which is not being altered will be avoided.
- Stockpiled topsoil from on-site excavation works not to exceed 3m in height.
- Repeated handling of soil will be avoided and ideally all soil stockpiles will remain undisturbed pending later re-use.
- Construction traffic within the site will be required to follow designated routes.
- Minimising excavation and stockpiling activities during wet weather periods
- Shaping stockpiles of excavated soil and/or subsoil and sealing with the excavator bucket.
- Installation of the appropriate drainage measures as set out in Section 3.2 prior to the commencement of works where practicable.

4.2.1 Air Quality and Dust Management

In periods of extended dry weather, dust suppression may be necessary within the site compound and access road to minimise the nuisance risk. Dust suppression control measures to be implemented are listed below:

- If required water will be abstracted from settlement ponds in the site construction drainage system and pumped into a bowser to dampen down the internal access road and site compounds to prevent the generation of dust.
- Water bowser movements will be carefully monitored in order to avoid the excessive usage of water which may exceed the requirement.
- A policy of “clean off site” will be implemented, whereby no vehicle will be permitted to leave site with spoil or dirt present on the vehicle. This policy will be enabled in the first instance by having appropriate, designated and clean haul routes around site. All vehicles, when leaving site will be inspected by gateman for cleanliness. If the vehicle cleanliness is deemed unacceptable, the vehicle will pass through the wheel wash area.
- All roads and access routes will be inspected frequently by the site management - records of inspection shall be kept on site.
- If required, a road sweeper and water bowser will be deployed to clean and spray the local roads with water during dry periods when there is a risk of dust nuisance.
- Weather data will be obtained from the met Eireann station situated at Oak Park, Co, Carlow. Daily conditions are also noted as well as any weather warning in place.

- Dust monitoring will be set up at neighbouring residence (approx. 800m from site) and monitored on a continuous basis. Dust levels will be measured against current EPA Licence threshold limits (350 mg/m²/day) using the Bergerhoff Method. Dust results are reported in the Monthly Environmental Monitoring Report.

4.3 Refuelling

The construction phase of the permitted development will require the use of plant and equipment which will utilise hydrocarbons. To minimise the potential risk of contamination from refuelling or general fuel management the following controls will be put in place:

- Minimal fuel and oil quantities will be stored on site.
- To reduce the likelihood of leaks, all plant will be inspected prior to entry on site.
- Construction equipment refuelling will be in designated refuelling areas, which will be a minimum of 25m away from adjacent watercourses.
- Storing fuels, chemicals, liquid and solid waste on impermeable surfaces in suitable containers.
- Refuelling will only be carried out using double bunded mobile bowsers. Bowsers will be inspected weekly, prior to use. The refuelling bower will be operated only by designated, trained personnel. Spill kit equipment will accompany the bower, a drip tray will be used when refuelling.
- Plant, site vehicles and machinery will have a completed daily prestart check list
- Plant observed to have oil leaks will be immediately removed from site.
- Spill kits will be placed in a number of key locations within the site.
- Any fuel containers will be stored within a secondary containment system e.g. bund for static tanks or a drip tray for mobile stores.
- Site induction will contain actions to be taken in the event of an oil leak and details of who to contact in the event of a spillage will be circulated.
- In the event of contaminated soil being identified all works in the area local to the contamination will be stopped immediately and the procedures set out in the ERP will be followed.

4.4 Concrete Control and Management

Any concrete pours will be planned in advance. Special procedures will be adopted in advance of and during all concrete pours to minimise the risk of pollution. These may include:

- Ensure that excavations are water free before concrete works commence.
- Review of the weather forecast to assist in planning concrete pours
- Avoid large pours where prolonged periods of inclement weather conditions are forecast or persist.
- Ensure that covers are available for freshly placed concrete to avoid runoff to proximal receptors during inclement weather conditions.
- There will be no batching of concrete on the site. All concrete will come from a licenced supplier with appropriate certification and insurance.
- No washing out of concrete supply trucks will be allowed on the site with the exception of their chutes being brushed.
- The method for chute wash out is as follows:
 - A 12-yard skip on a suitable area of hardstanding.
 - A layer of sand will be placed on the bottom of the skip.
 - The skip will then be lined with a layer of heavy-duty polythene.
 - Concrete delivery vehicles will then be permitted to reverse up to skip and wash out their chute (only) into the washout skip.
 - Water levels in the skip will be monitored daily.
 - Skip will be covered as required during periods of heavy rainfall.
 - As skip reaches capacity the “Washout water” from will be pumped into an empty concrete delivery vehicle to be returned to the concrete supplier, where this water will be

reused in the batching process.

To reduce the potential for cementitious material entering watercourses, concrete pours will be supervised by Site Manager. The following mitigation will be adopted:

- The Site Manager will ensure that the area of the pour is completely drained of water prior to pour commencement.
- Pours will not take place during forecasted rainfall.
- Incidental rainfall from light showers during the period of a pour is typically absorbed into the concrete matrix but heavier showers can result in some run off from the top surface of the concrete pour.
- In the event of a spill within the immediate vicinity of drainage ponds or French drains, the pond outfall will be temporarily blocked and the pH levels of the water will be monitored. Any spillage will be cleared immediately and deposited in the chute wash down area.
- During the pouring of concrete, effective containment measures will be implemented to avoid spilling concrete outside construction areas and to prevent concrete entering any drainage system.
- To reduce the potential for cementitious material entering watercourses, concrete pours will be supervised by the site manager.
- Wet concrete operations are not envisaged for this site within or adjacent to watercourses or aquatic zones. However, if wet concrete operations are required in such locations, a suitable risk assessment will be completed by the environmental manager.
- Clearly visible signs will be placed in prominent locations close to concrete pour areas, stating that washout of concrete lorries is not permitted on the site.
- Temporary storage of cement bound granular mixtures will be on hardcore areas.
- Cement products are hazardous and should always be stored in a COSHH store or similar (shipping container), and only be in the open when in use. If cement products are temporarily located in the open, then they will be located within an impermeable bunded area and covered to prevent contact with rainwater. This will prevent direct drainage of cement storage areas to surface waters. Bunding will be in the form of sandbags or silt fencing.

4.5 Noise and Vibration

The use of mechanical tools, general construction activities, and the movement of vehicles servicing the site has the potential to generate noise and vibration during the construction phase of the permitted development.

The following general mitigation measures are considered appropriate for the permitted development during the construction phase:

- Plant will be used in an appropriate manner with respect to minimising noise emissions.
- All plant used will be modern, well maintained and working properly.
- Low noise emitting plant will be selected where appropriate.
- Avoid idling engines. Engines will be switched off when not in use.
- Plant will be used in an appropriate manner with respect to minimising noise emissions.
- Reduced speed limits will be imposed along the access roads and within the construction site.
- Noise and vibration monitoring will be undertaken on an ongoing basis at the nearest sensitive receptor (approx. 800m) from site.
- The noise monitoring will utilise a Larson Davis LXT Precision integrating Sound Level Analyser, wind shield and microphone stand set up at the agreed Nearest Sensitive Location. The monitoring will comprise:

- Measurement of ambient noise levels measured during good weather conditions using instruments of Class 1 specification.
 - Weather variables including rainfall and wind speed will be recorded for the duration of the survey.
 - The apparatus will be left in place and data collated and reviewed periodically.
- The vibration monitoring will utilise a Micromate vibration monitor and protection case which will be installed at the agreed Nearest Sensitive Location.
 - Ground conditions will be analysed and a ground level check will be carried out before measurement commences.
 - The vibration monitor will be fitted with an alarm which will alert personnel if vibration thresholds are exceeded.
 - The apparatus will be left in place and data collated and reviewed periodically.

4.6 Traffic Management

The access road is approximately 1.5km from the R426 (public road) to the substation compound gates. Appropriate signage will be maintained for the duration of the project with clear warning signage installed along the R426 Local Road on approach to the site entrance.

Construction traffic to site will include:

- Cars and vans associated with on-site construction personnel commuting to work.
- HGVs transporting plant/machinery, construction materials, including concrete, stone, building materials, drainage/ducting materials, structural steel, cabling, site boundary fencing and electrical components, etc.
- All vehicle movements within the site will be controlled.
- No permitted parking of vehicles on the public road.

4.7 Ecology Management

Section 2 provides details on the existing ecological environment of the site. Some protection measures to maintain ecological biodiversity with regard to natural occurring habitat on site are as follows:

- The project ecologist will be employed during the construction phase of the project. Duties will include the review of all method statements, delivery of toolbox talks and monitoring of construction phase to ensure that all environmental controls and mitigation measures are implemented.
- Spraying of vegetation using pesticides will be strictly prohibited.
- Habitat disturbance e.g. vegetation rutting, will be limited by controlling the movement of maintenance vehicles. Construction vehicles will not encroach onto habitats beyond the permitted footprint.
- In the event that protected mammal/amphibian species, or their active habitats are found during the construction phase, works will cease immediately and the area will be cordoned off until advice is sought from a suitably qualified specialist.
- Where confirmatory pre-construction surveys confirm nesting birds are present, an exclusion zone will be established around the nesting bird (to include the risk of abandonment due to indirect disturbance), and no vegetation clearance will proceed until young are presumed to have fledged, or nesting has failed.

The regular ecology site walkovers will also give consideration to protected volant/non volant mammals, birds and amphibians outlined below:

- Amphibians
- Badger (*Meles meles*);

- Bats;
- Birds;
- Otter (*Lutra lutra*);
- Viviparous lizard (*Zootoca vivipara*); and
- Invasive non-native species (INNS), both plant and animal findings of the above are included within this report.

The following minimum standards will be followed to prevent ecological impacts occurring outside the works area:

- Measures taken to prevent the spread of suspended solids (including vegetative material) into the watercourse from the permitted works;
- Measures will be taken to prevent dust and other emissions from construction affecting land/water beyond the permitted works area;
- Chemicals and fuels should be stored in secure containers located away from watercourses or water bodies. Spill kits will be available;
- Noise and vibration will be controlled and kept to the minimum necessary;
- Lighting used for construction will be switched off when not in use and positioned so as not to spill on to adjacent land or retained vegetation within the Site; and
- An area of ecological sensitivity has been identified on site (Appendix 6 ESB Drainage Drawing). This area will be fenced off before construction works commence.

