FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

CLAREMORRIS CLOSED LANDFILL REMEDIATION PROJECT

CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN (CEMP) FOR THE PROPOSED REMEDIATION OF CLAREMORRIS CLOSED LANDFILL

Prepared for: Mayo County Council

Comhairle Contae Mhaigh Eo
Mayo County Council

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CONSTRUCTION AND ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED REMEDIATION OF THE CLAREMORRIS CLOSED LANDFILL (CEMP)

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Abstract: This document comprises the Construction and Environmental Management Plan (CEMP) for the Remediation of the Closed Landfill at Clare, Claremorris, Co. Mayo, the purpose of which is to set out the key construction and environmental management issues associated with the proposed works. This plan will be developed further at the construction stage and on the appointment of the Contractor to the project.

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1. INTRODUCTION

This document is the Construction and Environmental Management Plan (CEMP) for the proposed Claremorris closed landfill remediation and has been prepared by Fehily Timoney and Company (FT) on behalf of Mayo County Council (MCC) on a preliminary basis to accompany an application to An Bord Pleanála under Section 177AE of the Planning and Development Act, 2000 (as amended).

This document comprehensively sets out the construction and environmental management concerns associated with the proposed works, to ensure that during construction, the environment is protected and impacts on the environment are minimised. This CEMP will be adopted by the contractor who will be responsible for the appropriate execution of the proposed works as set out in this document.

The EPA issued a Certificate of Authorisation (CoA) for the site on the 19th August 2021 (Licence number: H0319-01, See Appendix 1). The proposed project is to implement the requirements of CoA to remediate the closed landfill site.

1.1 General Introduction and Purpose

This CEMP sets out the key environmental management issues associated with the proposed remediation works, to ensure that during the construction and operation of the development, the impacts on the environment are minimised.

Condition 3 of the CoA requires MCC to implement remediation works to this closed landfill in order to ensure

> *"..discharges and emissions from the closed landfill do not cause environmental pollution or deterioration in the status of the receiving surface water body or groundwater body.".*

The CoA is issued under Regulation 7 (6) of the Waste Management (Certificate of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008.

The purpose of the proposed remediation works is to implement Condition 3 of the CoA.

1.2 The Client

Fehily Timoney & Company (FT) was commissioned by Mayo County Council to provide consultancy services in respect of the proposed Claremorris closed landfill remediation.

1.3 The Site

Claremorris closed landfill is located in the townland of Clare, Claremorris, Co. Mayo. The site is approximately 800m south-east of Claremorris town. The closed landfill capping area footprint is 3.8ha and is located within a larger application site consisting of open land which has an area of 5.6ha. The site is currently vacant and in an overgrown state. Neighbouring land uses include agricultural grassland, cutaway bogland, commercial forestry and residential properties located approximately 280m to the west of the site. An electrical substation is also located approximately 150m to the north of the site. The site is bound by the Dublin-Westport Railway line to the north, the Knock-Claremorris Bypass (N17) to the West, commercial forestry to the south and agricultural land (boggy ground) occupies the remaining land to the east of site.

The site operated as a landfill accepting municipal waste from 1982 to March 1996. The site was capped with boulder clay, but no remediation works have been completed.

Waste deposited at the site is understood to comprise of municipal and commercial wastes to depths of 6.5m below ground level (BGL). The interpreted landfill extent covers an area of 32,000 m^2 and initial calculations estimate an interred waste volume of approximately 168,000 – 297,623m^3 at the site.

The western portion of the site (raised area) is inhabited by rough grassland and scrub. The eastern half of the site forms part of an area of harvested, drained peatland.

The site generally falls from south to north towards the railway and west to east towards the harvested and drained peatland. The KILBEG-MALONE (EPA code: 30K3711), a 1st order stream crosses the eastern portion of the site travelling in a southern direction. After flowing for 44km, this stream ultimately enters Lough Mask via the LISDUFF 30 (EPA code: 30L4313) and Robe River (EPA code: 30R0115).

The site currently:

- Has a shallow soil cap with an established grass and shrub cover.
- Is drained by a watercourse along the western and northern boundary of the site which ultimately discharge to the Kilbeg-Malone River.
- Is secured by stock proof fencing along the western boundary of the site.

Invasive species identified on site include, Japanese Knotweed (*Fallopia japonica*), Winter Heliotrope (*Petasites fragrans*) and Cherry Laurel (*Prunus laurocerasus*). An Invasive Species Management and Treatment Plan has been developed to address the required works for invasive species in the site.

A Site Location Map drawing showing the site and its immediate environs is enclosed with this planning application (Drawing Reference: P21-287-0100-0001).

A GIS Figure showing the Site Location is shown in Figure 1-1.

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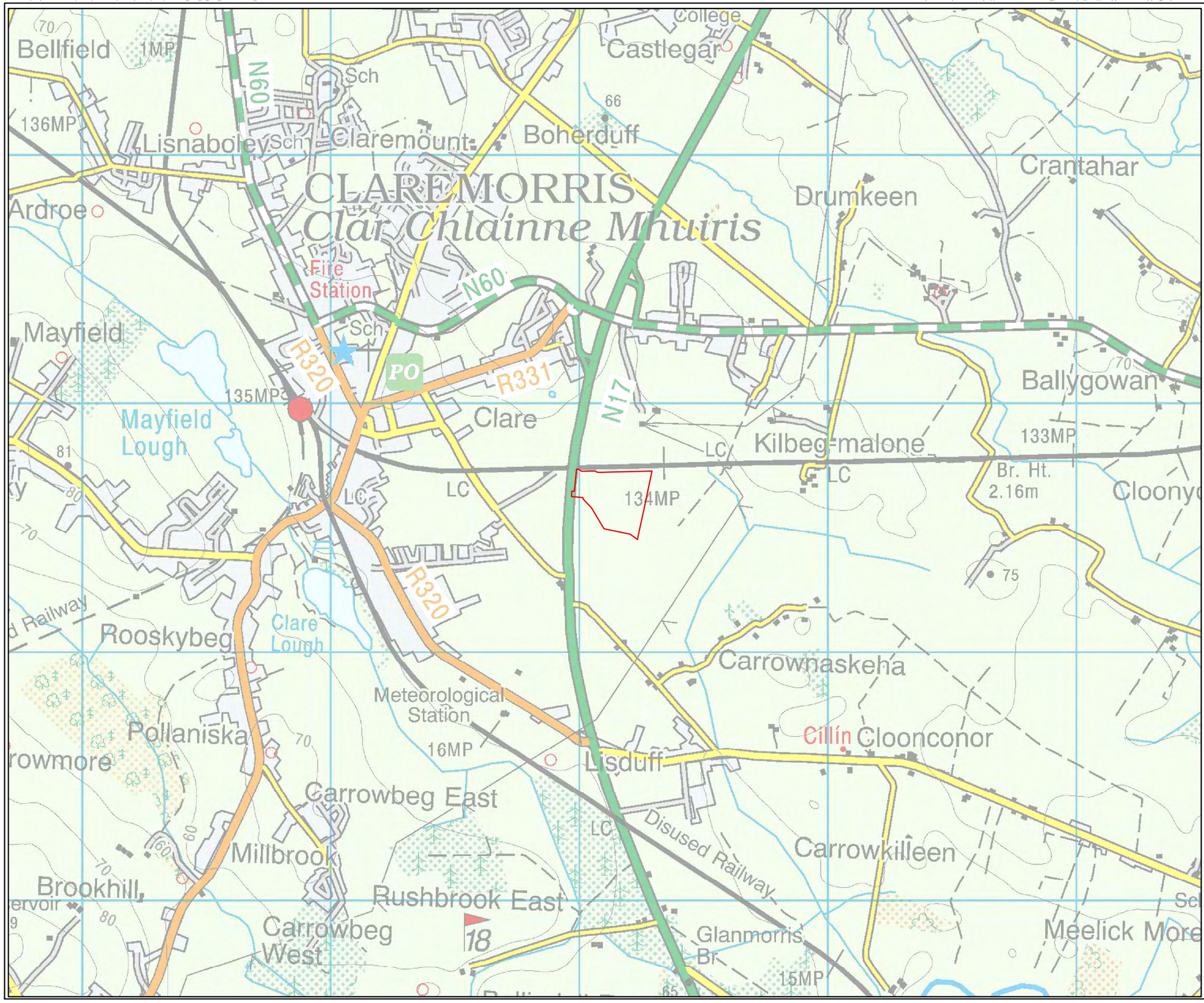

TITLE:	Site Location		
PROJECT:	Claremorris Historic Landfill		
FIGURE NO:	1.1		
CLIENT:	Mayo County Council		
SCALE:	1:15000	**REVISION:**	0
DATE:	06/05/2022	**PAGE SIZE:**	A3

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1.4 Overview Description of the Project

Mayo County Council proposes to seek the approval of An Bord Pleanála for the completion of Closed Landfill Remediation Works at a Closed Landfill site in Clare, Claremorris, County Mayo.

The application site, as defined by the red line boundary in the accompanying drawings, is 5.6ha in size. The extent of the waste body with the site is 3.2ha. The proposed capping area within the application site is 3.8ha in size.

The proposed development will consist of the following:

- The development of a site access road
- The development of a temporary site compound and office area.
- Site clearance, including the removal of an existing gate, existing timber post and wire fencing and clearance of existing vegetation
- Grading/profiling of the existing site area.
- Installation of an engineered landfill capping system covering an area of 3.8 hectares.
- The installation of stock proof fencing, and a new access gate on-site.
- Landscaping of the final formation of the capping area using a high value native grass cover.

The following will be carried out on-site following on from the completion of the proposed development works:

- Ongoing environmental monitoring.
- Oxidation of methane in landfill gas
- Maintenance of engineered cap on-site.
- Maintenance of surface water drainage system on-site.

2. EXISTING ENVIRONMENT

The closed landfill site is in the townland of Clare, approximately 800m south-east of Claremorris town, the site is situated in agricultural land. The site is bounded by a railway to the north and by the Knock-Claremorris Bypass (N17) to the West. The site operated as a landfill accepting municipal waste from 1982 to March 1996. The site was capped with boulder clay, but no remediation works have been completed. The site is accessed from the west via the Knock-Claremorris Bypass (N17). An aerial overview of the existing site is shown in Figure 2-1 below.

Aerial imagery (EPA web viewer; dated 2020) and findings from the site survey carried out indicates that the western portion of the site (raised area) is inhabited by rough grassland and scrub.

The eastern half of the site forms part of an area of harvested, drained peatland. The site generally falls from south to north towards the railway and west to east towards the harvested and drained peatland and KILBEGMALONE stream. Open drains run west to east on this section of the site and outside of site to the south, draining the land towards the KILBEG-MALONE[1] (EPA code: 30K37[2]) which travels south.

The quaternary Map provided by GSI Online identifies most quaternary sediments at the site as 'Cut over raised peat' and a north-west portion as 'Gravels derived from Limestones'; 'Till derived from limestones' is found in the surrounding area.

The soil underlying and surrounding the landfill mound is peat varying between 4-6m deep.

The GSI online 1:100,000 scale bedrock geology map, shows the entirety of the site and surrounding area are underlain by the Ballymore Limestone Formation. GSI mapping indicates the presence of karst aquifer located within the site. The site is located within the area of the groundwater body Cong-Robe[3] (Code: IE_WE_G_0019[4]).

According to the EPA map viewer, the site is located within the Corrib catchment[5] (hydrometric area 30[6]), sub catchment Robe_SC_010[7] (Code: 30_9[8]) and Sub-basin Robe_020[9]. The KILBEG-MALONE[10] (EPA code: 30K37[11]), a 1st order stream crosses the eastern portion of the site travelling in a southern direction. The KILBEG-MALONE travels 156m from the closed landfill site before feeding into the LISDUFF 30[12] (EPA code: 30L43[13]). The LISDUFF 30 then travels a further 2km before feeding into the Robe[14] River (EPA code: 30R01[15]). From where the LISDUFF 30 enters the Robe River, to Lough Mask there is 21.68km (direct distance) and from where the stream leaves the closed landfill to the point which the Robe River feeds into Lough Mask there is a direct distance of 21.8km and an instream distance of 44km.

3. OVERVIEW OF THE CONSTRUCTION WORKS

3.1 Construction Period

The construction period for the proposed development has been estimated to be in the region of 6 to 8 months.

3.2 Construction Staffing and Machinery

It is estimated that approximately 8-10 construction staff will be tasked with implementing the works over the course of the construction phase, this will be downgraded to 1 during the operational phase to allow for the periodic maintenance and inspection of the site.

A 360 degree excavator (s), articulated dumper (s), roller compactor (s) will be utilized for the reprofiling of the closed landfill while HGV tippers will be required for the importations of subsoils on site.

3.3 Construction Phase

It should be noted at this stage of the report that the 'construction' phase of the project relates to the remediation 'works' to be undertaken in the case of a closed landfill, as well as enabling works.

The construction period for the proposed development has been estimated to be in the region of 6-8 months.