4.7.1 Invasive Species

There were no invasive plant species identified as part of the recent site walkovers. However, to ensure the site remains free of such invasive species, ecological site walkovers will be conducted on a monthly basis and an inspection for invasive species will form part of the environmental audit. If identified, invasive species will be managed as per an Invasive Species Management Plan which will be prepared in the event of such a situation arising.

Some mitigation and preventative measures for the control of invasive species include:

- Invasive species awareness to be included in all personnel site induction which will include training using the Environmental Management Procedures in Appendix 8 EMP.
- All equipment and vehicles will be visually inspected for evidence of attached plant material, mud and debris. This will be undertaken before entering and leaving the site. Any attached or adherent material will be removed before leaving the site.
- If suspected invasive species are encountered, the materials containing these species will be quarantined and disposed of to a fully permitted facility and transported by a licenced contractor. Records of findings will be kept, this will include species identity, location and source. Disposal will be recorded in the Resource and Waste Management Plan.

4.8 Waste Management

A Resource and Waste Management Plan will be in place for the project – see Appendix 5. This plan details projected waste streams and avenues for disposal.

The key waste management proposals for the site include:

- The provision of a Waste Storage Area on site that will hold waste skips. Individually labelled skips will be provided for each category of waste and these will be emptied regularly.
- All project waste will be recorded in the Resource and Waste Management Plan. This document will be made available for all personnel and will be located in the site compound office.

- It is not intended to remove any soils/excavated material from site unless they are found to be contaminated or contain invasive species. In this scenario, the materials will be quarantined in a suitable storage container and transported to a fully permitted facility by a licensed contractor for treatment or disposal. See Figure 6 below.

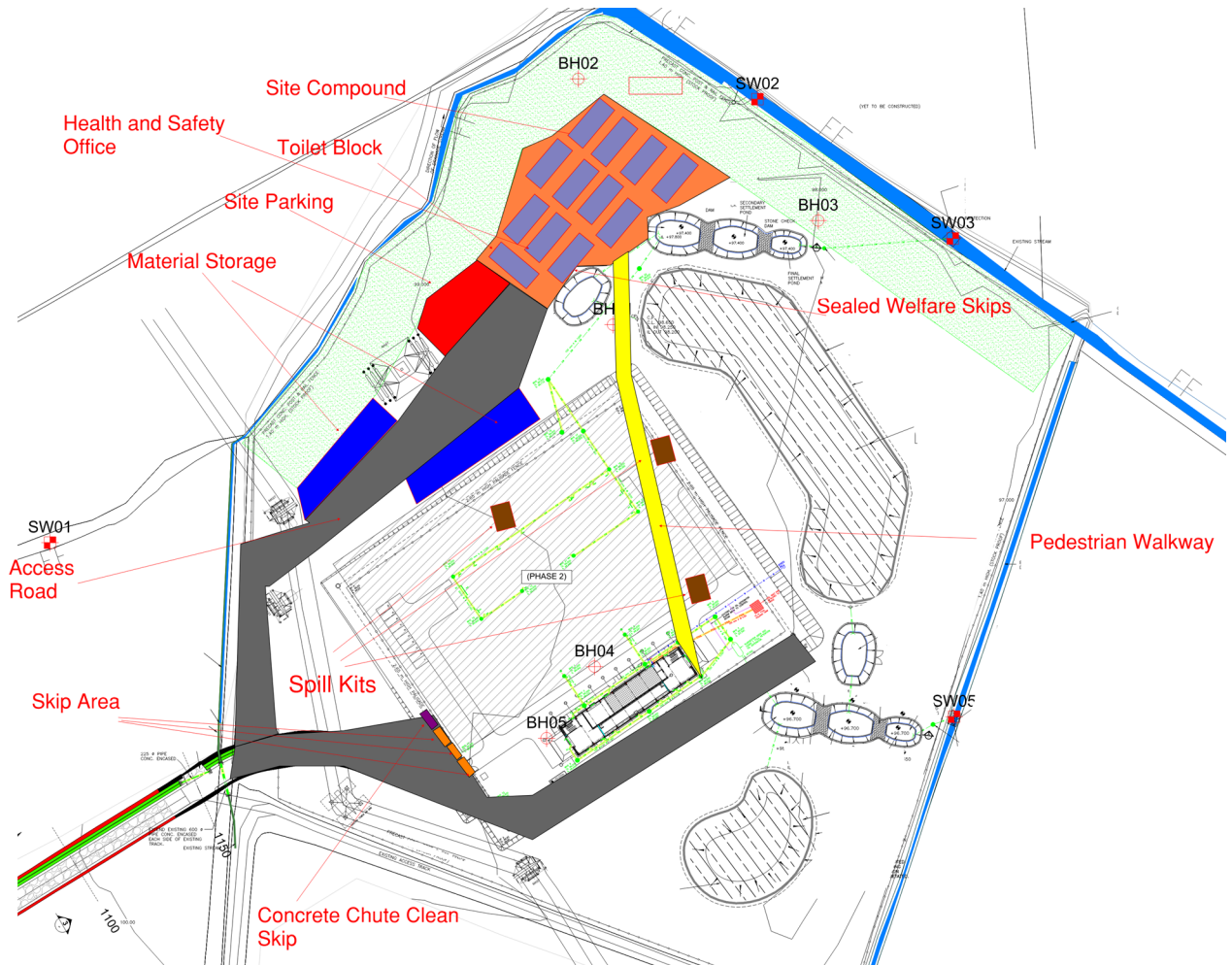


Figure 6 Waste Control Area

- All waste removed off site shall be completed by a waste contractor with suitable licences and permits to the approval of the Engineer and the relevant local authority. Permit details will be included and maintained in the on-site Environmental Management Plan.

5 IMPLEMENTATION OF CEMP

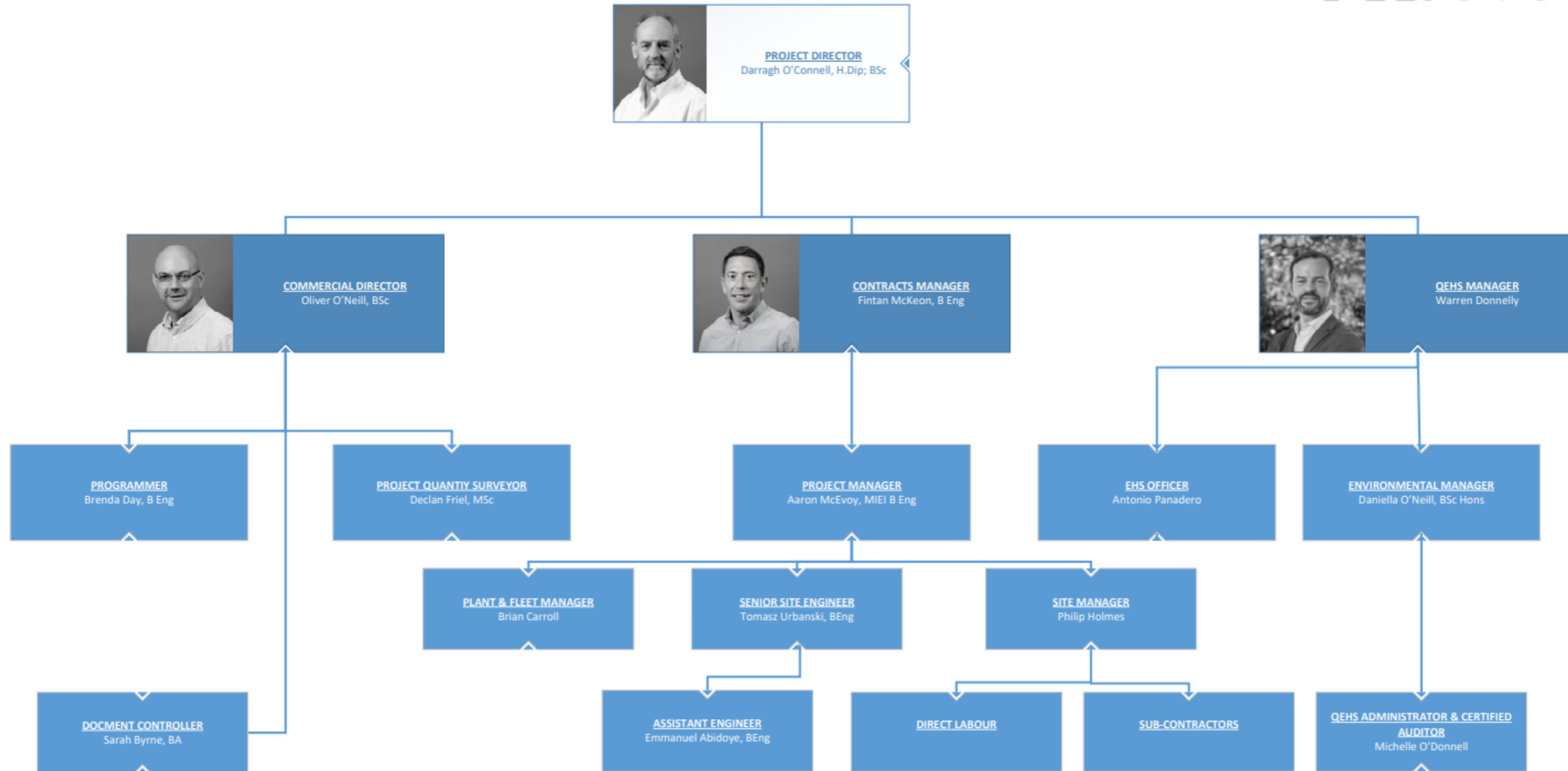
This section of the CEMP provides an overview of the Roles and Responsibilities of the project team and tasks to be undertaken in implementation of the CEMP

5.1 Project Organisational Structure and Responsibilities

The Organisational Structure for the Kilwex Ltd project team is displayed in figure 7 on the next page:

This organogram defines the positions of the project team with the relevant reporting structures detailed.

Figure 7 Organisational Chart



The project team will include an overall Project Manager, whose duties will stretch beyond the day-to-day works to budgetary, procurement and scheduling matters. The Site Manager will report to the Project Manager and will have overall responsibility for the managing the construction site personnel carrying out the works.

An Environmental Manager will be employed for the duration of the works and will report to the Project Manager. The Site Manager will communicate on an on-going basis with the Environmental Manager to ensure mitigation measures are applied for specific works. The roles and responsibilities for key project team members are provided in detail in Section 5.3.

5.2 Site Induction & Toolbox Talks

Prior to commencement of any works on site, all personnel visiting or working on site shall receive a site induction. The induction process will outline works, the site rules and will ensure that all personnel have the correct information to carry out their work in a safe manner.

The induction will include key environmental management measures to be adhered to, including the following:

- Sensitive ecological areas (buffer zones) where personnel will have no access as it will be a fenced-off area.
- The storage of fuel, oil and other hydrocarbons and refuelling operations.
- Waste management.
- Earthworks – control of dust, use of settlement ponds, etc.
- Noise minimisation.
- Awareness of responsibilities in relation to neighbouring properties.
- Ecology matters, including invasive species.
- Responsibility of the workforce to report any concerns relating to environmental issues.
- Incident notification in the event of an environmental incident, including emergency response, spill management, etc. All personnel will be provided with the necessary familiarisation to understand the actions required in the case of an environmental emergency and how to promptly report and respond to potential environmental emergencies.

The site induction will include this information in a PowerPoint presentation presented by a member of the site management team to inductees prior to any person commencing work on site. The induction will clearly display the plan drawing depicting the buffer zone installed to restrict access to protect the sensitive ecological areas, i.e., the streams to the north of the site.

Toolbox talks on environmental matters using information from the Environmental Management Procedures, shall be used to raise awareness of environmental management for the project. These toolbox talks will be specific to the permitted development and will explain topics such as project-specific mitigation measures, emergency response procedures, waste management, concrete works, environmental awareness relating to the sensitivity of the watercourses, ecological exclusion zone, among others.

The relevant Environmental Management Procedures (EMP's) included in Appendix 8 will provide the necessary information for environmental toolbox talks and site inductions. Information will be utilised from the Environmental Management Procedures to train site personnel to undertake specific ecologically sensitive tasks such as refuelling etc.

5.3 Roles and Responsibilities

The general key personnel on site implementing the CEMP are listed below with roles and responsibilities detailed in the following sections:

- Project Manager
- Site Manager
- Environmental Manager
- Project Ecologist
- Project Archaeologist.

5.3.1 Project Manager

The Project Manager is appointed by the contractor to manage and oversee the entire project. The Project Manager is responsible for:

- Implementing the Construction and Environmental Management Plan (CEMP)
- Implementing the Safety and Health Plan.
- Management of the construction project.
- Liaison with the client/developer.
- Liaison with the project team.
- Assigning duties and responsibilities in relation to the CEMP
- Production of construction schedule.
- Materials procurement.
- Maintaining a site project diary.

5.3.2 Site Manager

The Site Manager manages all the works to construct the project, on behalf of the contractor. The Site Manager reports to the Project Manager. In relation to the environmental management, the Site Manager is responsible for:

- Ensure all operatives/personnel are inducted prior to commencing works on site. The induction process will include requirements of CEMP
- Ensure all works are carried out by operatives with relevant competency.
- Ensure all risk assessment / method statements cover requirements of CEMP where applicable.
- Ensure all actions/requirements of CEMP are put in place
- Supervise and monitor works to ensure compliance with CEMP.
- Ensure all plant and equipment daily checks and inspections are carried out and records are updated and filed on site.
- Issue / complete toolbox talks and training as required.
- Ensure all monitoring is carried out as specified in CEMP. Liaising with the Environmental Manager in preparing site-specific method statements for all works activities where there is a risk of environmental impact, by incorporating relevant mitigation measures.
- Measures and referring to relevant Environmental Control Measure Sheets.
- Liaising with the Environmental Manager where third party agreement is required in relation to site-specific Method Statements, Environmental Control Measures and/or Environmental Control Measure Sheets.

Other general duties will include:

- Awareness of all projects environmental commitments and requirements.
- Ensuring that all relevant information on project programming, timing, construction methodology, etc., is communicated from the Project Manager and to the Environmental Manager in a timely and efficient manner in order to allow pre-emptive actions relating to the environment to be taken where required.
- Programming and planning of excavation works and communicating this schedule to the Environmental Manager.

- Ensuring that adequate resources are provided to design and install any environmental interventions.
- Liaising with the Design Engineer and providing information on environmental management to the Design Engineer during the course of the construction phase.
- Liaising with the project team in assigning duties and responsibilities in relation to the CEMP to individual members of contractor's project staff.
- Ensuring that the Environmental Manager performs regular and frequent environmental site inspections.

5.3.3 Environmental Manager

The Environmental Manager is a critical role on the permitted development to ensure the implementation of environmental best practice. Their duties shall include the following:

- Being familiar with the project environmental requirements and baseline data gathered for the various environmental assessments and during pre-construction surveys.
- Liaising with the project team in assigning duties and responsibilities in relation to the CEMP to the project team.
- Completion of documented environmental audits to ensure that work is being carried out in accordance with environmental mitigation measures and method statements, etc.
- Ensuring that the findings of all audits and inspections are addressed in a timely manner.
- Liaising with the Site Manager to ensure that the control measures set out in the Schedule of Environmental Mitigation are implemented.
- Liaising with the client, Ecological Clerk of Works, specialist consultant etc. in relation to environmental issues.
- Reviewing the surface water management system which will include daily inspections. See Section 7 Monitoring Measures.
- Reviewing the management of waste on site.
- Installation of monitoring equipment and maintenance and management of same.
- Ensuring that site inductions and toolbox talks contain the relevant environmental information and reviewing the effectiveness of the induction process to ensure that site staff have received suitable awareness training.
- Assisting the project team with the review and production of method statements and risk assessments where there is a risk of environmental impact.
- Carrying out an investigation and producing a report regarding all environmental incidents. The report of the incident and details of remedial actions taken shall be made available to the relevant authority, the project team and to the ESB Environmental support.
- Ensuring that Environmental Emergency Response Plan remains fit for purpose and is communicated with project team. Having emergency arrangements tested via periodic emergency drills.
- Overseeing the review and updating of the CEMP and all project environmental, documentation (e.g. Resource and Waste Management Plan) in light of findings from site audits and inspections, monitoring results, consultation with third parties, legislative changes, etc.
- Ensuring that all relevant works are being carried out in accordance with current environmental legislation, required permits, licences, planning permissions, etc.
- Procuring the services of specialist environmental contractors and coordinating their activities. Ensuring that these contractors are suitably competent and adequately resourced and coordinating all communications between the contractors and relevant project team members.
- Liaising and instructing the site manager to cease works in the event of a runoff issue at the watercourse. Advising the site team on rectification measures of runoff in river.
- Make suggestions in relation to onsite drainage changes to better suit the ecology of the site in agreement with Resident Engineer.

Third Party Consultations

- The Environmental Manager will oversee and coordinate consultations with third parties as required. A list of relevant third party consultations is included in Section 5.4.3. This may include Laois County Council, the EPA, and any other relevant statutory body.
- Liaising with all prescribed bodies during site visits, inspections and consultations.

5.3.4 Project Ecologist

The Ecologist will be responsible for:

- The effective implementation of ecological mitigation measures as detailed in the EIS & NIS.
- Undertaking pre-construction walkover surveys.
- Liaising with the National Parks & Wildlife and local authority on applicable wildlife licensing procedures as required.
- Carrying out site inspections.
- Liaising with Site Management and personnel as required. Presenting toolbox talks on ecological using information ecological reporting previously completed. See Appendix 9 Walkover Report, Appendix 10 Denyer Ecology Report and Appendix 11 IE Consulting Report.

5.3.5 Project Archaeologist

An Archaeologist will be responsible for:

- Monitoring of earthworks associated with the development.
- Ensuring implementation of archaeological mitigation measures.
- Liaising with the Environmental Manager / Site Manager.
- Liaising with the Project Manager / Client.
- Participating in relevant toolbox talks.
- Supervising all topsoil stripping works onto the surface of the underlying geological-derived subsoils.
- Ensuring that all topsoil will be removed by mechanical excavators fitted with wide, toothless grading buckets.
- Ensuring that in the event that subsurface remains of archaeological interest/potential are uncovered during earthworks, then works in the immediate area will cease, pending investigations by the appointed archaeologist and consultation with the National Monuments Service, Department of Housing, Local Government and Heritage (as required).
- Producing a report describing the results of the programme of Archaeological Monitoring and any other archaeological interventions that might be required.

5.3.6 All Personnel

All site personnel are responsible for:

- Adhering to the relevant Environmental Control Measures and relevant site-specific Method Statements.
- Adhering to the Safety and Health Plan, CEMP, Resource Waste Management Plan and the Environmental Emergency Response Plan
- Reporting immediately to the Environmental Manager and Site Manager any incidents where there has been an environmental incident . This may include a spillage of a potentially environmentally harmful substance, an unauthorised discharge to ground, water or air or damage to a protected habitat, etc.
- Participating in induction and toolbox talks as detailed in section 5.2.
- All personnel will participate in toolbox talks in relation to information derived from the Environmental Management Procedures.

5.4 Contacts

5.4.1 Main Contractor Contacts - Kilwex Ltd

*24-hour contact details

Position Title:	Name:	Phone:	Email:
Main Contractor	Kilwex Ltd.	045 889 479	civileng@kilwex.ie
Project Manager	Aaron McEvoy	086 103 4052	aaron.mcevoy@kilwex.ie
Site Manager*	Philip Holmes	086 0842195	philip.holmes@kilwex.ie
Environmental Manager	Daniella O'Neill	086 8427748	daniella@coyleenv.ie
Health and Safety Contact (PSCS)*	Aaron McEvoy	086 1034052	aaron.mcevoy@kilwex.ie
SHEQ Manager	Warren Donnelly	086 858 7795	warren.donnelly@kilwex.ie
EHS Advisor*	Antonio Panadero	086 035 5194	antonio.panadero@kilwex.ie
Site Emergency Number*	Aaron McEvoy	086 103 4052	aaron.mcevoy@kilwex.ie
Project Archaeologist	Martin Byrne	087 262 4954	martinbyrne1063@gmail.com
Overall Project PSDP	Patrick Graham	087 418 5317	patrick.graham@esb.ie

Table 1 Contact Details for Main Contractor Kilwex Ltd .

Please see Kilwex Project Organisational Chart in Appendix 12.