A detailed design will be prepared for the works prior to commencement. The works will take place in accordance with this Construction Environmental Management Plan.

The remediation works will include:

- Development of a Temporary Site Compound and Office Area
- Site Clearance.
- Invasive Species Management
- Grading/profiling of existing site area.
- Installation of an engineered landfill capping system.
- Landscaping.

The following will be carried out on-site following on from completion of the proposed development works:

- Ongoing environmental monitoring.
- Oxidation of methane in landfill gas
- Maintenance of engineered cap on-site.
- Maintenance of surface water drainage system on-site.

3.3.1 Development of Temporary Site Compound and Office Area

The temporary site compound shall comprise a materials storage area, site offices and a parking area. Material storage compound, parking area and site offices in the form of portacabins and site canteen/welfare facilities (Contractor and Employers Representatives) will be provided to the north-east of the site outside the footprint of the capping area. The temporary site compound shall be founded on a small area that will be levelled, compacted and overlaid with gravel surfacing overlying a geogrid and geotextile. These materials will be removed from site following completion of the works.

Existing access to the site off the N17 will be extended to the proposed temporary site compound and will be re-surfaced with Clause 804.

Waste from the welfare facilities (i.e., Portaloo(s)) will be stored temporarily prior to disposal at a licensed wastewater treatment plant.

Generators will be used on-site for power supply during the temporary works. Water will be provided via water tankers.

Periodic road sweeping will be required where necessary.

3.3.2 Site Clearance

Following completion of the invasive species management, overgrown vegetation on the central area of the site will be cut back, mulched and re-spread on-site. Any vegetation left will be dispatched to an authorized waste facility for disposal.

A Demolition and Site Clearance Plan enclosed with this application shows the areas of dense vegetation that will be cleared from the site and the areas of existing fencing which will be demolished during the works (Drawing Reference: P21-287-0100-0005).

3.3.3 Invasive Species Management

The full extent of Invasive Species rhizomal growth including potential vector material will be removed and encapsulated in a dedicated geocomposite lined invasive species management cell. Upon completion of the excavation works the lined cell will be buried with a minimum 2.0m cover within a dedicated “fill” location within the waste body prior to placing the engineered cap.

Respective areas where invasive species are present will be isolated and have appropriate signage following the completion of the proposed works.

The Proposed Locations for Japanese Knotweed Burial is shown in a drawing enclosed with this planning application (Drawing Reference: P21-287-0100-0014).

3.3.4 Grading/Profiling of Existing Profile

The existing waste body was covered following cessation of waste filling with an intermediate soil cap.

The existing finished surface will require re-profiling to facilitate:

- Surface and sub surface drainage.
- Safe execution of the site remediation works.
- Safe access for maintenance of the cap.

Re-profiling will principally involve the (shallow) cutting of material at local high spots. These "cut" materials will be used as "fill" in local depressions. All cut and fill works will be carried out within the site boundary.

Thereafter imported granular "dust" material 50mm to 100mm thick will be used to provide formation for the engineered cap.

The re-profiled surface will provide the foundation for the engineered landfill cap (Drawing Reference: P21-287-0100-0010).

3.3.5 Installation of Engineered Landfill Capping System

The engineered landfill cap "barrier" system will:

- Cover an area of approximately 38,000m².
- Isolate the waste body from rainfall inputs which might otherwise produce leachate. This will protect underlying ground water and adjacent surface waters.
- Minimise the potential for uncontrolled landfill gas migration to the atmosphere or adjacent lands.
- Provide a physical barrier between the finished surface and buried wastes.
- Facilitate controlled discharge of surface water runoff and sub surface drainage flows into the receiving surface waters.

The cap shall comprise of the following:

- Vertical Wells
- A passive below liner landfill gas venting system.
- A LLDPE barrier to isolate the waste body from rainfall inputs and prevent uncontrolled fugitive gas emissions from the waste body.
- Over liner gas management system.
- Landfill gas compound.
- A subsurface drainage system.
- A surface drainage system.
- A subsoil layer average thickness 850 mm.
- A topsoil layer average thickness 150 mm barrier.

The Proposed Landfill Capping Area is shown in a drawing enclosed with this planning application (Drawing Reference: P21-287-0100-0009).

Vertical Wells

Vertical wells shall be installed within the waste body prior to reprofiling works. Well arisings will be placed in dedicated low spots on site prior to re-profiling. Well arisings will be covered at the end of each working day to minimise odour nuisance. Wells will be connected to over liner gas collection pipework to the gas management compound.

Well diameter will comprise a slotted HDPE pipe with a gravel surround.

Below Liner Landfill Gas System

Currently landfill gas as may be present vents gas to atmosphere via diffuse surface emissions. Once the LLDPE barrier is installed this preferential pathway to atmosphere will be isolated.

Below the LLDPE barrier a gas collection geocomposite and pipework system will be constructed to collect and direct landfill gas as may be present to the proposed temporary gas compound to manage landfill gas via passive ventilation.

The below liner gas collection geocomposite is a cuspated synthetic product that is rolled out above the granular "dust" material overlying the re-profiled intermediate cap which overlies the waste. The gas collection geocomposite forms a "cavity" to intercept gas emissions from the underlying body.

Gas collection pipework will be slotted and laid in gravel surround below the gas collection geocomposite and it will facilitate collection of landfill gas; and soakage, if required, of condensate or other as may collect in pipework.

Landfill gas collected in the under-liner gas system will be transferred via solid HDPE pipes and terminate in the landfill gas management compound.

The Proposed Passive Gas Collection System has been enclosed with this planning application (Drawing Reference: P21-287-0200-0001 & P21-287-0200-0002).

LLDPE Barrier

The LLDPE barrier will be a 1.0 mm thick "plastic" sheet that is impermeable to both water and gas. It prevents gas escaping into the overlying soils and stops water from rainfall entering the underlying waste body.

The LLDPE sheets will be welded at joints and will terminate in a vertical cut-off trench about the perimeter of the site.

Over-liner Gas System

Over-liner HDPE solid pipework will convey gas from vertical wells to the gas management compound.

Connections to wells will be via below ground valve chambers and/or above ground manifold boxed less than 1.0 m in height. All above ground structures will be fenced using stock proof fencing or similar approve.

Landfill Gas Compound

The under and over liner gas pipe systems will terminate in the gas management compound.

Landfill gas quality will change over time. Subject to landfill gas pumping trials and the calorific value/quality of the landfill gas present at the site, landfill gas will be either vented to atmosphere via vent stacks or oxidised prior to venting.

Oxidation will be carried out using a biological filter recessed into the cap to facilitate passive venting to atmosphere.

The biological filter and vent will be located in the landfill gas compound. The compound will be circa. 10.0 m wide by 20.0 m long and contained within stock proof fencing.

Alternatively, the vent stack will comprise a vertical pipe 300 mm diameter with a cowl and/or carbon filter located at a height of not less than 3.0 m above surrounding ground level.

The compound will also have provision for temporary plant to accommodate: gas pumping trials, or oxidation by high temperature flaring, if required.

Subsurface Drainage

The over liner sub surface drainage collection geocomposite is a cuspated synthetic product that is rolled out above the LLDPE barrier. It forms a “cavity” to intercept rainfall inputs into the cap. Subsurface drainage flows from the drainage geocomposite are transferred via a supporting pipework system to a surface drainage system at the toe of the cap and ultimately to the downstream watercourse.

A drawing showing the proposed surface and subsurface drainage system is enclosed with this planning application (Drawing Reference: P21-287-0300-0001).

Surface Drainage

French drains around the capping perimeter will collect and direct surface water runoff to the receiving watercourses. Proposed French drains will be provided with 300 mm diameter HDPE SDR 17 slotted pipes.

A drawing showing the proposed surface and subsurface drainage system is enclosed with this planning application (Drawing Reference: P21-287-0300-0001).

Subsoil Layer

Suitably sourced subsoils will then be imported to the site and placed atop of the sub surface drainage geocomposite and /or geogrid on side slopes. The subsoil layer will generally be 850mm deep.

The purpose of the subsoil layer will be to protect the synthetic geocomposite materials and to support landscaping.

Topsoil Layer

Suitable sourced topsoil will be placed atop the subsoil. The topsoil will have no stones greater than 50 mm diameter. Stones greater than 50 mm will be removed by a proprietary stone picker or similar prior to seeding.

The topsoil layer will be 150 mm deep.

Stones will be reused on site in site roads or as fill to sub surface drains.

3.3.5.1 Temporary Works

Leachate Management

Storage tanks will be provided for the safe storage of any leachate arisings during the construction works. Leachate arising during construction works will be disposed at a licensed wastewater treatment plant.

Daily Cover of Exposed Waste

In the unlikely event that waste is exposed it will be covered with soil or similar approved at the close of each working day.

Suspended Solid Management

Suspended solids will be prevented from entering watercourses by installing silt fences around the site perimeter and around stockpiles.

A drawing showing the proposed silt fences is enclosed with this planning application (Drawing Reference: P21-287-0100-0007).

Odour Management

Odour management is not expected to be an issue as the waste is older than 25 years and the works have been designed to reduce the risk of exposing waste.

In the event that it is exposed, waste will be covered up at the end of each working day.

Traffic Management

The Contractor will be required to implement a traffic management plan to manage safe access and egress of construction vehicles from the site.

Stock Proof Fencing

Clearance of shrub on the perimeter will result in damage to exiting stock proof fencing. Following placement of the cap a replacement perimeter stock proof fence 1.3 m high will be installed around the landfill footprint.

The existing access gate to the site will be replaced. Redundant fences and gates will be transported and disposed of offsite in a licenced facility.

Installation of Landfill Gas/Leachate Management Infrastructure

New monitoring wells (3 no. ground water and landfill gas monitoring and 2 no. groundwater monitoring wells) will be installed to monitor landfill gas and groundwater. Arisings from boreholes will be managed on site below the LLDPE barrier and gas collection geocomposite.

Monitoring wells will have a chamber and a cover atop the wells at the same elevation as the surrounding ground. The wells will have monitoring ports to support monitoring of landfill gas quality and or groundwater quality as may be required by the Environmental Protection Agency (EPA).

The construction works will make provision for additional wells within the waste body and ports will be installed at wells heads or manifolds to support monitoring of gas quality and pressure.

Existing wells (2 no. groundwater monitoring wells) as are present within the waste footprint will be retained and incorporated into the cap to support future environmental monitoring as may be required by the EPA.

A drawing showing the existing and proposed monitoring wells is enclosed with this planning application (Drawing Reference: P21-287-0100-0006).

Grass Cover/Landscaping for Pasture

Post capping and placement of the subsoils and topsoil layers it is proposed to landscape the site using a high value native grass cover.

Grass is used to prevent erosion of the soils and to provide an attractive final visual appearance for the site.

3.4 Construction Working Hours

The hours of construction activity will avoid unsociable hours and will be agreed with the planning authority in advance of site start. It is anticipated that this will restrict working hours at the site during the construction phase to between 07:00 to 19:00 Monday to Saturday inclusive. Work on Sundays or public holidays will only be conducted in exceptional circumstances and subject to prior notification insofar as possible with the local community.

4. ENVIRONMENTAL MANAGEMENT PLAN

4.1 Introduction

This Environmental Management Plan (EMP) defines the project obligations, Environmental Management System (EMS) and environment mitigation measures relating primarily to the construction phase of the proposed works.

This EMP describes how the Contractor for the construction works will implement a site Environmental Management System (EMS) on this project to meet the specified contractual, regulatory and statutory requirements and mitigation measures. This plan will be further developed and expanded following the grant of planning permission and appointment of the Contractor for the construction works. Please note that some items in this plan can only be finalised with appropriate input from the Contractor who will carry out the construction works and once the planning conditions attached to any grant of planning are known. It will be the Contractor's contractual responsibility to implement an effective environmental management system to ensure that the Boards **environmental** requirements for the construction of this project are achieved.

All site personnel will be required to be familiar with the environmental management plan's requirements as related to their role on site. The plan describes the project, sets out the environmental procedures that will be adopted on site and outlines the key performance indicators for the site.

- The EMP is a controlled document and will be reviewed and revised as necessary.
- A copy of the EMP will be located at the proposed temporary contractors compound.
- All employees, suppliers and Contractors whose work activities cause/could cause impacts on the environment will be made aware of the EMP and its contents.

4.2 Project Obligations

During the remediation phase of the proposed development several environmental management obligations must be implemented and achieved by Mayo County Council and the Contractor. In addition to statutory obligations, there are several specific obligations set out in the accompanying Natura Impact Statement (NIS). When development consent is granted, there is also likely to be planning conditions, with which Mayo County Council must comply. At the outset however, this CEMP has been prepared for the purpose of ensuring no adverse environmental impacts occur as a consequence of the proposed development. The Contractor and all of its sub-Contractors will be made fully aware of and be contractually required to adhere to all environmental obligations.