5.4.2 ESB Contacts

Position:	Name:	Phone:	Email:
ESB Project Manager	Aoife Heneghan	0879822952	aoife.heneghan@esb.ie
ESB Environmental Specialist	Lorna Conway	0879202428	lorna.conway@esb.ie

Table 2 ESB Contacts

5.4.3 Third Party Contacts

Organisation:	Position:	Name:	Phone:	Email Address:
Inland Fisheries Ireland	Eastern River Basin District	Dublin Regional Office	(01) 2787022	blackrock@fisheriesireland.ie
National Parks and Wildlife Service	North – Eastern Region	District Conservation Officer	(076) 1002594	nature.conservation@chg.gov.ie
Environmental Protection Agency (EPA)	EPA	EPA Headquarters	(053) 9160600	info@epa.ie
Local Authority	Laois County Council	Laois County Council Headquarters	(057) 866 4000	corpaffairs@laoiscoco.ie
Department of Culture, Heritage and the Gaeltacht	National Monuments Service	Custom House, Dublin	(01) 8882000	nationalmonuments@chg.gov.ie
Health and Safety Authority	Health and Safety Authority	Head Office, James Joyce Street, Dublin 1	(01) 6147000	wcu@hsa.ie
Emergency Services	An Garda Síochána	Stradale Garda#	(057) 8625222	-
Emergency Services	Ambulance and Fire Service	Ambulance and Fire Service	999 or 112	-

Table 3 Third Party Contact

6 MITIGATION MEASURES

This section of the CEMP groups together all of the mitigation measures presented in the Environmental Impact Statement (EIS) and a Natura Impact Statement (NIS) prepared as part of the planning permission application to An Bord Pleanála.

By presenting the mitigation proposals in the below format, it is intended to provide an easy-to-audit list that can be reviewed and reported on during the future phases of the project. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits. Please see table 4 Mitigation Measures below.

Table 4 Mitigation Measure

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
Pre-Commencement Phase					
MM1	EIS - Chapter 2 Introduction	2.6 Construction Methodology	It should be noted that prior to commencement of works the contractor(s) will prepare a Construction and Environmental Management Plan (CEMP - see Section 2.11) which will include method statements and work programmes that show more detailed phasing of work;		
MM2	EIS - Chapter 2 Introduction	2.6 Construction Methodology	The CEMP produced by the contractor(s) will be agreed with the appropriate authorities.		
MM3	EIS - Chapter 7 Cultural Heritage	7.5.1 Unit 1	Given the presence of crop marked field systems (both recorded monuments and new sites – see Sections 0 and 7.3.1.2.3) within proximity to the substation site, it is recommended that the proposed substation site be archaeologically tested prior to the commencement of construction. The use of geophysical survey should also be considered at the earliest stage possible in order to detect previously unknown sites of potential. A report outlining the results of the testing will be submitted to the DAHG and the National Museum for consideration. Should archaeological finds or features be uncovered during the testing preservation in situ, preservation by record (excavation) or further monitoring of ground works may be required.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM4	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<p><u>Mitigation by remedy</u></p> <p>Whilst the avoidance of sensitive areas is the primary means of reducing the potential impacts, further measures will aim to address unavoidable or unforeseen impacts. A Construction and Environmental Management Plan (CEMP) will be drawn up and implemented during the course of construction to remediate the potential negative impacts. This plan shall incorporate the mitigation measures indicated in the EIS, and any others deemed necessary, and shall provide details of intended construction practice for the proposed development, including the following which are of relevance to ecology:</p> <ul style="list-style-type: none"> a) details of site security fencing and hoardings, b) details of on-site car parking facilities for site workers during the course of construction, c) details of the timing and routing of construction traffic to and from the construction site and associated directional signage, to include proposals to facilitate the delivery of abnormal loads to the site, d) measures to obviate queuing of construction traffic on the adjoining road network, e) measures to prevent the spillage or deposit of clay, rubble or other debris on the public road network, f) alternative arrangements to be put in place for pedestrians and vehicles in the case of the closure of any public road during the course of site development works, g) details of appropriate mitigation measures for noise, dust and vibration, and monitoring of such levels, h) Measures adopted during construction to prevent the spread of invasive species (such as Japanese Knotweed) <p>Monitoring of the construction phase shall be carried out by an environmental engineer and an ecologist each of whom shall be appropriately qualified and experienced, to ensure that all mitigation measures contained in the CEMP are implemented.</p>		
MM5	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<p>Ongoing water monitoring at the discharge points and the receiving waters will be a key indicator of the effectiveness of the erosion and settlement control measures and the requirement for corrective action or the deployment of additional measures as outlined above. Methods, frequency and parameters to be monitored will be discussed and agreement sought with Inland Fisheries Ireland and National Parks and Wildlife Service prior to construction commencing.</p>		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM6	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5 Mitigation	<p>A project-specific Construction and Environmental Management Plan (CEMP) will be established and maintained by the contractors during the construction and operational phases of the proposed Project. The Plan will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures. As a minimum, the manual will be formulated in consideration of the standard best international practice including but not limited to:</p> <ul style="list-style-type: none"> • National Roads Authority (NRA), Guidelines for the Crossing of Watercourses during the Construction of National Road Line routes.²¹ • NRA (2008) Guidelines and Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Roads Schemes. Dublin: National Roads Authority.²² • Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005²³ • BPGCS005, Oil Storage Guidelines.²⁴ • Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. ²⁵ • CIRIA 697, The SUDS Manual, 2007.²⁶ • CIRIA Control of water pollution from linear construction projects. Technical guidance (C648), 2006²⁷ • CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors²⁸ • UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004²⁹ • The Forest Service (2000), Forest and Water Quality Guidelines, Department of the Marine and Natural Resources.³⁰ 		
MM7	EIS - Chapter 2 Introduction	2.6 Construction Methodology	<p>It is proposed that 8 separate settlement/attenuation ponds (average area 110m²) will be constructed on site. The 6 no. permanent ponds located in the northwest of the substation and to the east of the compound will be constructed in series separated only by checkdams. These ponds will treat surface water runoff from the construction area of the compound and be retained to serve the same function in the operational phase. Two of the permitted ponds will be used temporarily to treat runoff from material stockpiled on the site until the berms ultimately re-vegetate.</p>		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM8	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	In relation to the proposed Coolnabacky 400/110kV Substation, the control of site runoff will be critical to minimising the potential for impact from this site. In particular the site drainage works and settlement ponds proposed will be developed in the first phase of construction activity and all surface water will be directed to the settlement ponds.		
MM9	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.1 Surface Water Protection	Drainage and runoff controls will be installed prior to starting site clearance and earthworks.		
MM10	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.1 Surface Water Protection	Settlement ponds will be provided adjacent to the areas of the site where the most excavation or earthworks are planned and would be sized to provide an adequate treatment volume for the first flush from the developed station. The stone check dams which divide the pond into primary, secondary and final settlement compartments will further reduce turbulence which will aid settlement and provide filtering of water.		
MM11	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.1 Surface Water Protection	Ongoing water monitoring at the discharge points and the receiving waters will be a key indicator of the effectiveness of the erosion and settlement control measures and the requirement for corrective action or the deployment of additional measures as outlined above. Methods, frequency and parameters to be monitored will be discussed and agreement sought with Inland Fisheries Ireland and National Parks and Wildlife Service prior to construction commencing.		
Construction Phase					
MM12	EIS - Chapter 2 Introduction	2.6 Construction Methodology	Excavated material will be stockpiled and stored in the berm areas indicated on the site layout plans. The berms volume will be approximately 11,000m ³ over a plan area of 5,000m ² .		
MM13	EIS - Chapter 2 Introduction	2.6 Construction Methodology	Initially the topsoil material will be stripped from the compound area and stored within the dedicated berm areas of the site.		
MM14	EIS - Chapter 5 Human Beings & Pop	5.5 Mitigation	During construction, the contractor will ensure that any works which could involve the transport of large loads along the public roads will be managed to avoid any conflicts with festivals and events likely to attract large numbers of people to the region, such as the Electric Picnic festival.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM15	EIS - Chapter 8 Ecology	8.5.1 Unit 1	It is intended that excavated material will be used on site for landscaping or for re-instatement measures. Other wastes will be removed for disposal at an appropriate licensed waste disposal facility (see Section 11.3). Note that this mitigation measure applies to all units.		
MM16	EIS - Chapter 8 Ecology	8.5.1 Unit 1	In relation to potential impact on groundwater fed watercourses it is proposed that continuous monitoring will be employed where the contractor proposes any dewatering during the construction phase and proposals for dewatering and monitoring will be approved by the designers and ecologist for the project.		
MM17	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<u>Mitigation by reduction</u> - Impacts will be minimised by limiting the extent of the works to the development footprint.		
MM18	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<u>Mitigation by reduction</u> - Potential impacts caused by spillages etc. during the operational phase will be reduced by keeping spill kits and other appropriate equipment on-site.		
MM19	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<u>Specific mitigation relating to birds, bats and mammals</u> Construction: any vegetation clearance that may be required to facilitate construction should be restricted, as much as possible, to time periods outside the bird and bat breeding season (March to September).		
MM20	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<u>Surface water Protection</u> Drainage and runoff controls will be installed prior to starting site clearance and earthworks.		
MM21	EIS - Chapter 8 Ecology	8.5.1 Unit 1	- Erosion control (preventing runoff) is much more effective than sediment control in preventing water pollution. Erosion control is less subject to failure from high rainfall and requires less maintenance. - Erosion control measures to prevent runoff flowing across exposed or excavated ground and becoming polluted with sediments are provided for in the design. This is primarily the use of existing site drains to channel runoff from up slope portions of a catchment around any construction areas or areas disturbed as a result of construction works. - Other inherent erosion control measures in the design include the design of roadways with minimum falls which do not exceed 15%.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM22	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<p>Additional erosion control measures will be provided for in the construction management proposals. These measures will include the following:</p> <ul style="list-style-type: none"> • Minimise the area of exposed ground. Backfilling and construction will occur in conjunction with excavation and excavation will not proceed faster than the rate of construction. Re-vegetating of disturbed area to take place as soon as possible. • Monitoring of the weather forecast prior to planning excavation works. • Providing impermeable mats (plastic sheeting) as covers to mounded excavated material and open excavations during periods of heavy rainfall. <p>Silt fences to be provided at the toe of any significant areas where excavated material is stored.</p>		
MM23	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<ul style="list-style-type: none"> - The Settlement Ponds are an integral part of the sediment control and containment measures on site and the protection of watercourses. Settlement ponds will be provided adjacent to the areas of the site where the most excavation or earthworks are planned. - The settlement ponds on the site have been sized to provide an adequate treatment volume for the first flush from the developed station and the ponds will ultimately have an attenuation volume so that surface water runoff can be limited to Greenfield runoff rates. This attenuation volume can be utilised as additional treatment volume in the construction phase when sediment generation is greatest. - The stone check dams which divide the pond into primary, secondary and final settlement compartments will further reduce turbulence which will aid settlement and provide filtering of water. - Surface water from the site will be discharged to existing vegetated drainage ditches within the site where further settlement of solids and filtering of surface water will occur prior to ultimate discharge to the adjacent watercourse. 		
MM24	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<p>The best way to manage pollution incidents is to prevent them. The contractor will identify and quantify risks associated with erosion and sediment for each work practice. Risks such as an unplanned bank collapse, mud slide and unforeseen rainfall event can be constantly assessed through geotechnical risk management and monitoring of weather forecasts.</p>		
MM25	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<p>The contractor will prepare an emergency response plan and set of procedures for events likely to cause pollution including the pollution of watercourses with silt or sediment. There will be a contingency plan in place during construction which will be displayed at appropriate locations.</p>		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM26	EIS - Chapter 8 Ecology	8.5.1 Unit 1	<p>Equipment required in responding to an emergency event with the capability of generating additional erosion and sediment laden runoff will be stored on site. Staff will be trained in the use and application of these temporary emergency measures which may involve the following:</p> <ul style="list-style-type: none"> • Impermeable matting (plastic sheeting); • Silt fences (posts & geotextile material); • Mulching capability (organic materials, straw, wood chip, bark or other wood fibres and gravel) to stabilise or protect cleared areas; • Settlement Tanks (portable propriety settlement tanks that can be transported to required areas). <p>Staff will be trained and made aware of procedures for notification of emergency events with the potential for pollution of watercourses.</p>		
MM27	EIS - Chapter 8 Ecology	8.5.1 Unit 1	- The contractor will store all chemicals, hydrocarbon based fuels and oil filled equipment when not in use in bunded areas of the site.		
MM28	EIS - Chapter 8 Ecology	8.5.1 Unit 1	- The contractor will have emergency spill kits comprising oil absorbent materials on site and staff trained in the use of these. Emergency response measures to oil/ fuel leaks will be displayed prominently on the site.		
MM29	EIS - Chapter 8 Ecology	8.5.1 Unit 1	- Sustainable Drainage Systems (SuDS) in the drainage network design will be put in place early in the construction phase to filter and biodegrade hydrocarbons in the unlikely event that any enter the water on the site.		
MM30	EIS - Chapter 8 Ecology	8.5.1 Unit 1	- There will be no large scale batching of concrete on the site. All concrete will come from a licensed supplier with environmental certification. No washing out of concrete supply trucks will be allowed on the site. No cementitious material will be allowed enter the water or groundwater on the site. Monitoring and emergency response measures for any escape of cementitious material will be put in place by the contractor.		
MM31	EIS - Chapter 8 Ecology	8.5.1 Unit 1	- Any foul waste generated in the construction and operational phase of the project will be collected and disposed off site by a licensed contractor. No contamination of groundwater will occur from foul waste.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM32	EIS - Chapter 9 Soils & Geology	9.5 Mitigation	<p>A project-specific Construction and Environmental Management Plan (CEMP) will be established and maintained by the contractors during the construction and operational phases. The CEMP will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures. In consideration of soils and geology the Plan will, as a minimum, consider the following sources:</p> <ul style="list-style-type: none"> • Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA)19 • Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 200520 • CIRIA Control of water pollution from linear construction projects. Technical guidance (C648), 200621 		
MM33	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	<p>During the construction phase the mitigation measures on soil and geology are associated with the following:</p> <ul style="list-style-type: none"> • Degradation of soils and/or subsoils • Excavation of soils and/or subsoils • Contamination of soils and/or subsoils • Management of excavated materials at off-site locations • Waste Management • Proximity to Site of Geological Interest 		
MM34	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	<p>Planned construction works will be carried out in such a manner as to ensure the least feasible disturbance of soils. It is envisaged that all topsoil will be retained on site where possible and reused as fill material (if suitable). An additional 3,500m³ of soil will be imported from the Ballyragget substation site (Unit 4) to supplement the berms.</p>		
MM35	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	<p>Contractors will be required to submit and adhere to a method statement indicating the extent of areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works. Where soil stripping occurs the resulting excavated soil fractions will be separated into topsoil/fill and subsoil stockpiles.</p>		
MM36	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	<p>Compaction of areas will be avoided where possible. Where compaction has occurred due to truck movements and other construction activities, restoration will be undertaken with areas reinstated to their original condition, where possible.</p>		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM37	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	Temporary storage of spoil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any ditches or surface water drains.		
MM38	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	In order to minimise potential degradation of in situ soil as a result of construction activities, the following measures will be implemented during the construction phase of the proposed line route: <ul style="list-style-type: none"> • In so far as practicable, compaction of any soil or subsoil which remains in situ along the proposed line route will be avoided • Stockpiles of soil/subsoil will be restricted to less than 3m in height • Repeated handling of soil will be avoided and ideally all soil stockpiles will remain undisturbed pending later re-use and re-establishment along the proposed line route • Construction traffic within the site will be required to follow dedicated routes 		
MM39	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	In order to reduce potential erosion of in situ and excavated soils/subsoil and minimise sediment discharge during the construction phase, the following measures will be implemented: <ul style="list-style-type: none"> • Leaving soil and/or subsoil undisturbed in situ for as long as possible prior to excavation • Minimising excavation and stockpiling activities during wet weather periods • Shaping stockpiles of excavated soil and/or subsoil so as to shed water • Construction of silt traps at an early stage in the construction programme • Interception and channelling of surface water runoff over exposed soil/subsoil surfaces to sumps, silt traps or settlement ponds where practicable, prior to discharge to existing drains or outfalls • Interception and diversion of surface water runoff away from open excavations where practicable 		
MM40	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within specially constructed dedicated temporary bunded areas. Oil and fuel storage tanks will be stored within designated areas with an impervious base. These areas will be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Filling and draw-off points will be located entirely within the bunded area(s). Drainage from the bunded area(s) will be diverted for collection and safe disposal.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM41	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	<p>In order to reduce the risk of contamination arising as a result of spills or leakages mitigation measures will include, but will not be limited to, the following:</p> <ul style="list-style-type: none"> • Storing fuels, chemicals, liquid and solid waste on impermeable surfaces • Undertaking refuelling of plant, equipment and vehicles on impermeable surfaces • Ensuring all tanks and drums are bunded in accordance with established best practice guidelines • Provision of spill kits and hydrocarbon absorbent packs in all construction vehicles. 		
MM42	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	<p>No concrete batching facility will be required at the site. All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include the following measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.</p> <ul style="list-style-type: none"> • The contractor will be required to make provision for removal of any concrete wash waters, most likely by means of tankering off-site. • Only the chute of the concrete delivery truck will be cleaned on site, using the smallest volume of water necessary. • Concrete trucks will be directed back to their batching plant for washout. • The arrangements for concrete deliveries to the site will be discussed with suppliers before commencement of work, agreeing routes, prohibiting onsite washout and discussing emergency procedures. • Clearly visible signs will be placed in prominent locations close to concrete pour areas, stating that washout of concrete Lorries are not permitted on the site. • Wash down water from exposed aggregate surfaces and cast-in-place concrete, and from washing of delivery truck chutes will be trapped on site to allow sediment to settle out and reach neutral pH before clarified water is released to a stream or drain system or allowed to percolate into the ground. 		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM43	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	Re-fuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles/ equipment will take place in designated bunded areas, where possible, and not on-site. If it is not possible to bring machinery to the refuelling point, fuel will be delivered in a double-skinned mobile fuel bowser. Any refuelling on site will take place at a designated distance away from watercourses (>10m) in accordance with the buffer zone guidelines highlighted in Section 10 Water (Interaction). A drip tray will be used beneath the fill point during refuelling operations in order to contain any spillages that may occur. Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment.		
MM44	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	All associated hazardous waste residuals will also be appropriately stored within temporary bunded storage areas prior to removal by a licensed waste management contractor for off-site treatment/recycling/disposal.		
MM45	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	If it is not feasible to immediately incorporate excess soil/subsoil into the permanent works, the appointed contractor will be required to dispose of, re-use the material off-site or store any excess earthworks materials at an appropriately permitted or licensed waste management facility, in accordance with the requirements of the Waste Management Act of 1996 (as amended) and associated Regulations. This restriction will ensure that potential indirect impacts on soil and geology at off-site locations will be subject to adequate environmental control and monitoring.		
MM46	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	Where practicable, excess earthworks materials will be temporarily stored at appropriately permitted or licensed waste management facilities, pending processing or re-use on future public works and/or private development projects.		
MM47	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	Implementation of these mitigation measures during the construction phase will ensure that excavated materials generated by site construction activities will be directed, where necessary, to waste recovery or disposal facilities, where the existing baseline rating of soil and/or subsoil is typically low or very low and the level of protection provided to the environment is appropriate to the risks involved.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM48	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	In the event of soils being taken off site they will be removed and disposed of by contractors licensed under the Waste Management Act of 1996 (as amended), the Waste Management (Facility Permit & Registration) Regulations of 2007 (as amended) and the Waste Management (Collection Permit) Regulations of 2007 (as amended). The issuing of such a permit to contractors allows them to use such material for landscaping and land reclamation, subject to conditions defined in the permit if the material has been classified as suitable for this use. Otherwise, the material will be classified for disposal at a suitably licensed landfill and removed off-site by a licensed waste contractor. In terms of surplus soil, any residuals will be stored within appropriate storage areas of sufficient capacity prior to removal by a suitably licensed waste management contractor for off-site treatment/recycling/disposal.		
MM49	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	A construction and demolition waste management plan will be developed by the appointed contractor in accordance with the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG, 2006) to ensure that all construction waste is stored, managed, moved, reused or disposed of in an appropriate manner by appropriate contractors in accordance with all relevant waste legislation. See Section 11.3 Waste (Interaction) for more detailed information.		
MM50	EIS - Chapter 9 Soils & Geology	9.5.1 Unit 1 Construction Phase	The GSI have stated that the only direct impact on any CGS would be from locating substations, structures or similar, at those locations ¹⁷ . The construction activities associated with the substation will not take place within the outline of the Timahoe Esker extents as issued by the GSI. ¹⁷		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM51	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	It is proposed to provide a clean water cut off drain to stop water running across construction areas and to discharge this to an adjacent stream. Drainage channels will collect runoff from the construction and development areas. These drainage channels will discharge to 2 no. dedicated Settlement Ponds constructed on site. 2 no. settlement ponds will be constructed at the site. Pond 1, located to the North of the substation will have a capacity to treat approx. the first 20mm of rainfall on the 400kV substation building and the stone area of the site. Pond 2 will have capacity to treat the first 33mm of rainfall generated from the transformers bund and the 110kV Substation building. These will be installed before site clearance and earthworks. The settlement ponds will be comprised of a system of check dams which will further divide the ponds into primary, secondary and tertiary pond. The settlement ponds will be lined with geotextile material on a bed of 200mm of single size clean stone. The settlement ponds will have a permanent water depth of 300mm and a combined treatment volume of 180m ³ . The pond will provide suitable attenuation for the 100 year rainfall return period. The permanent water depth and treatment volume can be increased during the construction phase when silt generation is at its highest. Temporary drainage from the site berms will be provided via French Drains until the berms are vegetated. The berms will be surrounded by silt fences until vegetated.		
MM52	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	<p>During the construction phase the mitigation measures have been applied for the following potential impacts:</p> <ul style="list-style-type: none"> • Increased Runoff and Sediment Loading • Contamination of local water courses and groundwater • Dewatering • Flood Risk • Localised alteration of groundwater flow, rate and direction <p>The mitigation measures will ensure that no sediment contamination, contaminated runoff or untreated wastewater will enter any watercourses during the construction of the proposed substation.</p>		
MM53	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	During the construction phase any drains carrying a high sediment load will be diverted through the settlement ponds. The settlement ponds will be located between the area of construction and the nearest field drain. Surface water runoff will not be discharged directly to local watercourses.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM54	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	<p>The following mitigation measures will be adopted:</p> <ul style="list-style-type: none"> • A drainage plan has been drawn up and submitted. The drainage system and settlement ponds will be constructed as a first step before major site clearance activities occur. • Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise potential for groundwater ingress into excavations. • Silt traps, such as geotextile membrane, will be placed in the existing drainage network around the substation site and along the proposed access road prior to the establishment of the settlement ponds and access road construction to minimise silt loss. These should be inspected and cleaned regularly. • Swales will be located along the access road. • Weather conditions will be taken into account when planning construction activities to minimise risk of run off from the site. 		
MM55	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	<p>To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents, paints and fuels used during construction will be stored within temporary bunded areas and each of these areas will be bunded to a volume of 110% of the capacity of the largest tank/container within it (plus an allowance of 30 mm for rainwater ingress). Filling and draw-off points will be located entirely within the bunded area(s). Drainage from the bunded area(s) will be diverted for collection and safe disposal.</p>		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM56	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	<p>No concrete batching facility will be required at the site. All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include the following measures to prevent discharge of alkaline wastewaters or contaminated storm water to groundwater:</p> <ul style="list-style-type: none"> • The contractor will be required to make provision for removal of any concrete wash waters, most likely by means of tankering off-site. • Only the chute of the concrete delivery truck will be cleaned on site, using the smallest volume of water necessary. • Concrete trucks will be directed back to their batching plant for washout. • The arrangements for concrete deliveries to the site will be discussed with suppliers before commencement of work, agreeing routes, prohibiting onsite washout and discussing emergency procedures. • Clearly visible signs will be placed in prominent locations close to concrete pour areas, stating that washout of concrete Lorries are not permitted on the site. • Wash down water from exposed aggregate surfaces and cast-in-place concrete, and from washing of delivery truck chutes will be trapped on site to allow sediment to settle out and reach neutral pH before clarified water is released to a stream or drain system or allowed to percolate into the ground. 		
MM57	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	Any effluent generated by temporary onsite sanitary facilities will be taken off-site for appropriate treatment.		
MM58	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	To minimise the vulnerability of groundwater during the removal of the soil and/or subsoil during construction of the proposed substation, all ground works will be completed in an appropriately managed manner. A procedure for managing this activity will be included as part of the Construction & Demolition Waste Management Plan, for the proposed substation. See Section 11.3 Material Assets – Waste (Interaction).		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required												
MM59	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	<p>Some construction works on site may take place in the vicinity of watercourses in the riparian zone. The riparian zone is the land immediately adjoining the aquatic zone and influenced by it. A buffer area will be established to protect the riparian and aquatic zones from disturbance. The buffer area generally extends beyond the riparian zone. The width of a buffer area will be determined by the guidance set out by the Department of the Marine and Natural Resources ³⁰, which are shown in Table 10.18:</p> <table border="1"> <thead> <tr> <th>Average slope leading to aquatic zone</th> <th>Buffer zone width on each side of the aquatic zone</th> <th>Buffer zone width for highly erodable soils</th> </tr> </thead> <tbody> <tr> <td>Moderate (even to 1 in 7 / 0-15%)</td> <td>10 m</td> <td>15 m</td> </tr> <tr> <td>Steep (1 in 7 to 1 in 3 / 15-30%)</td> <td>15 m</td> <td>20 m</td> </tr> <tr> <td>Very steep (1 in 3 / >30%)</td> <td>20 m</td> <td>25 m</td> </tr> </tbody> </table> <p>Table 10.18 Buffer Zone Guidelines</p>	Average slope leading to aquatic zone	Buffer zone width on each side of the aquatic zone	Buffer zone width for highly erodable soils	Moderate (even to 1 in 7 / 0-15%)	10 m	15 m	Steep (1 in 7 to 1 in 3 / 15-30%)	15 m	20 m	Very steep (1 in 3 / >30%)	20 m	25 m		
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MM60	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	Re-fuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles/ equipment will take place in designated bunded areas where possible. Re-fuelling will be avoided in so far as possible at the other work sites but where necessary will take place within appropriately bunded areas at a designated distance away from watercourses (>10m). This is in accordance with the buffer zone guidelines in Table 10.18.														
MM61	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	If it is not possible to bring a machine to the refuelling point, fuel will be delivered in a double-skinned mobile fuel bowser. A drip tray will be used beneath the fill point during refuelling operations in order to contain any spillages that may occur. The vehicles and equipment will not be left unattended during refuelling. Spill kits and hydrocarbon absorbent packs will be stored in the cab of each vehicle and operators will be fully trained in the use of this equipment.														
MM62	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	The generation of runoff from stockpiles of soils, excavated during construction, will be prevented from entering watercourses by diverting runoff to the settlement ponds on site, and removing the material offsite as soon as possible to designated storage areas.														
MM63	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	It is recommended that a 25m buffer zone is applied around the tufa deposits to ensure protection of the deposits. No works during construction and operation will occur within this area, including re-fuelling, batching of concrete or storage of fuels and soil stockpiles. See Appendix 6.														