4.2.1 NIS Obligations

The accompanying NIS, which is provided under a separate cover, identifies measures that will be put in place to mitigate the potential environmental impacts arising from the construction phase of the proposed project.

4.2.2 Planning Permission Obligations

Should the remediation works be consented by An Bord Pleanála, the planning conditions will be complied with and should be read in conjunction with the project CEMP and other related reports prepared by and on behalf of Mayo County Council.

4.2.3 Other Obligations

The Contractor will liaise directly with Mayo County Council and An Garda Síochána in relation to securing any necessary permits to allow the works to take place including for example (non-exhaustive list):

1. Commencement notice;
2. Special Permits in relation to oversized vehicles on public roads, if required.

Mayo County Council will continue to liaise closely with the local residents, especially near neighbours and landowners in relation to works and all reasonable steps will be taken to minimise the impact of the development.

4.3 Environmental Management System

The Environmental Management System (EMS), is outlined in the sections below.

4.3.1 Environmental Policy

The Contractor is responsible for preparing and maintaining an Environmental Policy for the site. The policy should be appropriate to the project, commit to continuous improvement and compliance with legal requirements and provide a framework for objectives and targets. This will be communicated to all site personnel and will be available on-site notice boards.

4.3.2 Training, Awareness and Competency

All site personnel will receive environmental awareness information as part of their initial site induction and briefing. The detail of the information should be tailored to the scope of their work on site. The Contractor for the construction works may decide to conduct the environmental awareness training at the same time as health and safety training (often referred to as Site Inductions).

This will ensure that personnel are familiar with the environmental aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures.

The CEMP will be retained in the site management office during the project. The environmental performance at the site will be on the agenda of the monthly project management meetings for the project.

Elements of the CEMP will be discussed at these meetings including objectives and targets, the effectiveness of environmental procedures, etc. Two-way communication will be encouraged by inviting all personnel to offer their comments on environmental performance at the site.

4.3.3 Register of Environmental Aspects

The Contractor is responsible for preparing and maintaining a *Register of Environmental Aspects* pertaining to the site. This register will identify the environmental aspects associated with activities onsite and determine which aspects have or can have a significant impact on the environment. Risks and Opportunities associated with environmental aspects will be identified. Life-cycle impacts (i.e. upstream and downstream impacts) will be identified if present.

4.3.4 Register of Legislation

The Contractor is responsible for preparing and maintaining a register of key environmental legislation pertaining to the site. This register will reference all current environmental legislation and will be inspected, reviewed and updated regularly to ensure compliance.

4.3.5 Objectives and Targets

Objectives and targets are required to be set to ensure that the project can be constructed and operated in full accordance with the NIS, planning conditions and legislative requirements, with minimal impact on the environment.

Environmental objectives are the broad goals that the Contractor must set in order to improve environmental performance. Environmental targets are set performance measurements (key performance indicators or KPI's) that must be met in order to realise a given objective.

The Contractor will set objectives based on each significant environmental impact. Key objectives are likely to include the following:

- To ensure that nearby rivers and streams are not negatively impacted by construction works.
- To ensure that humans are not negatively impacted by dust generated by construction works.
- To ensure that humans are not negatively impacted by noise generated by construction works.
- To ensure that impacts to habitats and wildlife are minimised during works.
- To ensure that a waste management plan for this site will be fully implemented.
- To ensure that the visual impact during the construction work is minimised.
- To ensure that the proposed development is constructed in compliance with the EIA Screening Report.
- To prevent adverse environmental impacts due to noise, vibration or dust.

Performance in relation to each of these objectives will be reviewed on a regular basis by means of inspections, audits, monitoring programmes, etc.

4.3.6 Non-Conformance, Corrective and Preventative Actions

Non-conformance notices will be issued in the following cases:

- Where site activities do not conform with the requirements of the EMS.
- Where environmental monitoring shows that there is a breach of an emission limit value or Environmental Quality Standard on-site.
- Where there is a breach of an EPA condition imposed under the EPA's CoA for the site.
- Where there is a complaint relating to site activities.

Non-conformance is the situation where essential components of the EMS are absent or dysfunctional, or where there is insufficient control of the activities and processes to the extent that the functionality of the EMS in terms of the policy, objectives and management programmes, is compromised. A non-conformance register should be controlled by the Contractor.

In the event of non-conformance with any of the above, the following must be undertaken:

- Investigate cause of the non-compliance.
- Develop a plan for correction of the non-compliance.
- Determine preventive measures and ensure they are effective.
- Verify the effectiveness of the correction of the non-compliance.
- Ensure that any procedures affected by the corrective action taken are revised accordingly.

Responsibility must be designated for the investigation, correction, mitigation and prevention of non-conformance.

Internal Audits

Periodic internal audits will be carried out under the EMS to ensure that all site activities conform to the requirements of the EMS. Non-conformances identified during Internal Audits will be addressed by way of the Non-conformance management process detailed above. Opportunities for Improvement identified during internal audits will be communicated to the relevant responsible personnel.

4.3.7 EMS Documentation

The Contractor is required to keep the following documentation in relation to the environmental management of the project (as a minimum):

- Construction Environmental Management Plan for the proposed development
- Register of Environmental Aspects/Impacts
- Register of Planning Conditions
- Monitoring Records

- Minutes of Meetings
- Training Records
- Audit and Review Records

All of these documents and records are to be available for inspection in the site office. The documentation shall be up to date and shall be reviewed on a regular basis with revisions controlled in accordance with the site quality plan.

It will be a requirement to develop and maintain a Management and Monitoring programme in accordance with Condition 3 of the CoA for the site.

4.3.8 Control of Documents

The Contractor will establish, implement and maintain a procedure to control CEMP documents and records so they are clearly identifiable, organised, current, easily located and revised when necessary.

4.4 Ecological Management Plan

FT was commissioned on behalf of Mayo County Council to undertake an Appropriate Assessment Screening and Natura Impact Statement which accompany the application for the proposed landfill remediation.

The ecology appraisal involved a field assessment and a desktop review of relevant data available for the study site and locality.

4.4.1 Designated Sites

Potential impacts on European sites are considered in the Natura Impact Statement accompanying the Planning Application.

4.4.2 Habitats

The habitat types (according to the Fossitt, 2000 classification system) identified during the ecological surveys conducted at the site on the 22nd November of 2021 are outlined below.

- *Wet Grassland GS4:* Dominant: Rosebay Willowherb. Abundant: Creeping buttercup Frequent: Common rush, Common Couch, Nettle, bramble, bracken, thistle. Occasional: White mustard, hogweed, water figwort, bush vetch. Rare: Ribwort plantain
- *Wet heath/Cutover bog HH3/PB4:* Abundant: Common couch, annual meadowgrass, rosebay willowherb, Common rush, Juniper haircap, *Hypnum* sp. Common heather (locally abundant. Occasional: Bracken, Birch. Frequent: Common bent.

- *WD4: Douglas fir plantation*. Lots of surfaced material. Abundant Ivy. Frequent bramble and red stemmed feather moss. Occasional rosebay willowherb and bracken. Area of standing water where plantation meets bog on map, likely downhill flow here. (Figure 3).
- *Drainage ditches FW4*: A number ran through the site, not mapped previously. Areas with dominant duckweed. Frequent common rush. Occasional bull rush. Generally slow flowing or standing, with grass cover in places. Possibly a spring in boggy area.
- *Wet willow-alder-ash woodland WN6* dominated by goat willow. Abundant grasses, creeping buttercup, Frequent: *Plagiomnium* moss, nettle

4.4.3 Invasive Species

As previously noted, a number of invasive species are present within the footprint of the closed landfill.

During a field survey in November 2021, the following invasive species were recorded within the footprint of the remediation site:

- Japanese knotweed (*Fallopia japonica*);
- Winter heliotrope (*Petasites fragrans*); and
- Cherry laurel (*Prunus laurocerasus*).

4.4.4 Construction/Operational Stage Mitigation Measures

Mitigation by Avoidance and Design

The following measures are incorporated into the proposed remediation plan to reduce impacts on designated sites, flora and fauna through avoidance and design:

- Preparation of an Invasive Species Management Plan (See Appendix 2)
- Stock proof fencing will be installed which will prevent spread of invasive species
- Installation of a surface drainage system to prevent leachate entry to watercourses
- Capping the landfill to isolate the waste from rainfall, preventing leachate entry to watercourses

Further mitigation measures prescribed to avoid or reduce potential for the proposed project and remediated site to have an adverse effect on the integrity/conservation objectives of the Lough Carra/Mask Complex SAC and Lough Mask SPA are outlined in section 4.4.5 below. These mitigation measures also mitigate against cumulative impacts.

4.4.5 General Mitigation Measures

The following general mitigation measures will be adopted and implemented on-site to minimize potential impact on ecological receptors.

A suitably qualified person will be appointed to ensure the effective operation and maintenance of mitigation measures during the construction process.

- Compact surface of stored/stockpiled soils during the reprofiling and capping works.
- In the event of exposure of uncovered waste, waste will be relocated to a low-lying location on site and soil will be compacted on top of the waste before the end of the working day.
- Weather forecasts will be reviewed daily, and earthworks will not be undertaken during periods of heavy rainfall.
- Mobile storage tanks will be provided to store leachate arising during construction works. This leachate will be disposed of to a licensed wastewater treatment plant.
- Temporary silt fences will be installed along the site perimeter and around soil stockpiles.
- The access track will be resurfaced with Clause 804 with minimal fines.
- Refuelling of plant during construction will only be carried out at a designated refuelling area.
- Appropriate spill control equipment, such as oil soakage pads, will be kept within the construction area and in each item of plant to deal with any accidental spillage.
- Portaloos and/or containerised toilets and welfare units will be used to provide toilet facilities for site personnel. Sanitary waste will be removed from site by a licensed waste disposal contractor.
- The Contractor carrying out the works will be required to provide temporary works to prevent soil being carried out onto the N17. In addition the Contractor will be required to provide backup provision by way of a road sweeper to clean up fines as may be present.
- Existing invasive species management undertaken in line with the invasive species management plan shall continue during remediation works as required.
- Supervision of control measures and treatment works by an appropriately qualified ecologist or invasive species specialist is required for the duration of the works.
- Raising awareness to site workers via toolbox talks given by a suitably qualified person as part of site introduction; informing workers what to look out for and what procedure to follow if they observe an invasive species.
- Where invasive species have been physically removed and soil disturbed, this soil will be seeded or replanted with native plant species. This will prevent erosion and the easy colonisation of bare soil by invasive species in the area.
- Signs will warn people working within the site that there is invasive species contamination.
- Ensure appropriate biosecurity measure are in place, these will include the Check Clean Dry method, along with those outlined below:
  - Remove the build-up of soil on equipment
  - Keep equipment clean
  - Do not move fouled equipment from one site to another,
  - Footwear and clothing of operatives working near invasive species should be checked for seeds, fruits, knotweed rhizomes or other viable material before exiting the site
  - All vehicles exiting the site will be examined to prevent the transport of rhizomes, seeds and other plant material.
  - Soil, rhizomes and other material cleaned down in the excavation area will be buried in the burial cell.

- No contaminated soil (contamination from non-native species) or vegetation shall be removed from site unless suitable biosecurity is observed and removal by an appropriately licensed waste contractor to a suitably licenced facility.
- New sightings of the invasive plant species identified within the site shall be relayed to the contractor for invasive species control. These areas shall follow the same protocol as the current infected areas.
- It is possible, particularly in the first year of control, that new plants will sprout following the initial removal/treatment, either because shade suppression will be reduced or due to soil disturbance. As such, several additional visits will likely be required. Three visits, May/June, July/August and September/October should be sufficient to catch all regrowth, although, a cautionary approach is advisable.
- Plants that germinate after September/October are very unlikely to have sufficient time to complete their life cycle and produce seeds.
- The capped surface will be vegetated post-construction to prevent the generation of silted runoff.
- Post construction the LLDPE barrier will provide an engineered barrier that will isolate the waste body from rainfall inputs and prevent leachate production that might otherwise contaminate groundwater.
- The constructed surface drainage system will filter surface water before it enters the receiving watercourses.

4.5 Noise, Vibration, Dust and Air Quality Management Plan

4.5.1 Potential Impacts During the Construction Phase

Noise from the construction phase would arise from deliveries and/or removal of material to and from site, top-soil excavation, preparation of access roads & drainage and concrete pouring of foundations/footings where necessary.

Dust emissions arise when particulate matter becomes airborne making it available to be carried downwind from the source. Dust emissions can lead to elevated PM_{10} and $PM_{2.5}$ concentrations and may also cause dust soiling.

The amount of dust generated and emitted from a working site and the potential impact on surrounding areas varies according to:

- The type and quantity of material and working methods;
- Distance between site activities and sensitive receptors;
- Climate/local meteorology and topography.

The principal sources of potential air emissions during the construction of the proposed development include:

- Dust arising from earthworks
- Dust arising from the movement of construction vehicles over land as well as the transporting of materials to the site of the proposed development.

- Dust arising from the temporary storage of any excavated materials and wind blowing over unprotected, unconsolidated soils.
- Dust arising from uncovered truckloads, the movement of material around the site and the loading and unloading of aggregates and of materials within the site.
- Pollutants arising from temporary diesel generators.

4.5.2 Construction Stage Mitigation Measures

During the construction phase there is potential for increased ambient noise levels and potential temporary impacts on residential dwellings in the surrounding area of the site during the proposed earthworks and installation of site infrastructure using plant and machinery. If noise emissions from these activities are an issue, the scheduling of construction activity will be addressed such that durations of construction activity likely to exceed the 65 dB $L_{Aeq,1hr}$ noise limit do not occur simultaneously with other construction activity.

Generally, construction works will be carried out in accordance with best practice and in line with recommendations contained within BS 5228-1:2009+A1:2014.

To mitigate against the impacts of noise on the local community during construction, the following specific measures are proposed:

- A pre-construction commitment to managing noise levels will be agreed through notification and consultation with affected parties, if deemed necessary.
- Working hours at the site during the installation phase will be limited to 07:00 to 19:00 Monday to Saturday inclusive. Work on Sundays or public holidays will only be conducted in exceptional circumstances and subject to prior notification insofar as possible with the local community.
- Construction contractors will be required to comply with the requirements of the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations, 1988 as amended in 1990 and 1996 (S.I. No. 320 of 1988, S.I. No. 297 of 1990 and S.I. No. 359 of 1996), and the Safety, Health and Welfare at Work (Control of Noise at Work) Regulations, 2006 (S.I. No. 371 of 2006).

The main control measures will involve control of noise at source measures using the following methods in line with Clause 8 ‘Control of noise’ of BS 5228-1:2009+A1:2014:

- Operators of all mobile equipment will be instructed to avoid unnecessary revving of machinery (Clause 8.2.1 General).
- Use of appropriate plant and equipment where possible with low noise level generation where possible (Clause 8.2.2 Specification and substitution).
- All construction plant to be used on site should have effective well-maintained silencers (Clause 8.2.3 Modification of existing plant and equipment).
- Noise generating equipment will be located as far as possible away from local noise sensitive areas identified (Clause 8.2.5 Use and siting of equipment); and

- Regular and effective maintenance of site machinery including a full maintenance schedule to ensure that all pieces of equipment are in good working order. With efficient use of well-maintained mobile equipment, considerably lower noise levels than those predicted can be attained (clause 8.2.6 Maintenance).

In addition, the following best practice measures are proposed:

- Training of site staff in the proper use and maintenance of tools and equipment.
- Avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment.
- Machines that could be in intermittent use will be shut down between work periods or will be throttled down to a minimum.
- Plant start-up will be sequential rather than all together.
- Internal access tracks to be well maintained.
- Plant known to emit noise strongly in one direction will, when possible, be orientated so that the noise is directed away from noise-sensitive locations.

Mitigation measures to reduce dust nuisance and to minimise impact on air quality will be employed during the construction phase of the project. These mitigation measures will include the following:

- The Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented, and that dust impacts and nuisance are minimised.
- The drop height of materials will be minimised to a practicable level, to limit fugitive dust generation.
- Gravel will be used at site exit points to remove possible caked on dirt from tyres and tracks before travelling along public roads. Periodic road sweeping, as necessary, shall be put in place at the site entry/exit points.
- The site supervisor will undertake daily visual inspections to examine dust generation.
- The working area will be kept as small as possible so as to minimise potential dust generation.
- To suppress the migration of dust from site, a water bowser will be available to spray work areas and access roads, especially during periods where excavation works coincide with dry periods of weather or existing activities.
- All loads with potential to cause dust nuisance will be covered using strong, waterproof sheets such as tarpaulin sheets and will not be overloaded. This will minimise the potential for fugitive emissions during transport.
- All other stockpiles will be kept damp and covered to prevent windblown dust emissions.
- Construction vehicles and plant will be routinely serviced to minimise the exhaust emissions during construction. Vehicles will not be left running unnecessarily and low emission fuels will be used where possible.

4.6 Surface Water Management Plan

4.6.1 Adjacent Watercourses

The KILBEG-MALONE (EPA code: 30K3711), a 1st order stream crosses the eastern portion of the site travelling in a southern direction. After flowing for 44km, this stream ultimately enters Lough Mask via the LISDUFF 30 (EPA code: 30L4313) and Robe River (EPA code: 30R0115).

According to the EPA map viewer, the site is located within the Corrib catchment[5] (hydrometric area 30[6]), sub catchment Robe_SC_010[7] (Code: 30_9[8]) and Sub-basin Robe_020[9]. The KILBEG-MALONE[10] (EPA code: 30K37[11]), a 1st order stream crosses the eastern portion of the site travelling in a southern direction. The KILBEG-MALONE travels 156m from the closed landfill site before feeding into the LISDUFF 30[12] (EPA code: 30L43[13]). The LISDUFF 30 then travels a further 2km before feeding into the Robe[14] River (EPA code: 30R01[15]). From where the LISDUFF 30 enters the Robe River, to Lough Mask there is 21.68km (direct distance) and from where the stream leaves the closed landfill to the point which the Robe River feeds into Lough Mask there is a direct distance of 21.8km and an instream distance of 44km.

4.6.2 Proposed Drainage

French drains around the capping perimeter will collect and direct surface water runoff to the receiving watercourses. Proposed French drains will be provided with 300 mm diameter HDPE SDR 17 slotted pipes.

A drawing showing the proposed surface and subsurface drainage system is enclosed with this planning application (Drawing Reference: P21-287-0300-0001).

4.6.3 Construction Stage Impact and Mitigation

The impact of the remediation works during the construction phase is not significant for hydrology and water quality. However, the following mitigation measures to reduce potential impacts during the construction stage are outlined below:

- Weather forecasts will be reviewed on a daily basis and earthworks will not be undertaken during periods of heavy rainfall.
- The contractor will be responsible to ensure the effective operation and maintenance of drainage and other mitigation measures during the construction process. The operations management of the subject development will include regular monitoring of the drainage system and maintenance as required.
- Silt fencing shall be located adjacent to all water courses.
- A series of silt fences shall be securely placed within the outflow channel draining the wetland to the east of the landfill. These shall be installed prior to any works.
- Dewatering flows from excavations will be managed to prevent elevated suspended solids entering the watercourse by use of silt fencing.
- Temporary storage tanks in the form of IBC's will be provided for the safe storage of any leachate arisings during the construction works. Leachate arising during construction works will be disposed at a licensed wastewater treatment plant.

- Emergency drip trays and spill kits will be kept available on site, to ensure that any spills from vehicles are contained and removed off site.
- Portaloos and/or containerised toilets and welfare units will be used to provide toilet facilities for site personnel. Sanitary waste will be removed from site via a licenced waste disposal contractor.
- Access track construction methodology to reduce suspended solids generation.

4.7 Soil Management Plan

It is intended to maintain an earthworks balance on site, with all excavated material re-used within the site where possible, thereby minimising the need for removal of any materials for off-site disposal. This will in turn lead to the reduction of noise and dust associated with construction traffic.

Excavation and backfilling will take place over short lengths. There will be no permanent spoil heaps at the site of the proposed development.

Excavation/capping works will be monitored by suitably qualified and experienced personnel.

The programming of the works will be such that earthworks are not scheduled to be carried out during severe weather conditions. Where such weather is forecast, suitable measures will be taken to secure the works. Due to the possibility of soil-borne diseases, all topsoil/peat recovered from the site will remain on the site. Topsoil will be used for landscaping berms alongside existing and new access tracks where suitable and will also be used for reinstatement and landscaping purposes.

No off-site disposal of soil will be required from the site and no spoil stockpiles will be left on site after construction is completed.

In addition to the above, lubricants and hydraulic fluids for equipment will be stored within an appropriately bunded storage unit in the proposed temporary contractors compound. Refuelling will be carried out directly from delivery vehicles at designated refuelling areas. Specific mitigation measures relating to the management of hydrocarbons spills are outlined below:

- Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage.
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the site and properly disposed of.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- Appropriate spill control equipment, such as oil soakage pads, will be kept within the proposed temporary contractors compound and in each item of plant to deal with any accidental spillage.
- Drip trays and spill kits will be kept available on site, to ensure that any spills from vehicles are contained and removed off site.

4.8 Waste Management Plan

It will be the objective of Mayo County Council in conjunction with the appointed contractor to prevent, reduce, reuse and recover as much of the waste generated on site as practicable (in accordance with Waste Hierarchy Principles) and to ensure the appropriate transport and disposal of residual waste off site. This is in line with the relevant National Waste Management Guidelines and the European Waste Management Hierarchy, as enshrined in the Waste Management Act 1996, as amended.

4.8.1 Assignment of Responsible Personnel

It will be the responsibility of the contractor for the construction works (when appointed) to nominate a suitable site representative such as a Project Manager, Site Manager or Site Engineer as Waste Manager who will have overall responsibility for the management of waste. The waste manager will have responsibility to instruct all site personnel including sub-contractors to comply with on-site requirements.

4.8.2 Waste Generated

It is envisaged that all excavated materials on-site will be reutilized on-site during reprofiling of the site.

Any waste materials generated on-site during the construction of the proposed development will be handled and managed in accordance with the requirements of the Waste Management Act 1996, as amended, and associated Regulations. All waste will be stored in segregated waste containers at the temporary construction compound and collected separately by appropriately licensed waste contractors. All waste materials transferred off-site for disposal or recovery will be taken only to suitably permitted/licensed waste facilities.

4.8.3 Waste Management During the Construction Phase

Any waste generated during the development construction phase will be collected, source separated and stored in dedicated receptacles at the temporary compounds during construction.

Typical categories of waste generated during the construction of this type of project:

- Municipal solid waste from the office and canteen
- Construction and demolition waste
- Waste oil/hydrocarbons
- Paper/cardboard/plastic wrapping
- Timber
- Steel.

As above-noted, it will be the responsibility of the contractor for the main construction works (when appointed) to nominate a suitable site representative such as a Project Manager, Site Manager or Site Engineer as Waste Manager who will have overall responsibility for the management of waste. The waste manager will have responsibility to instruct all site personnel including sub-contractors to comply with on-site requirements.

Where waste is generated, every effort will be made to separate and segregate the different waste streams.

Table 4-1: Principal Wastes Generated during the Construction Phase

Waste	Source
Timber	Temporary supports and packaging waste
Miscellaneous materials	Surplus materials from installation works
Lubricating oils, diesel	Unused quantities at end of installation period
Plastics	Packaging waste
Paper/cardboard	Packaging waste
Non-hazardous Office and Canteen Waste	Temporary welfare facilities unit
Food waste	Temporary welfare facilities unit
Sanitary waste	Temporary welfare facilities unit

4.8.4 Installation Stage Waste Reduction

The appointed contractor will make all reasonable effort to minimise the creation of waste throughout the installation stage. This will be achieved through the following measures:

- The ordering of material will be optimised to ensure that only the necessary levels are delivered to site.
- All plant will be serviced before arriving on site. This will reduce the risk of breakdown and the possible generation of water oil on site.
- All operators will be instructed in measures to cut back on the amount of wastage for trimming of materials etc.
- Prefabrication of design elements will be used where suitable to eliminate waste generation on site, and;
- Where materials such as concrete are being ordered, care will be taken when calculating required quantities to reduce wastage.

4.8.5 Construction Material Re-use

Where possible, materials will be re-used onsite for other suitable purposes.

4.8.6 Construction Waste Recycling

Where waste is generated, every effort will be made to recycle it. In order to optimally recycle, waste source segregation of recyclable materials will be undertaken.

Suitable containers will be provided for the storage and collection of source segregated materials. These containers will be clearly labelled and signposted.

The following sourced segregated materials containers will be made available on site at a suitable location:

- Timber;
- Ferrous metals;
- Aluminium;
- Dry mixed recyclables; and
- Packaging waste.

4.8.7 Construction Waste Disposal

Where waste disposal is unavoidable, waste will be disposed of in a manner not likely to cause environmental damage:

- All waste materials will be stored in suitable locations and enclosed containers where suitable to avoid pollution and generation of wind-blown debris.
- All waste will be collected by a suitably competent and permitted waste collection contractor;
- All waste will be dispatched to an appropriate authorized waste facility
- Dispatch to a waste recovery/recycling facility will be preferred over dispatch to a waste facility involved in waste disposal or energy recovery, and;
- No material will be burned on site under any circumstances.

4.8.8 Training

Copies of the Waste Management Plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the Project Waste Management Plan and informed of the responsibilities that fall upon them as a consequence of its provisions.

It will be the responsibility of the Contractors' appointed Waste Manager to ensure that all personnel are made aware of their responsibilities under the plan via a toolbox talk or otherwise.

4.9 Traffic Management

As with any construction development project, the transport of materials onto the site will give rise to increased traffic and associated impacts. However, due to the very nature of construction these impacts will be temporary.