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM64	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	Guidelines stated at the beginning of this section will be adhered to, thus ensuring that the impact on the water environment during the construction phase of the proposed substation is minimised. In particular, the ESB CEMP, which sets out methods for minimising the environmental risks associated with construction works, will be referred to in the planning of any construction works in the vicinity of watercourses.		
MM65	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	In order to ensure that on-going works are being carried out in accordance with the CEMP, water monitoring will be undertaken our during the construction phase. Sampling points will be located at the following designated locations: <ul style="list-style-type: none"> • Upstream of the construction site discharge points (surface water) • Outlet from the proposed settlement ponds (surface water) • Downstream of the construction site discharge points (surface water) • Up gradient of the construction site (BH1 – ground water) • Down gradient of the construction site (BH4 – ground water) 		
MM66	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	The Site Investigations ^{13,18} indicates that the sand and gravel deposits are not saturated and groundwater flow into the excavation during construction is expected to be limited. However, should ongoing dewatering be required during excavations it is recommended that a low-permeability barrier be installed around the excavation walls. This will ensure that any potential for drawdown that could affect the water environment is minimised.		
MM67	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	Measures to prevent localised flooding will be implemented by proper design of the construction works and maintenance of existing drainage within the proposed substation. The surface water drainage system proposed ensures that there is no increase in surface water runoff from the proposed substation, as Greenfield run-off rates will be maintained during operation. See the Drainage and Infrastructure Report (ESBI Report Ref: PE687-F0261-R261-016) for details.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM68	EIS - Chapter 10 Water (Hydrology and Hydrogeology)	10.5.1 Unit 1 Construction Phase	<p>The construction of the proposed substation will temporarily change the groundwater regime should excavations extend below the water table and should pumping be required to enable the pouring of concrete. The following mitigation measures will be adopted:</p> <ul style="list-style-type: none"> • Time for excavations being open will be minimised as far as possible. • Lowering of groundwater table, if required, will be mitigated by avoiding unnecessary pumping and dewatering of excavations. Where possible, groundwater exclusion techniques will be used such as drainage or sheet piling which will reduce the need for dewatering and will avoid unnecessary drawdown of the water table outside of the excavations. • Locally excavated material will be reinstated surrounding the foundation base immediately following construction to allow recovery of any potential groundwater level change as quickly as possible. • Aggregate will be imported rather than quarried on site 		
MM69	EIS - Chapter 11 Material Assets	11.2.6 Traffic Mitigation	ESB will liaise with both Laois County Council and Kilkenny County Council in regard to traffic management during construction and adhere to all their requirements.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM70	EIS - Chapter 11 Material Assets	11.2.6 Traffic Mitigation	<p>A Traffic Management Plan will be prepared and included as part of the CEMP. It will include, but not limited to the following specific mitigation measures:</p> <ul style="list-style-type: none"> • Construction and delivery vehicles will be instructed to use only the approved and agreed means of access and movement of construction vehicles will be restricted to these designated routes. • Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material. • Warning signs will be installed at appropriate locations. • Temporary traffic lights and/or road or lane closures will be provided as required to ensure traffic safety. • Parking of site vehicles on the public roads will not be permitted. • Wheel washing facilities including judder bars will be utilised within site prior to joining the stone surfaced access roadway, to remove any spoil or other deposits prior to leaving the substation work sites. • A road sweeper will be employed at the substation work sites to clean the public roads of any residual spoil debris that may be deposited on the public roads leading away from each site. • All vehicles will be properly serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. All scheduled maintenance will be carried out off site. • The appropriate authorities will be notified of the movement of abnormal loads and traffic management measure agreed in advance such as: <ul style="list-style-type: none"> o Placing warning notices to advise other road users of the presence of slow moving vehicles o Using lead warning vehicles and using Garda escorts where required o Undertaking deliveries at times that minimise the impact on other road users and resting in safe lay-bys to reduce any traffic congestion. o Closing up of extendable transport vehicles on return journeys. 		
MM71	EIS - Chapter 11 Material Assets	11.2.6 Traffic Mitigation	<p>During construction, liaison will be maintained with the residents along the line routes and in the vicinity of the stations. They will be advised of any particularly busy periods and, where practical, their suggestions and comments will be taken on board.</p>		
MM72	EIS - Chapter 11 Material Assets	11.2.6 Traffic Mitigation	<p>A condition assessment of county and regional roads which are to be used for construction traffic haul routes will be undertaken prior to commencement, with regular inspections during the works period. In the event of damage to the road pavement or remedial work to reinstate the road will be carried out at the developer's expense.</p>		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM73	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	Waste management will be carried out in accordance with “Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects” produced by the Department of Environment, Community and Local Government. Regulations in relation to waste management will be adhered to. Disposal of construction waste will be to licensed disposal facilities. On-site segregation of waste will be provided by the contractor using skips for timber, steel, general waste, and recyclables.		
MM74	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	A Construction Waste Management Plan will be prepared and implemented by the contractor to minimise waste generation. The key principles underlying the plan will be to minimise waste generation and to segregate waste at source.		
MM75	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	Approximately 12,000 m ³ (24,000 tonnes) of excavated material will be re-used as landscaping material at Coolnabacky. A Certificate of Registration will be sought from the Local Authority for the reuse of excavated soil at Coolnabacky.		
MM76	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	Other waste generated will be removed off site by licensed contractors for appropriate treatment/disposal or recycling at licensed facilities.		
MM77	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	Facilities for segregation of waste will be made available to optimise reuse and recycling of construction waste and correct disposal of domestic waste.		
MM78	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	Soil material will be tested regularly by a competent company prior to removal to ensure material is inert.		
MM79	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	Where applicable, temporary site sanitary facilities will be connected to a holding tank which will be pumped out as required and disposed of in an appropriate manner to a licensed disposal facility.		
MM80	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	Fuels or chemicals stored on site will be stored in an enclosed, bunded unit and located a safe distance from mobile generators or electrical equipment.		
MM81	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	Spill kit bags/bins will be made available at sites and in relevant vehicles should a spill occur.		
MM82	EIS - Chapter 11 Material Assets	11.3.3 Waste Mitigation Measures	Portable bunds will be used when refuelling to avoid fuel spills.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM83	EIS - Chapter 11 Material Assets	11.4.1 Gas Mitigation Measures	A pre-construction audit will be undertaken to confirm the preliminary conclusions as to the presence or absence of gas infrastructure in the construction area.		
MM84	EIS - Chapter 11 Material Assets	11.4.2 Television and Communication Signals Mitigation Measures	A site specific risk assessment will be carried out where any telecom services are present. Consultation will take place with service provider prior to any construction works in the proximity of existing telecom services likely to be impacted, as required.		
MM85	EIS - Chapter 11 Material Assets	11.4.2 Television and Communication Signals Mitigation Measures	In the unlikely event of interference arising to communication networks, adjustments to the orientation of the aerial of the radio or television/internet connection will be rectified.		
MM86	EIS - Chapter 11 Material Assets	11.4.3 Water Supply	Water will be imported by tanker for construction works at Coolnabacky substation. It is proposed to meet the long term water demand for the substation from the local groundwater resource through a bored well. The expected demand will be less than that of a domestic supply as it will be used for sanitary services and canteen purposes. The substation will be unmanned and the water demand will be intermittent.		
MM87	EIS - Chapter 11 Material Assets	11.4.4 Wastewater Treatment Mitigation Measures	All sewage at Coolnabacky will be collected via a holding tank and disposed of by licensed waste contractor.		
MM88	EIS - Chapter 11 Material Assets	11.5.3 Air Navigation Mitigation Measures	The proposed substation at Coolnabacky (Unit 1) and permitted overhead lines (Unit 2, 3, 5 and 8) will not have an impact on safety of aviation activities at the Midlands Heliport/Midlands Microlight centre site as referenced in correspondence from the Irish Aviation Authority on 16th April 2012.		
MM89	EIS - Chapter 11 Material Assets	11.6.5 Agricultural Impact Assessment Mitigation	Protocols are in place for taking precautions in identification of any current disease issues (e.g. TB) on farm and awareness of implications.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
		Measures			
MM90	EIS - Chapter 11 Material Assets	11.6.5 Agricultural Impact Assessment Mitigation Measures	Consideration to be given to minimise disruption to all farming activity.		
MM91	EIS - Chapter 12 Air and Climate	12.5 Mitigation Measures Construction Phase	<p>Traffic-related effects, site excavation works and material storage are the principal potential sources of airborne dust and these can be managed through a comprehensive construction management plan for the sites, setting out the mitigation measures set out below and detailing how they will be enforced:</p> <ul style="list-style-type: none"> • Transport of materials to and from the sites will take place in normal working hours and along routes agreed with the local authority. • Vehicle speeds will be restricted on haul roads. • Vehicles will be routinely maintained to minimise emissions. • Site haul roads will be dampened down with water during prolonged dry periods if necessary. • Dusty materials such as excavated materials will be stored and handled appropriately (for example, by covering where necessary and minimising the drop heights of materials). • Wheel-wash facilities of vehicles leaving site will be provided. • Materials likely to be a source of dust will be transported in an appropriate manner (for example, by covering the load). • Suitable hoardings will be used at the construction site to prevent dispersal of materials by wind. • Site management practices will incorporate appropriate dust monitoring. • All construction will be completed in a timely fashion. • Bare areas will be re-vegetated on contractor's completion. • Maintain plant and equipment to minimise fuel consumption. 		
MM92	EIS - Chapter 12 Air and Climate	12.5 Mitigation Measures Construction Phase	Any impacts of construction on air quality will be of short duration and will be rendered negligible by implementation of these mitigation measures through the construction management plan.		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM93	EIS - Chapter 12 Air and Climate	12. 7.5 Mitigation Measures Construction Phase Substations	Noise during the construction stage will be limited by the scale of the project. The noise levels will be maintained within the limits set in National Roads Authority guidelines (the only 'official' construction noise guideline in Ireland). The construction stage contract will include provision for independent noise monitoring to ensure that noise limits are being adhered to.		
MM94	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.1 Surface Water Protection	Erosion control measures to prevent runoff flowing across exposed or excavated ground and becoming polluted with sediments are provided for in the design. Other inherent erosion control measures with minimum falls which do not exceed 15%. Additional erosion control measures include: <ul style="list-style-type: none"> • Minimise the area of exposed ground. • Monitoring of the weather forecast prior to planning excavation works. • Providing impermeable mats as covers to mounded excavated material and open excavations during periods of heavy rainfall. Silt fences to be provided at the toe of any significant areas where excavated material is stored.		
MM95	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.1 Surface Water Protection	The contractor will identify and quantify risks associated with erosion and sediment for each work practice. Risks such as an unplanned bank collapse, mud slide and unforeseen rainfall event can be constantly assessed through geotechnical risk management and monitoring of weather forecasts.		
MM96	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.1 Surface Water Protection	The emergency response plan and procedures for events likely to cause pollution will be prepared by contractors, and would be displayed at appropriate locations.		
MM97	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.1 Surface Water Protection	Equipment with the capability of generating additional erosion and sediment laden runoff will be stored on site. Staff will be made aware of procedures for notification of emergency events with the potential for watercourses pollution and trained in the use and application of the emergency equipment, which may involved: <ul style="list-style-type: none"> • Impermeable matting (plastic sheeting); • Silt fences (posts & geotextile material); • Mulching capability (organic materials, straw, wood chip, bark or other wood fibres and gravel) to stabilise or protect cleared areas; • Settlement Tanks (portable propriety settlement tanks that can be transported to required areas). 		