Materials arising on-site will be reused on-site where possible to minimize traffic movements off-site.

Public perception of the construction phase will be influenced primarily from the impact of traffic movements. The degree of traffic disturbance caused by the construction phase depends on the volume of material imported/exported, the associated civil engineering requirements and the length of the construction period.

Construction traffic will require regular access to the site at varying times throughout the construction phase.

Traffic management procedures to manage traffic effectively on site and in the immediate vicinity of the development, to ensure the continued movement of traffic on the public roads and to minimise disturbance during the transportation of materials.

The site is accessed from the west via the Knock-Claremorris Bypass (N17). The surrounding routes are considered to be acceptable for the level of traffic generated during construction with some mitigation proposed. Similar traffic is currently using these roads to service the farmland and agriculture practices in the area. There should be ample capacity to carry the deliveries associated with the temporary short-term construction activities of the landfill

The construction phase for the proposed works will result in additional traffic on the roads in the vicinity of the development, in particular the N17.

This additional traffic will include:

- Construction worker vehicles;
- Delivery vehicles carrying conventional construction materials e.g. aggregate;
- Delivery vehicles carrying machinery and equipment.

It should be noted however that final selection of construction plant and vehicles may vary depending on suitability, availability, contractor's choice, etc. Plant operators will be responsible for the upkeep and maintenance of construction plant and vehicles, ensuring good working order prior to use. Should emergency maintenance need to be carried out on site, this will be carried out at a designated area away from sensitive receptors and it will be ensured that a spill kit is nearby.

Parking for all site staff vehicles during the Construction phase will be provided adjacent to the construction compound. Parking of construction related vehicles (or queuing) will not be permitted outside the facility gate. This will be achieved using a combination of signage, suitable bollards (if required) and enforcement by site management.

HGVs entering the site shall do so via the proposed access, which will be developed to allow adequate visibility sightlines in accordance with TII Standard DN-GEO-03031: Road Link Design, 2012, and in accordance with Mayo County Development Plan.

Public roads shall be kept free of mud, dust, spillages and debris from the construction site, construction plant or haulage vehicles. Periodic road sweeping, as necessary, shall be put in place at the site entry/exit points.

The roadway on site from the public road entrance, shall be kept free of dust, spillages and debris. Regular watering of the access road will take place and Mayo County Council will liaise with adjacent residences to avoid undue or unnecessary truck movements during un-social hours. .

4.9.1 Consultation and Notification

Traffic Management Co-ordinator

The Contractor will appoint a dedicated competent Traffic Management Coordinator for the duration of this project and this person will be the main point of contact for all matters relating to traffic management on the project.

Induction

Prior to the works commencing, the Traffic Management Coordinator will carry out an induction for the materials haulage contractor staff to inform them of the traffic requirements in relation to vehicle movements. Traffic consideration shall form part of the induction process for all site staff also.

An Garda Síochána

Following the appointment of the successful Contractor for the main construction works for this project, the CTMP shall be finalised. The Traffic Management Coordinator will liaise directly with An Garda Síochána in relation to the plan and any concerns/requirements they have will be incorporated in to the plan. The necessary permits (including approved route permits) will be applied for and obtained from An Garda Síochána, if required.

Mayo County Council

The Contractor will liaise directly with Mayo County Council Roads Department in relation to the plan and any necessary permits (including standard permits) will be applied for and obtained from the Roads Department.

5. SAFETY & HEALTH MANAGEMENT PLAN

5.1 Induction

This Safety and Health Management Plan (SHMP) defines the work practices, procedures and management responsibilities relating to the management of health and safety during the design, construction and operation of the proposed development and shall be read in conjunction with the Preliminary Safety & Health Plan prepared for the project by the Project Supervisor for the Design Process. The Safety and Health Management Plan shall be finalised in accordance with this plan following the appointment of the contractor for the construction works.

The SHMP describes how the contractor for the construction works will implement a site safety management system (SMS) on this project to meet the specified contractual, regulatory and statutory requirements, environmental impact statement mitigation measures and planning conditions. It is the contractor's responsibility to implement an effective safety management system to ensure that the Council's safety requirements for the construction of this project are met. Any SMS will incorporate and develop upon any preliminary plans prepared for the project by the Project Supervisor for the Design Process.

All site personnel will be required to be familiar with the requirements of the safety management plan as related to their role on site. The plan describes the project organisation and sets out the health and safety procedures that will be adopted on site:

- The Safety and Health Plan is a controlled document and will be reviewed and revised as necessary.
- A copy of the Safety and Health Plan will be located on/near the site H&S notice board.
- All employees, suppliers and contractors whose work activities cause/could cause impacts on the environment will be made aware of the SHMP and its contents.

The selection criteria for the Contractor for the works will be based on the ability to construct the works in a manner that will not endanger the safety, health and welfare of any parties and competence to fulfil the role of PSCS.

All site personnel will be required to be familiar with the requirements of the Safety and Health Management Plan for the construction phase of the project as related to their role on site. The plan will describe the project organisation and sets out the health and safety procedures that will be adopted on site.

The Safety and Health Plan is a controlled document and will be reviewed and revised as necessary. A copy of the Safety and Health Plan will be located on/near the site H&S notice board. All employees, suppliers and contractors whose work activities cause/could cause impacts on the environment will be made aware of the SHMP and its contents.

Solas Safe Pass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. Public safety will be addressed by restricting site access during construction. Appropriate warning signs will be posted, directing all visitors to the site office.

All personnel on site will wear adequate personal protective equipment (PPE), appropriate for their activity while on site.

In relation to working near overhead electric lines, the contractor will comply with ESB Networks Code of Practice for Avoiding Danger from Overhead Electricity Lines, 2008. Prior to site start, hazard exclusion zones will be established by the main contractor and overhead goalposts will be set up at designated crossing points where plant must pass directly under overhead electricity lines in accordance with ESBN requirements. A minimum 3m exclusion zone for 10kV, 20kV and 38kV overhead lines will be maintained at all times.

5.2 Project Obligations with Respect to Health and Safety

The construction of the proposed development will impose numerous safety management obligations on the Council, designer and contractor. These obligations are set out below. The contractor for the construction works and all of its sub-contractors are to ensure that they are fully aware of and in compliance with these safety obligations.

5.2.1 Statutory Obligations

The Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (Construction) Regulations 2013 place a responsibility on Mayo County Council as the "Client", the Designer, the Project Supervisors and the Contractor.

The Council must:

- Appoint a competent and adequately resourced Supervisor for the Construction Stage (PSCS)
- Be satisfied that the contractor appointed has adequate training, knowledge, experience and resources for the work to be performed.
- Co-operate with the project supervisor and supply necessary information.
- Keep and make available the safety file for the completed structure.
- Provide a copy of the safety and health plan prepared by the PSDP to every person tendering for the project.

The Designers must:

- Identify any hazards that their design may present during construction and subsequent maintenance.
- Eliminate the hazards or reduce the risk.
- Communicate necessary control measures, design assumptions or remaining risks to the PSDP so they can be dealt with in the safety and health plan.
- Co-operate with other designers and the PSDP or PSCP.
- Take account of any existing safety and health plan or safety file.
- Comply with directions issued by the PSDP or PSCS.

The PSDP must:

- Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project.
- Where possible, eliminate the hazards or reduce the risks.
- Communicate necessary control measure, design assumptions or remaining risks to the PSCS so they can be dealt with in the safety and health plan.
- Ensure that the work of designers is coordinated to ensure safety.
- Organise co-operation between designers.
- Prepare a written safety and health plan for any project and deliver it to the client prior to tender.
- Prepare a safety file for the completed structure and give it to the client.

The PSCS must:

- Co-ordinate the identification of hazards, the elimination of the hazards or the reduction of risks during construction
- Develop the Safety and Health Plan initially prepared by the PSDP before construction commences.
- Co-ordinate the implementation of the construction regulations by contractors
- Organise cooperation between contractors and the provision of information.
- Co-ordinate the reporting of accidents to the Authority
- Notify the Authority before construction commences.
- Provide information to the site safety representative.
- Co-ordinate the checking of stage working procedures.
- Co-ordinate measures to restrict entry on to the site.
- Co-ordinate the provision and maintenance of welfare facilities
- Co-ordinate arrangements to ensure that craft, general construction workers and security workers have a Safety Awareness card, e.g. Safe Pass and a Construction Skills card where required.
- Co-ordinate the appointment of a site safety representative where there are more than 20 persons on site.
- Appoint a safety adviser where there are more than 100 on site.
- Provide all necessary safety file information to the PSDP.
- Monitor the compliance of contractors and others and take corrective action where necessary.
- Notify the Authority and the client of non-compliance with any written directions issued.

The Contractor must:

- Co-operate with the PSCS.
- Promptly provide the PSCS with information required for the safety file,
- Comply with directions of the project supervisors.
- Report accidents to the Authority and to the PSCS where an employee cannot perform their normal work for more than 3 days.
- Comply with site rules and the safety and health plan and ensure that your employees comply.
- Identify hazards, eliminate the hazards or reduce risks during construction.
- Facilitate the site safety representative.
- Ensure that relevant workers have a safety awareness card and a construction skills card where required.
- Provide workers with site specific induction.
- Appoint a safety officer where there are more than 20 on site or 30 employed.
- Consult workers with site specific induction.
- Monitor compliance and take corrective action.

Consequently, at all stages of the project there are statutory requirements for the management of safety, health and welfare of all involved in or affected by the development. As previously outlined, this CEMP and specifically the Safety and Health Management Plan addresses key construction management issues associated with the proposed development. This plan will be developed further at the construction stage, on the appointment of the Contractor for the main construction works.

5.2.2 The Preliminary Safety and Health Plan

In accordance with the requirements of the Safety, Health & Welfare at Work (Construction) Regulations 2013, a Preliminary Safety & Health Plan will be required as part of the design process. This plan will be further developed by the PSCS on appointment and maintained as a live document during construction and commissioning of the proposed development.

The safety and health plan is required to include the following information:

- A general description of the project;
- Details of other work activities taking place on site;
- Works involving particular risks;
- The timescale for the project and the basis on which the time frame was established; and
- Conclusions drawn by designers and the PSDP having taken into account the General Principles of Prevention and any relevant Safety and Health Plan or Safety File.

In accordance with the PSDP's procedures, the Preliminary Safety & Health Plan for the proposed development should include the following sections and subsections to ensure that the PSCS is aware of the health and safety issues at tender stage and enable them to price accordingly:

Preamble:

1 General Project Information:

- 1.1 Title
- 1.2 Description of Project
- 1.3 Employer
- 1.4 Designers/Other Consultants
- 1.5 Project Supervisor Design Process
- 1.6 Drawings, Specifications and Other Documents
- 1.7 Intended Contract Commencement Date
- 1.8 Intended Contract Completion Date
- 1.9 Basis for Contract Duration
- 1.10 Restrictions on Working Hours
- 1.11 Notification of Project
- 1.12 Termination of the PSCS Appointment

2 The Existing Environment:

- 2.1 Site Location
- 2.2 Relevant Adjoining Land Uses
- 2.3 Site Restrictions
- 2.4 Restrictions on Access
- 2.5 Hazardous Area Classification
- 2.6 Existing Services
- 2.7 Ground Conditions
- 2.8 Existing Hazards
- 2.9 Liaison with Statutory Bodies

3 Other Work Activities:

- 3.1 Other Contracts Which May Affect Work
- 3.2 Occupation of Site
- 3.3 Building Activities
- 3.4 Other Work Activities
- 3.5 Emergency Procedures in Place on Site

4 Particular and Residual Risks:

- 4.1 Works Which Puts Persons at Work at Risk
- 4.2 Work Which Puts Persons at Risk from Chemical or Biological Substances
- 4.3 Work with Ionising Radiation
- 4.4 Work near High Voltage Power Lines
- 4.5 Work Exposing Persons at Work to the Risk of Drowning
- 4.6 Work on Wells, Underground Earthworks and Tunnels
- 4.7 Work Carried Out by Divers at Work Having a System of Air Supply
- 4.8 Work Carried Out in a Caisson with a Compressed Air Atmosphere
- 4.9 Work Involving the Use of Explosives
- 4.10 Work Involving the Assembly or Dismantling of Heavy Prefabricated Components
- 4.11 Work Involving Hazardous Material
- 4.12 Residual Risks

5 Additional Information:

- 5.1 Existing Documents
- 5.2 Site Possession
- 5.3 Site Rules
- 5.4 Site Specific Safety Objectives
- 5.5 Phasing of Works
- 5.6 Permits/Authorisation Required
- 5.7 Maintenance
- 5.8 Continuing Liaison
- 5.9 Specific Recommendations

6 Information Required for Safety File:

- 6.1 Information Required for Safety File from PSCS

5.2.3 The Management of Health and Safety during the Construction Phase

The selection criteria for the Contractor for the works will be based on the ability to construct the works in a manner that will not endanger the safety, health and welfare of any parties and competence to fulfil the role of PSCS.

The contract will be awarded on the basis of assessment of the candidates against relevant health and safety criteria including experience of similar projects, knowledge of the construction processes involved and training of their management and staff who will be involved in carrying out the works.

5.2.4 The Construction Stage Safety and Health Plan

In accordance with the requirements of the Safety, Health & Welfare at Work (Construction) Regulations 2013, the preliminary Safety & Health Plan prepared by the PSDP will be further developed by the PSCS before the commencement of the construction work and updated on a regular basis during the construction phase of the project.

The document will include the following sections and subsections to ensure the management of health and safety during the construction phase of the project:

1. Description of Project:

- project description and programme details
- details of client, PSDP and PSCS, designers
- contractor and other consultants
- extent and location of existing records and plans
- arrangements for communicating with Contractors, PSDP and others as appropriate.

2. Communication and Management of the Work:

- management structure and responsibilities
- safety and health goals for the project and arrangements for monitoring and review of safety and health performance
- arrangements for:
    - regular liaison between parties on site
    - consultation with the workforce
    - the exchange of design information between the Client, Designers, Project Supervisor for the Design Process, Project Supervisor Construction Stage and Contractors on site
    - handling design changes during the project
    - the selection and control of contractors
    - the exchange of safety and health information between contractors
    - security, site induction, and on-site training
    - welfare facilities and first aid
    - the production and approval of risk assessments and method statements
    - the reporting and investigation of accidents and other incidents (including near misses)
- site rules
- fire and emergency procedures

3. Arrangements for Controlling Significant Site Risks:

- Safety risks
  - services, including temporary electrical installations
  - preventing falls
  - work with or near fragile materials
  - control of lifting operations
  - dealing with services (water, electricity and gas)
  - the maintenance of plant and equipment
  - poor ground conditions
  - traffic routes and segregation of vehicles and pedestrians
  - storage of hazardous materials
  - accommodating adjacent land use
  - other significant safety risks
- Health risks:
  - dealing with contaminated land
  - manual handling
  - use of hazardous substances
  - reducing noise and vibration
  - other significant health risks

The construction stage safety and health plan will be maintained on site by the PSCS and will be communicated to all relevant parties on an ongoing basis through inductions, site safety meetings and tool box talks etc. as required.

5.3 Control of Documents

The Contractor will establish, implement and maintain a procedure to control project documents and records so they are clearly identifiable, organised, current, easily located and revised when necessary.

6. EMERGENCY RESPONSE

6.1 Introduction

This chapter of the CEMP presents an Emergency Response Plan for the proposed development. The Emergency Response Plan shall be finalised in accordance with this outline plan following the appointment of the contractor for the construction works and following detailed design development.

This Emergency Response Plan contains predetermined guidelines and procedures to ensure the safety, health and welfare of everybody involved in the project and to protect the environment during the construction phase of the proposed development. This plan outlines the immediate response to an emergency or disaster situation and will be developed by the construction works contractor and PSCS as part of their construction stage Safety and Health Plan.

An emergency is any disruptive or harmful event that endangers people, environment, property or assets. Emergencies can be small, as in a fire contained by employees using firefighting equipment or large, as in a disaster resulting from a storm.

In the context of the proposed development, examples of Emergency Response Plan emergency events are:

- Medical emergency
- Explosion
- Overheated equipment
- Chemical and fuel spill
- Fire
- Loss of power
- Vehicle incidents.

Example sources of emergency or disaster events are:

- Unstable/inappropriate stockpiles on site
- Faulty or incorrect use of equipment
- Falls from height
- Smoking
- Storm/adverse weather
- Power failure
- Fuel spill
- Road failure
- Serious vehicle collisions or overturning.

6.2 Emergency Response Plan

An emergency response plan deals with the immediate physical effects of a disaster and outlines the initial response.

6.2.1 Emergency Response Liaison

The contractor/PSCS will designate an individual to serve as the Emergency Response Liaison for this project. The emergency response liaison will coordinate the emergency response for the duration of any emergency at or nearby the project site.

Mayo County Council, An Garda Síochána and the HSE Ambulance Co-ordinator will be provided with the construction programme and the onsite contact information from the Emergency Response Liaison prior to construction.

The Emergency Response Liaison will be immediately reachable at all times during project construction. The Liaison will coordinate with the above agencies to establish emergency procedures for access to and within the site in the event of an emergency.

6.2.2 Reporting Emergencies

In the event of fire, storm, flood, serious injury or other emergency, contact:

ALL ON SITE EMERGENCIES DIAL 112 or 999

6.2.3 Designated Responder

A map depicting the location with the emergency meeting point will be furnished to Mayo County Council Fire Department and HSE ambulance co-ordinators.

Upon arrival on the scene, the senior EMS Officer will set up the incident command structure. The Emergency Response Liaison and all contractor's personnel will cooperate with directions of the incident commander and assist as directed.

The nearest emergency services, ambulance and Accident & Emergency (A&E) facilities are:

Service:	Contact Details:	
Accident & Emergency (A&E)	Mayo General Hospital	(094) 902 1733
Ambulance Service	Dial 112 or 999	
Fire Services	Dial 112 or 999	
Garda Station	Claremorris Garda Station	(094) 937 2080

Each member of the contractor's site team who are First-Aid and Cardiopulmonary Resuscitation (CPR) trained personnel will be identifiable with a hard hat sticker indicating their training.

6.2.4 Emergency Alarm

The emergency alarm will be raised on site as soon as an emergency situation is detected, the alarm will be identified (contractor to check those that apply):

Air Horn		**Radio**		**Voice**		**Hand Signals**		**Siren**	

6.2.5 Emergency Reporting

In the event of an emergency, the nearest supervisor with radio equipment/mobile phone will be notified. The degree of emergency will be reported to the Emergency Response Liaison who will contact the Emergency Services and request the appropriate emergency service.

6.2.6 Medical Protocol

In the event of a major medical emergency, the emergency centre (999) will be notified and an ambulance and emergency medical team will respond to the scene. All major medical cases require professional (ambulance) transportation. In the event of a minor medical case, the affected employee can be transported via company vehicle in the escort of a foreman or site engineer (with first aid training).

6.2.7 Emergency Response

Upon notification, the Emergency Response Liaison will respond to the emergency scene and manage emergency operations:

1. Assess hazards and make the area safe – If you cannot enter the area without risking your safety, don't do it, call the Emergency Services immediately and wait for them. If you think you can safely enter the area, look around the emergency scene for anything that can be dangerous or hazardous to you, the casualty, or anyone else at the scene. Bystanders can help with making the area safe. First aid kits will be available on site. Operators that have been first aid/CPR/AED trained will be listed on site and easily identifiable by a hard hat sticker.

2. Take charge of the situation – if you are the first-aid provider on the scene act fast. If someone is already in charge, briefly introduce yourself and see if that person needs any help. If there is any chance the casualty could have a head or spinal injury, tell them not to move.

3. Get Consent – always identify yourself as a first-aid provider and offer to help. Always ask for consent before touching a conscious adult casualty and always ask for consent from a parent or guardian before touching an unconscious or conscious child or infant. With an unconscious adult casualty consent is implied as it is generally accepted that most people want to live. Remember to protect yourself first by wearing gloves and eye protection.

4. Assess Responsiveness – is the casualty conscious or unconscious? Note their response while you are asking them for their consent. If they respond, continue with the primary survey, and if they don't respond, be aware that an unconscious casualty is or has the potential of being a breathing emergency.

5. Call out for help – this will attract bystanders. Help is always useful in an emergency situation. Someone can be called over the phone for medical help. Others can bring blankets if needed, get water, etc. A bystander can help with any of the following:

- Make the area safe.
- Find all the casualties.
- Find the first aid kit, or any useful medical supplies.
- Control the crowd.
- Call for medical help.
- Help give first aid, under your direction.
- Gather and protect the casualty's belongings.
- Take notes, gather information, be a witness.
- Reassure the casualty's relatives.
- Lead the ambulance attendants to the scene of the emergency.
- Notify Emergency Services as soon as you can. Either send a bystander or call yourself.

In the event of a major medical emergency, the Emergency Response Liaison, as the person-in-charge of the emergency scene, will dispatch someone to the site access point nearest the emergency scene to direct and lead arriving outside responders to the emergency scene. The designated meeting point will be agreed prior to the commencement of construction. Emergency personnel will be met at this meeting point which has been communicated by management during the 999 call. The emergency personnel escort will use the hazard lights on their vehicle so they are easily identified.

6.2.8 Escape and Evacuation Procedure

Dependent upon the degree of the emergency and if safe to do so, employees will evacuate to the designated assembly area where the designated wardens shall account for all employees and determine if anyone still remains within the emergency scene.

Should a wild land fire or peat slippage occur, and the designated assembly area is compromised, other locations will be designated as secondary assembly areas.

6.2.9 Prevention of Illness/Injury due to Weather/Elements

1. All employees will have access to shelter and heat in the event of inclement weather.
2. Employees will have access to at least a litre of water at all times.
3. Weather forecast will be discussed every morning with the crews. Weather conditions and forecast will be monitored regularly by management.
4. No Employee will work alone. A buddy system will be used so employees can contact a supervisor in case of an emergency.

6.2.10 Environmental Emergency Procedure

An emergency preparedness and response procedure is required to prevent environmental pollution incidents. Emergency Silt Control and Spillage Response Procedures are included in Section 4.4.5 of this CEMP.

Suitable spill kits and absorbent material for dealing with oil spills will be maintained on site. In the event of pollution or potential risk of pollution, the Local Authority should be informed immediately.

6.2.11 Emergency Response Plan – Haul Routes

Emergency Response Procedure relating to transportation of plant, equipment and materials to the site will be developed by the contractor during the construction phase of the development.

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 1

Certificate of Authorisation
(Licence number: H0319-01)

Headquarters
P.O. Box 3000
Johnstown Castle Estate
County Wexford
Ireland

Closed Landfill
Certificate of Authorisation

Certificate of Authorisation Number:	H0319-01
Certification of Authorisation Holder:	Mayo County Council
Location of Facility:	Claremorris Historic Landfill Kilbeg Claremorris County Mayo

HEADQUARTERS
JOHNSTOWN CASTLE ESTATE
COUNTY WEXFORD, IRELAND
PHONE: +353-53-9160600
FAX: +353-53-9160699

WASTE MANAGEMENT (CERTIFICATION OF HISTORIC UNLICENSED WASTE DISPOSAL AND RECOVERY ACTIVITY) REGULATIONS 2008

HISTORIC LANDFILL

CERTIFICATE OF AUTHORISATION

Decision of Agency, under Regulation 7(6) of the Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008

Reference Number: H0319-01

In pursuance of the powers conferred on it by the Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008, the Environmental Protection Agency (the Agency) grants, under Regulation 7(6) of the said Regulations, this Certificate of Authorisation to Mayo County Council, Áras an Chontae, Castlebar, County Mayo, in respect of the closed landfill at Kilbeg, Claremorris, County Mayo, subject to conditions set out in the Certificate of Authorisation.

A copy of the Decision is attached.

Sealed by the Seal of the Agency on this the 19th day of August 2021

PRESENT when the seal of the Agency was affixed hereto:

Tara Gillen

Tara Gillen, Authorised Person

Glossary of Terms

All terms in this Certificate of Authorisation should be interpreted in accordance with the definitions in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008 (S.I. No. 524 of 2008) unless otherwise defined in the Certificate of Authorisation.

Agency	Environmental Protection Agency.
Agreement	Agreement in writing.
Annually	At approximately twelve-monthly intervals.
Application	The application by the local authority for this Certificate of Authorisation including the risk assessment, any amendments to the risk assessment, additional information received from the local authority and other documents provided by the local authority.
Certificate of Authorisation	Includes this document and the application.
Closed Landfill	As defined in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008.
Code of Practice	As defined in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008.
Biannually	All or part of a period of six consecutive months.
Documentation	Any report, record, results, data, drawing, proposal, interpretation or other document in written or electronic form which is required by this Certificate of Authorisation.
Drawing	Any reference to a drawing or drawing number means a drawing or drawing number contained in the application, unless otherwise specified in this Certificate of Authorisation.
Environmental Pollution	As defined in the Waste Management Act 1996 as amended.
Heavy Metals	This term is to be interpreted as set out in "Parameters of Water Quality, Interpretation and Standards" published by the Agency in 2001. ISBN 1-84095-015-3.

Incident	The following shall constitute an incident for the purposes of this Certificate of Authorisation: (i) an emergency; (ii) any emission which does not comply with the requirements of this Certificate of Authorisation; (iii) any trigger level specified in this Certificate of Authorisation which is attained or exceeded; and (iv) any indication that environmental pollution has, or may have, taken place.
Inert Waste	Waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater.
Maintain	Keep in a fit state, including such regular inspection, servicing, calibration and repair as may be necessary to perform its function adequately.
Necessary Measures	As defined in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008.
Relevant Heavy Metals	Heavy metals for analysis shall include, as a minimum, those metals identified as relevant, having regard to the risk assessment and surface water and groundwater monitoring results as required by this Certificate of Authorisation.
Risk Assessment	As defined in the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008.
Sample	Unless the context of this document indicates to the contrary, the term sample or samples shall include measurements taken by electronic instruments.
Status	As defined in the Water Framework Directive, in relation to surface water and groundwater.
The Local Authority	Mayo County Council, Áras an Chontae, Castlebar, County Mayo.
Trigger Level	A parameter value the achievement or exceedance of which requires certain actions to be taken by the local authority.