Ref No.	Reference Heading	Sub-Chapter	Mitigation Measures	Audit Results	Action Required
MM98	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.2 Water Table and Groundwater Protection	Deep excavations below the water table encountered in the Site Investigation will be kept to a minimum level. The project does not expect any excavation that may cause a material difference in the local groundwater table level. Continuous monitoring will be employed where the dewatering is required, and the proposals will be approved by the designers and ecologist. Therefore, there would be no expected impact on the spring fed watercourses in the area.		
MM99	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.2 Water Table and Groundwater Protection	The contractor will store all chemicals, hydrocarbon based fuels and oil filled equipment when not in use in bunded areas of the site. The contractor will have emergency spill kits comprising oil absorbent materials on site and staff trained in the use of these. Emergency response measures to oil/ fuel leaks will be displayed prominently on the site.		
MM100	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.2 Water Table and Groundwater Protection	Sustainable Drainage Systems (SuDS) in the drainage network design will be put in place early in the construction phase to filter and biodegrade hydrocarbons in the unlikely event that any enter the water on the site.		
MM101	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.2 Water Table and Groundwater Protection	There will be no large scale batching of concrete on the site. All concrete will come from a licensed supplier with environmental certification. No washing out of concrete supply trucks will be allowed on the site. No cementitious material will be allowed enter the water or groundwater on the site. Monitoring and emergency response measures for any escape of cementitious material will be put in place by the contractor.		
MM102	NIS - Section 4.3.1 Coolnabacky substation site	4.3.1.2 Water Table and Groundwater Protection	Any foul waste generated in the construction and operational phase of the project will be collected and disposed off site by a licensed contractor. No contamination of groundwater will occur from foul waste.		
MM103	Post Planning Mitigation Petrifying Spring Survey and Assessment Coolnabacky, Co.Laois	Section 4 Recommendations	In addition to localised scrub clearance, annual mowing of the grassland in this area would prevent the re-development of long vegetation and scrub. This could be an annual cut of the grassland around mid-August, with the cuttings removed. This would also enhance species diversity in the grassland. Not all of the grassland needs to be cut each year and retaining some areas of long grass would provide refuge for overwintering insects and other fauna. Again, this should only be undertaken with input and supervision from the project ecologist. Once agreed, an ongoing maintenance plan can be created.		

7 MONITORING MEASURES

This section of the CEMP groups together all of the monitoring measures presented in the Environmental Impact Statement (EIS) and a Natura Impact Statement (NIS) prepared as part of the planning permission application to An Bord Pleanála. See locations of monitoring equipment figure 8 below.

Table 5 on the next page outlines the monitoring measures that will be undertaken on the project. This table can be further expanded during the course of the project, to provide a comprehensive report of site environmental compliance audits.

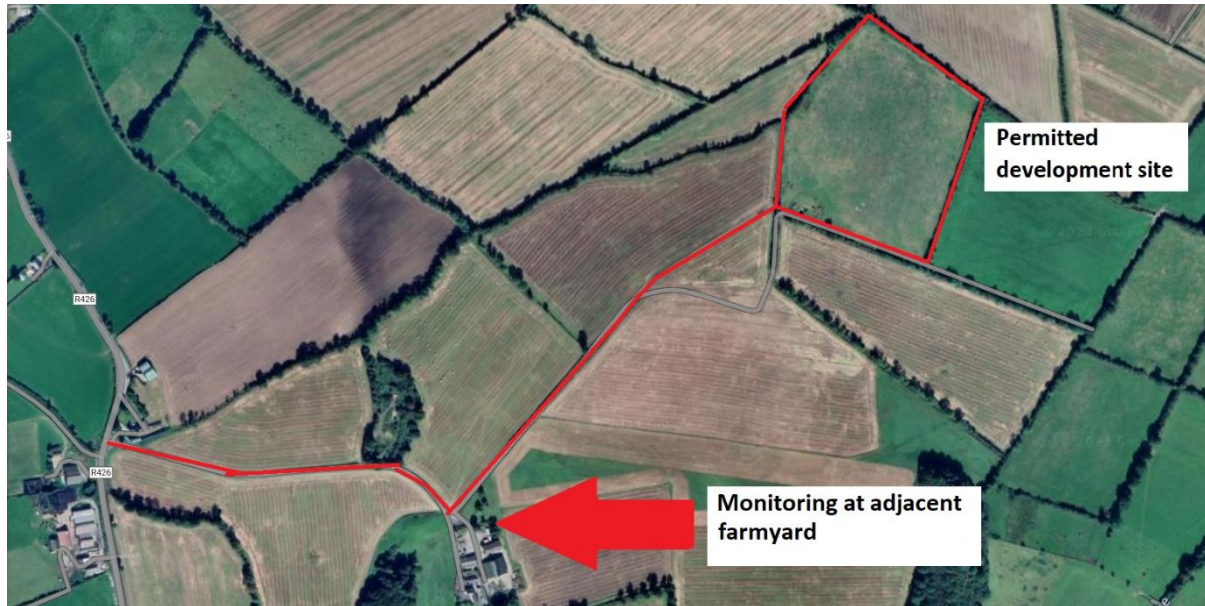


Figure 8 Monitoring Location of Noise, Dust and Vibration Equipment

SUPERVISED RECEPTORS	FREQUENCY	WHAT NEEDS TO BE MONITORED	LOCATION
NOISE	ONGOING BASIS Reported as part of the monthly environmental monitoring report	db (Decibels)	The adjacent farmyard
DUST	ONGOING BASIS Reported as part of the monthly environmental monitoring report	Air-suspended particles	The adjacent farmyard
WASTE	ONGOING BASIS Reported as part of the monthly environmental monitoring report	Supervise timber, metal, general waste, recyclables, canteen, compost and hazardous	Construction Site
SURFACE WATER	DAILY	Turbidity, discolouration, any breaches or maintenance issues	4 Sampling points: SW1, SW2, SW3, SW4 See Appendix 06 ESB Drainage, Drawing PE493-D108-053-002-009
	WEEKLY	In-situ measurement for pH, Dissolved oxygen, Turbidity, Temperature, Electrical conductivity	
	MONTHLY	Water sampling and analyses for pH Conductivity, Chloride, Sodium, Sulphates Calcium, Magnesium, Potassium, Ammoniacal NH ₄ , Nitrate, Alkalinity, Phosphorus, Total TPH	
	QUARTERLY	Water sampling and analyses for pH Conductivity, Chloride, Sodium, Sulphates Calcium, Magnesium, Potassium, Ammoniacal NH ₄ , Nitrate, Alkalinity, Phosphorus, Total TPH	
GROUNDWATER	WEEKLY	Groundwater level measurement	BH1, BH2, BH3, BH4 See Appendix 06 ESB Drainage, Drawing PE493-D108-053-002-009
	MONTHLY	Groundwater sampling and analysis for pH, Conductivity, Chloride, Sodium, Sulphates, Calcium, Magnesium, Potassium, Ammoniacal NH ₄ , Nitrate, Alkalinity, Phosphorus, Total TPH	
	QUARTERLY	Groundwater sampling and analysis for pH, Conductivity, Chloride, Sodium, Sulphates, Calcium, Magnesium, Potassium, Ammoniacal NH ₄ , Nitrate, Alkalinity, Phosphorus, Total TPH	
ARCHAEOLOGY	Daily - Works Dependent	On Site Monitoring by Appointed Archaeologist, Monitoring Required for all Topsoil Removal (500mm Depth)	Site Works Dependent - Where topsoil stripping occurs
ECOLOGY	Daily	Site personnel to monitor site for signs of resting or breeding places of any protected species be discovered within the site during construction works, ESB will be informed.	Site Environs
	Monthly	Ecological site walkovers will be conducted on a monthly basis and an inspection for invasive species will form part of this survey	Site Environs
ROADS	Precommencement	Preconstruction Road Condition Survey	Local Road Network - area between intersection of R426/Pike Rd in Timahoe village to the R426/R427 crossroads
	Daily	Checking road condition for any damage or project related degradation.	Local Road Network - area between intersection of R426/Pike Rd in Timahoe village to the R426/R427 crossroads
	Weekly	Checking road condition for any damage or project related degradation.	Local Road Network - area between intersection of R426/Pike Rd in Timahoe village to the R426/R427 crossroads
	Monthly	Checking road condition for any damage or project related degradation.	Local Road Network - area between intersection of R426/Pike Rd in Timahoe village to the R426/R427 crossroads
	Post Condition Survey	Postconstruction Road Condition Survey	Local Road Network - area between intersection of R426/Pike Rd in Timahoe village to the R426/R427 crossroads
VIBRATION	ONGOING BASIS Reported as part of the monthly environmental monitoring report	Peak Particle Velocity (ppv) mm/s	The adjacent farmyard

Table 5 Monitoring Measures

8 AUDITING MEASURES

This section of the CEMP provides details of the mechanisms for assessing the compliance of the construction phase of the development through a series of site audit and inspections against the mitigation set out in section 6: Mitigation Measures and Section 7: Monitoring Measures.

Environmental control measures are reviewed and monitored on site via audits, inspections, surface water visual inspections, water monitoring through sampling, noise and vibration monitoring, dust monitoring & waste management monitoring.

Site inspections shall be carried out daily by the Site Management team, to check that all works being carried out are in compliance with this CEMP. Daily site inspections shall also monitor all site environmental control measures, as discussed in Section 7 Monitoring Measures. Formal site audits will be carried out monthly by Environmental Management Personnel.

All inspections and audits will be recorded and stored on site.

Environmental non-conformances are defined as actions or outcomes that are not in compliance with environmental limits, standards, permits, licences or legislation. In the event that works are being carried out on site, that do not comply with the requirements of the CEMP, a Non-Conformance Report will be raised to the project Manager for their immediate attention.

Site management and SHEQ Department shall complete the environmental audits and inspections as outlined in table 5 below:

Audit & Inspection	Responsible	Frequency
Environmental Site Inspection	Site Management	Daily Checks
Waste Management Audit	SHEQ Department	Periodically
SHEQ Inspection	SHEQ Department	Weekly
Site Manager SHEQ Checklist	Site Management	Weekly
Environmental Site Inspection	Environmental Manager	Monthly

Table 6 Audit & Inspection Schedule

8.1 Site Inspections and Environmental Audits

Routine inspections of construction activities will be carried out on a daily and weekly basis by the Environmental Manager to ensure all controls are in place to prevent environmental impact.

Environmental inspections will ensure that the works are undertaken in compliance with the CEMP and all other planning application documents. Only suitably trained staff will undertake environmental site inspections. Baseline monitoring undertaken can be found in Appendix 13. The following is a list of monitoring that will be undertaken as part of monitoring measures being employed by the contractor outside of the site:

- Noise
- Dust
- Vibration
- Roads

The following is a list of monitoring that will be undertaken as part of monitoring measures being employed by the contractor on the site:

- Waste
- Surface Water
- Groundwater
- Archaeology
- Ecology

8.2 Auditing

Environmental audits will be carried out during the construction phase of the project. Environmental audits will be carried out by the Environmental Manager or a member of the Contractor's Management Team. Environmental audits will be conducted at planned intervals to determine whether the CEMP is being properly implemented and maintained. The results of environmental audits will be provided to the Project Developer and the Site Manager.

8.3 Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during construction:

- **Environmental Near Miss**
An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.
- **Environmental Incident**
Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the site boundary.
- **Environmental Exceedance Event**
An environmental exceedance event occurs when monitoring results indicate that limits for a particular environmental parameter (as indicated in the Environmental Monitoring Programme) has been exceeded.
- **Environmental Non-Compliance**
Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the CEMP.

An exceedance will immediately trigger an investigation into the reason for the exceedance occurring and the application of suitable mitigation where necessary.

Exceedance events can be closed out on achieving a monitoring result below the assigned limit for a particular environmental parameter.

8.4 Corrective Action Procedure

A corrective action is implemented to rectify an environmental problem on-site. Corrective actions will be implemented by the Construction Manager, as advised by the Environmental Manager. Corrective actions may be required as a result of the following;

- Environmental Audits.
- Environmental Inspections and Reviews.
- Environmental Monitoring.
- Environmental Incidents.
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention, there will be direct communications between the Construction Manager and the Environmental Manager. This in turn will be passed down to the site staff involved. A Corrective Action Notice will be completed at a later date.

8.5 Construction Phase Plan Review

The CEMP will be the subject of continuous review by the Environmental Manager on behalf of the Site Manager with revised versions of the CEMP is presented as required.