Part I Authorisation of a Closed Landfill

The Environmental Protection Agency (the Agency) grants, under Regulation 7(6) of the Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008 (the Regulations), this Certificate of Authorisation to Mayo County Council, Áras an Chontae, Castlebar, County Mayo, in respect of the closed landfill at Kilbeg, Claremorris, County Mayo, subject to Conditions set out in Part II and the Reasons for the Decision in Part III.

Part II Conditions

Condition 1. Scope

1.1 For the purposes of this Certificate of Authorisation, the closed landfill authorised by this Certificate of Authorisation is the area of land outlined in red on Drawing No. P2348-0400-0002_Rev.B (drawing dated 03.03.20) submitted with the application. Any reference in this Certificate of Authorisation to "closed landfill" shall mean the area thus outlined in red.

1.2 No waste shall be accepted at the closed landfill.

1.3 No waste shall be burned at the closed landfill.

1.4 The facility shall be controlled, operated and maintained, and emissions shall take place as authorised by this Certificate of Authorisation. No material change that will result in an increase in the actual or potential nature or quantity of any emission shall be carried out or commenced without the agreement of the Agency.

1.5 Nothing in this Certificate of Authorisation shall prohibit authorised beneficial uses of the site of the closed landfill provided that such uses do not interfere with the integrity of the remediation measures adopted.

Reason:	*To clarify the scope of this Certificate of Authorisation.*

Condition 2. Notifications, Records and Reports

2.1 The local authority shall notify the Agency, in a format as may be specified by the Agency, two months in advance of the intended date of commencement of the remediation works.

2.2 The local authority shall notify the Agency as soon as practicable after the occurrence of any incident. The incident notification shall be provided in a format as may be specified in relevant guidance issued by the Agency.

2.3 The local authority shall keep the following documents available for inspection by the Agency at all reasonable times and to members of the public by request:

(a) Records of all sampling, analyses, measurements, examinations, calibrations and maintenance;

(b) Records of incidents;

(c) Records of all complaints of an environmental nature;

(d) The validation report prepared on completion of the remediation; and

(e) Other documentation required by this Certificate of Authorisation or as may be otherwise directed by the Agency.

2.4 The local authority shall assign the necessary resources, including financial, to complete the remediation measures specified in this Certificate of Authorisation and risk assessment and to respond to any incident.

2.5 The local authority shall annually pay to the Agency €1,083, or such sum as the Agency from time to time determines in accordance with charges policy, for the performance of its functions under the Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008 in relation to the closed landfill regulated by this Certificate of Authorisation.

Reason: *To provide for the collection and reporting of adequate information on the activity. To provide for adequate resources for monitoring and measures to protect the environment.*

Condition 3. Management and Monitoring

3.1 The local authority shall implement the following measures within 18 months of the date of grant of this Certificate of Authorisation, or as otherwise specified or agreed by the Agency:

(a) Minimise the disturbance of deposited waste to the extent possible;

(b) Remove, for disposal or recovery at an appropriate facility, the waste from the surface of the landfill within three months of the date of grant of this Certificate of Authorisation;

(c) Carry out repairs to the monitoring borehole BH02;

(d) Install a low permeability landfill cap over the entire waste body, minimum 1m, with 1mm thick low permeability geomembrane having a hydraulic conductivity of less than or equal to $1x10^{-9}$m/s;

(e) Install a gas management system in the waste body, within six months of the date of grant of this Certificate of Authorisation.

The gas management system shall include the following elements:

(i) Gas vent pipes with fans or cowls, as appropriate;

(ii) The gas vent pipes shall not be perforated above the ground level; and

(iii) Spacing between the gas vent pipes shall be in accordance with EPA Landfill Manuals – Landfill Site Design.

On agreement by the Agency, the gas vent pipes and associated infrastructure may be removed or altered in accordance with any recommendations arising from the trial in accordance with Condition 3.1(i).

(f) Install three additional combined landfill gas/groundwater monitoring boreholes outside the waste body (boreholes BH03, BH04 and BH05);

(g) Install one additional groundwater monitoring borehole (borehole BH06) downgradient of the waste body;

(h) Install two additional leachate monitoring boreholes within the waste body (monitoring boreholes LW01 and LW02);

(i) The local authority shall, within twelve months of the date of grant of this Certificate of Authorisation, following gas monitoring, as required under Condition 3.9(d), seek agreement of the Agency regarding whether to carry out a gas pumping trial for the purpose of determining the quantity and quality of landfill gas;

(j) The local authority shall implement any recommendations arising from the gas pumping trial, subject to the agreement by the Agency; and

(k) Reseed grass within the site.

3.2 Site Notice Board

(a) The local authority shall, within one month of the date of grant of this Certificate of Authorisation and for the duration of the remediation works, provide a Site Notice Board on the closed landfill site so that it is legible to persons outside the main entrance to the closed landfill site. The minimum dimensions of the board shall be 1200 mm by 750 mm.

(b) The board shall clearly show:

(i) The name of the Certificate of Authorisation holder;

(ii) The name of the closed landfill site;

(iii) The Certificate of Authorisation reference number;

(iv) The contact telephone in relation to the closed landfill site; and

(v) Where information relating to the closed landfill site can be obtained.

3.3 The local authority shall manage the closed landfill to ensure that discharges and emissions from the closed landfill do not cause environmental pollution or deterioration in the status of the receiving surface water body or groundwater body.

3.4 The integrity of the landfill cap shall be maintained at all times and shall not be compromised by the installation of any future developments.

3.5 The local authority shall compile a validation report in accordance with the requirements of the Code of Practice. Unless otherwise agreed, the validation report shall be submitted to the Agency within 30 months of the date of grant of this Certificate of Authorisation.

3.6 The local authority shall assess the results of all monitoring carried out to confirm whether the closed landfill continues to achieve the objectives set for it in the risk assessment or this Certificate of Authorisation.

3.7 The local authority shall submit to the Agency, by the 31st March of each year, an annual update covering the previous calendar year. This update, which shall be to the satisfaction of the Agency, shall include as a minimum the information specified in Condition 3.9 of this Certificate of Authorisation.

3.8 The local authority shall, within 24 months of the date of grant of this Certificate of Authorisation, submit a drawing showing the following elements interpolated:

(i) Extent of the waste body and the area capped, as required under Condition 3.1(d);

(ii) The locations of the gas vents, as required under Condition 3.1(e) and any gas infrastructure as may be required following the gas pumping trial; and

(iii) All monitoring points for landfill gas, leachate, groundwater and surface water.

3.9 The local authority shall annually, or as otherwise prescribed by the Agency, conduct and record:

(a) A visual inspection of the landfill to ensure that the condition of the site has not deteriorated;

(b) Monitoring for leachate (sample, analyse, characterise, and measure the level of leachate) on a quarterly basis in the existing leachate monitoring borehole BH01 and the two additional monitoring boreholes required under Condition 3.1(h). The monitoring shall, as a minimum, include the following parameters: Biochemical Oxygen Demand (BOD) (mg O_2/l), Total Ammonia (mg N/l), Ammonium (µg/l N), Molybdate Reactive Phosphorus (MRP) (µg P/l), Electrical Conductivity (µS/cm), Potassium (µg/l), Iron (µg/l), Manganese (µg/l), Zinc (µg/l) and other relevant Heavy Metals.

(c) A screening of leachate for trace organic substances in accordance with the EPA Landfill Manuals – Landfill Monitoring and any subsequent amendments.

(d) Monitoring, on a quarterly basis, to detect the presence and concentration of landfill gas in:

(i) The existing monitoring boreholes BH01 & BH02; and

(ii) The three monitoring boreholes required under Condition 3.1(f).

The local authority shall have regard to the Agency's Air Guidance (AG) Notes and Landfill Manual – Landfill Monitoring, 2nd Edition, 2003, and any subsequent amendments, when carrying out gas monitoring;

(e) Monitoring (sample, analyse and characterise) on a quarterly basis at the following locations:

(i) The adjacent drain upstream of the closed landfill (monitoring locations SW1, SW2 and SW3);

(ii) The Kilbeg-Malone River upstream of the closed landfill (monitoring location SW4);

(iii) The Kilbeg-Malone River downstream of the closed landfill (monitoring locations SW5 and SW6); and

(iv) The Listduff River south-east of the closed landfill (monitoring location SW7).

The monitoring shall, as a minimum, include Biochemical Oxygen Demand (BOD) (mg O_2/l), Total Ammonia (mg N/l), Molybdate Reactive Phosphorus (MRP) (mg P/l) and other relevant parameters listed in European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended.

(f) Monitoring (sample, analyse and characterise) on a quarterly basis of groundwater from the groundwater monitoring borehole BH02, the three additional combined boreholes required under Condition 3.1(f) and one additional borehole required under Condition 3.1(g). The monitoring shall, as a minimum, include the following parameters: Ammonium (µg/l N), Molybdate Reactive Phosphorus (MRP) (µg P/l), Electrical Conductivity (µS/cm), Potassium (µg/l), Iron (µg/l), Manganese (µg/l), Zinc (µg/l) and other relevant Heavy Metals and other relevant parameters listed in European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended, and EPA Interim Guideline Values (IGV).

(g) The sensitivity of the monitoring methods utilised for monitoring under Condition 3.9 shall have an appropriate limit of detection to allow for comparison of pollutant concentrations against the relevant trigger levels and/or standard reference values as set out in Condition 3.9(h).

(h) The assessment and reporting of monitoring results against trigger levels and/or standard reference values for relevant pollutants including environmental quality standards in the European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended, European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended, EPA Interim Guideline Values (IGV) and the Agency Landfill Manuals - Landfill Monitoring, 2nd Edition, 2003, and any subsequent revisions.

3.10 The location, frequency, methods and scope of surveys, monitoring, visual inspections, sampling and analyses, as set out in this Certificate of Authorisation, may be amended with the agreement of the Agency following evaluation of test results.

3.11 Soil and stone

3.11.1 Soil and stone imported for use in remedial, corrective or other engineering works at the closed landfill shall be greenfield soil and stone or soil and stone of equivalent nature and character in terms of chemical and physical contamination.

3.11.2 Documented acceptance, storage/stockpiling and utilisation procedures shall be operational in advance of receipt of such materials. Records shall be maintained showing the site of origin of the soil and stone and its nature.

3.12 No emissions, including odours and noise, from works carried on at the site shall result in an impairment of, or an interference with amenities or the environment beyond the facility boundary or any other legitimate uses of the environment beyond the facility boundary.

3.13 The local authority shall ensure, at all times after the grant of this Certificate of Authorisation, that all infrastructure cap and all equipment required under this Certificate of Authorisation has been and is:

(i) installed;
(ii) commissioned;
(iii) present on site, and
(iv) maintained in full working order.

3.14 The local authority shall ensure that the closed landfill does not result in an impairment of, or an interference with, amenities or the environment at the facility or beyond the facility boundary (including those arising from emissions (including odours, noise, dust, litter and mud), vermin and birds).

3.15 Wells and boreholes

3.15.1 Groundwater monitoring wells shall be constructed having regard to the guidance given in the Agency's landfill manual "Landfill Monitoring".

3.15.2 All wellheads shall be adequately protected to prevent contamination or physical damage.

3.15.3 All wells and boreholes shall be adequately sealed to prevent surface contamination and, as may be appropriate, decommissioned according to the UK Environment Agency guidelines "Decommissioning Redundant Boreholes and Wells", unless otherwise agreed by the Agency.

3.16 The local authority shall clearly label and provide safe and permanent access to all on-site sampling and monitoring points and to off-site points as required by the risk assessment or this Certificate of Authorisation. The requirement with regard to off-site points is subject to the prior agreement of the landowners concerned.

3.17 Incidents

In the event of an incident the local authority shall immediately:

(a) If necessary, contact the emergency services;

(b) Carry out an investigation to identify the nature, source and cause of the incident and any emission arising therefrom;

(c) Isolate the source of any such emission;

(d) Evaluate the environmental pollution, if any, caused by the incident;

(e) Identify and execute measures to minimise the emissions/malfunction and the effects thereof;

(f) Identify the date, time and place of the incident; and

(g) Notify the Agency (in accordance with Condition 2.2) and all other relevant authorities including, where relevant, the Water Services Authority and Inland Fisheries Ireland.

3.18 Invasive Species Prevention and Eradication Plan

The Certificate of Authorisation holder shall establish, maintain and implement an invasive species prevention and eradication plan, to cover at least, Japanese Knotweed, Giant Knotweed, Bohemian Knotweed and any other relevant invasive species. The plan shall as a minimum identify specific actions for:

(a) The prevention, to the extent possible, of acceptance of invasive species in loads of soil and stone or of topsoil arriving at the facility, actions to include requesting of information on the presence and management of invasive species at source sites;

(b) Quarterly surveys of the facility for the detection of the growth of invasive species during remediation and during the implementation of the invasive species prevention and eradication plan, moving to annual surveys following validation in accordance with Condition 3.18(f);

(c) The method for plant detection and identification;

(d) The remedial actions for eradication of invasive species growing at the facility;

(e) Staff training on plant identification and eradication; and

(f) Validation to confirm the absence of invasive species at the restored facility.

The Certificate of Authorisation holder shall maintain evidence of having obtained the advice and implemented the recommendations of an independent and appropriately qualified consultant, in the establishment of the Plan and any amendments to it that concern the action items listed above.

3.19 Communications Programme

3.19.1 The Certificate of Authorisation holder shall establish, maintain and implement a Communications Programme to ensure that members of the public can obtain information from the local authority concerning the closed landfill.

3.19.2 The Communications Programme shall inform members of the public what they can and should do to protect their property and health.

3.19.3 The local authority shall, as part of the Communications Programme, publish landfill gas, landfill leachate, groundwater and surface water monitoring data biannually in a manner accessible by the public.

Reason:	*To make provision for the proper closure of the activity ensuring protection of the environment.*

Part III: Schedules

Schedule 1: Reasons for the Decision

In granting this Certificate of Authorisation, the Agency determines that the risk assessment submitted by the local authority as part of the application for a Certificate of Authorisation is adequate. To ensure appropriate protection for human health and the environment and to ensure conformity with the provisions of Council Directive 2008/98/EC and Council Directive 2006/118/EC, the conditions set out in Part II of this Certificate of Authorisation are specified as further necessary measures in addition to those identified by the risk assessment.

The Agency also considers that the activity will not adversely affect the integrity of any European Site and has decided to impose conditions for the purposes of ensuring it does not do so. It has determined that the activity, if managed, operated and controlled in accordance with the Certificate of Authorisation, will not have any adverse effect on the integrity of any of those sites.

A screening for Appropriate Assessment was undertaken to assess, in view of best scientific knowledge and the conservation objectives of the site, if the activity, individually or in combination with other plans or projects is likely to have a significant effect on any European Site. In this context, particular attention was paid to the European Sites at Lough Carra/Mask Complex SAC (site code: 001774), Lough Mask SPA (site code: 004062), Lough Carra SPA (site code: 004051), Carrowkeel Turlough SAC (site code: 000475), River Moy SAC (site code: 002298), Lough Corrib SAC (site code: 000297), Lough Corrib SPA (site code: 0004042), Kilglassan/Caheravoostia Turlough Complex SAC (site code: 000504), Balla Turlough SAC (site code: 000463), Greaghans Turlough SAC (site code: 000503), Towerhill House SAC (site code: 002179), Ardkill Turlough SAC (site code: 000461) and Ballinafad SAC (site code: 002081).

The activity is not directly connected with or necessary to the management of any European Site and the Agency considered, for the reasons set out below, that it cannot be excluded, on the basis of objective information, that the activity, individually or in combination with other plans or projects, will have a significant effect on any European Site and accordingly determined that an Appropriate Assessment of the activity was required.

The reason for this determination is as follows:

- There is a hydrological connection between the closed landfill and Carra/Mask Complex SAC (site code: 001774) and Lough Mask SPA (site code: 004062) and, despite the fact that these European Sites are located approximately 45km downstream of the site, it cannot be excluded, based on the submitted monitoring results for surface water and groundwater, that the closed landfill will have no effect on these European Sites.
- There is no hydrological connection between the closed landfill and the rest of the European Sites.

The Agency has completed the Appropriate Assessment of potential impacts on these sites and has made certain, based on best scientific knowledge in the field and in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 as amended, pursuant to Article 6(3) of the Habitats Directive, that the activity, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site, in particular Lough Carra/Mask Complex SAC (site code: 001774), Lough Mask SPA (site code: 004062), Lough Carra SPA (site code: 004051), Carrowkeel Turlough SAC (site code: 000475), River Moy SAC (site code: 002298), Lough Corrib SAC (site code: 000297), Lough Corrib SPA (site code: 0004042), Kilglassan/Caheravoostia Turlough Complex SAC (site code: 000504), Balla Turlough SAC (site code: 000463), Greaghans Turlough SAC (site code: 000503), Towerhill House SAC (site code: 002179), Ardkill Turlough SAC (site code: 000461) and Ballinafad SAC (site code: 002081), having regard to their conservation objectives and will not affect the preservation of these sites at favourable conservation status if carried out in accordance with this Certificate of Authorisation and the conditions attached hereto for the following reasons:

- specifically, the remedial works will be undertaken to minimise the potential for water pollution in the Lough Carra/Mask Complex SAC (site code: 001774) and Lough Mask SPA (site code: 004062) and will ensure that there will be no significant impact on these European Sites;
- the project alone, which consists of the remediation of the closed landfill, or in-combination with other projects, will not adversely affect the integrity and conservation status of any of the qualifying interests of the Lough Carra/Mask Complex SAC (site code: 001774) and Lough Mask SPA (site code: 004062); and
- there is no hydrological connection between the closed landfill and Lough Carra SPA (site code: 004051), Carrowkeel Turlough SAC (site code: 000475), River Moy SAC (site code: 002298), Lough Corrib SAC (site code: 000297), Lough Corrib SPA (site code: 0004042), Kilglassan/Caheravoostia Turlough Complex SAC (site code: 000504), Balla Turlough SAC (site code: 000463), Greaghans Turlough SAC (site code: 000503), Towerhill House SAC (site code: 002179), Ardkill Turlough SAC (site code: 000461) and Ballinafad SAC (site code: 002081).

The Agency is satisfied that no reasonable scientific doubt remains as to the absence of adverse effects on the integrity of those European Sites: Lough Carra/Mask Complex SAC (site code: 001774), Lough Mask SPA (site code: 004062), Lough Carra SPA (site code: 004051), Carrowkeel Turlough SAC (site code: 000475), River Moy SAC (site code: 002298), Lough Corrib SAC (site code: 000297), Lough Corrib SPA (site code: 0004042), Kilglassan/Caheravoostia Turlough Complex SAC (site code: 000504), Balla Turlough SAC (site code: 000463), Greaghans Turlough SAC (site code: 000503), Towerhill House SAC (site code: 002179), Ardkill Turlough SAC (site code: 000461) and Ballinafad SAC (site code: 002081).

No representation having been received to the proposed Certificate of Authorisation, the Certificate of Authorisation is granted in accordance with the terms of the proposed Certificate of Authorisation and the reasons therefor.

Part IV: SIGNATURE

Sealed by the seal of the Agency on this the 19th day of August 2021.

PRESENT when the seal of the Agency
was affixed hereto:

Tara Gillen, Authorised Person

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 2

Invasive Species Management Plan

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

CLAREMORRIS CLOSED LANDFILL REMEDIATION PROJECT

INVASIVE SPECIES MANAGEMENT PLAN

Prepared for: Mayo County Council

Comhairle Contae Mhaigh Eo
Mayo County Council

Date: **May 2022**

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INVASIVE SPECIES MANAGEMENT PLAN

REVISION CONTROL TABLE, CLIENT, KEYWORDS AND ABSTRACT
User is responsible for Checking the Revision Status of This Document

Rev. No.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
0	For Issue	KM/MG/AMW	JON/RM/RD	BG	18/05/2022

Client: Mayo County Council

Keywords: Invasive species, Claremorris Closed Landfill, Management

Abstract: This document provides an Invasive Species Management Plan to provide guidance and strategies for the management of invasive plant species located at the Claremorris Closed Landfill.

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1. INTRODUCTION

Mayo County Council has commissioned Fehily Timoney & Company (FT) to prepare an Invasive Species Management Plan as part of the proposed remediation plan for Claremorris Closed Landfill. This plan has been prepared to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 (not to cause the spread of non-native invasive plant species listed in schedule III), and to ensure non-native invasive plant species not listed in schedule III are not spread to adjacent land or Natura 2000 (European) sites. The report details a programme for the mapping and control of invasive species at the remediation site within the closed historic landfill site.

Japanese knotweed was treated on site with herbicide by contractors employed by Mayo County Council in September 2014 and 2015. The Japanese Knotweed Company (JKC) on behalf of Mayo County Council - Claremorris & Western District Energy Co-op carried out additional inspections in August 2018 and 2019, and Japanese knotweed was still persisting on site. A recent ecological walkover covering the habitat at the closed landfill was conducted in November 2021. This walkover identified Japanese knotweed, in addition to winter heliotrope and cherry laurel within the site boundary. Japanese knotweed is a high impact invasive species according to the National Biodiversity Data Centre, on a scale based on risk analysis according to Kelly et al., 2013.

This document provides background information on the non-native invasive species present and mapping of their location and extent within the footprint of the remediation site. It provides sources of information including policy and guidelines to which cognisance has been paid, and the means of managing and controlling the species from site safely using prevention, containment, treatment, monitoring, follow up treatment, record keeping and appropriate disposal.

1.1 Legislative Context

In Ireland, the spread and propagation of species listed in the Third Schedule of S.I. No. 477/2011 European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 is an offence. Under Regulation 49 (2) - save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to such plant in the third column of Part 1 of the Third Schedule, any plant which is included in Part 1 of the Third Schedule, shall be guilty of an offence. Under Regulation 50 it is an offence to transport a vector material listed in Part 3 of the Third Schedule except under licence (Regulation 50 is not yet in effect).

In October 2017, Ireland's 3rd National Biodiversity Action Plan (NPWS, 2017), for the period 2017-2021 was launched. This Plan sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland's 'Vision for Biodiversity' and follows on from the work of the first and second National Biodiversity Action Plans. Target 4.4 states that '*Harmful invasive alien species are controlled and there is reduced risk of introduction and/or spread of new species*.'

This is supported by seven actions, those relevant to this management plan are:

- *4.4.3. Continue and enhance measures for eradication, where feasible, control and containment of invasive species*
- *4.4.4. Encourage horticultural nurseries to produce native species, varieties and landraces from appropriate native sources for public and private sector plantings. Public bodies will endeavour to plant native species in order to reduce importation of non-native species, varieties and landraces.*
- *4.4.6. Publish legislation to address required provisions under the EU Regulation on invasive alien species (No. 1143/2014) and on responsibilities and powers regarding invasive alien species, giving IFI responsibility for aquatic invasive species.*

The Draft Mayo County Development Plan includes an Invasive Species Policy, which aims to "*support measures for the prevention and/or eradication of invasive species as appropriate within the county".* The plan also outlines an Invasive Species Objective, which ensures "*that where the presence of invasive species is identified at the site of any proposed development or where the proposed activity has an elevated risk of resulting in the presence of these species, details of how these species will be appropriately managed and controlled will be required".*

1.2 Site Description

Claremorris closed landfill is located in the townland of Clare, Claremorris, Co. Mayo. The site is approximately 800m south-east of Claremorris town. The closed landfill capping area footprint is 3.8ha and is located within a larger application site consisting of open land which has an area of 5.6ha. The site is currently vacant and in an overgrown state. Neighbouring land uses include agricultural grassland, cutaway bogland, commercial forestry and residential properties located approximately 280m to the west of the site. An electrical substation is also located approximately 150m to the north of the site. The site is bound by the Dublin-Westport Railway line to the north, the Knock-Claremorris Bypass (N17) to the West, commercial forestry to the south and agricultural land (boggy ground) occupies the remaining land to the east of site.

The site operated as a landfill accepting municipal waste from 1982 to March 1996. The site was capped with boulder clay, but no remediation works have been completed.

Waste deposited at the site is understood to comprise of municipal and commercial wastes to depths of 6.5m below ground level (BGL). The interpreted landfill extent covers an area of 32,000 m^2 and initial calculations estimate an interred waste volume of approximately 168,000 – 297,623m^3 at the site.

The western portion of the site (raised area) is inhabited by rough grassland and scrub. The eastern half of the site forms part of an area of harvested, drained peatland.

The site generally falls from south to north towards the railway and west to east towards the harvested and drained peatland. The KILBEG-MALONE (EPA code: 30K3711), a 1st order stream crosses the eastern portion of the site travelling in a southern direction. After flowing for 44km, this stream ultimately enters Lough Mask via the LISDUFF 30 (EPA code: 30L4313) and Robe River (EPA code: 30R0115).

The site currently:

- Has a shallow soil cap with an established grass and shrub cover.
- Is drained by a watercourse along the western and northern boundary of the site which ultimately discharge to the Kilbeg-Malone River.
- Is secured by stock proof fencing along the western boundary of the site.

The location of the site is shown in Figure 1.1.

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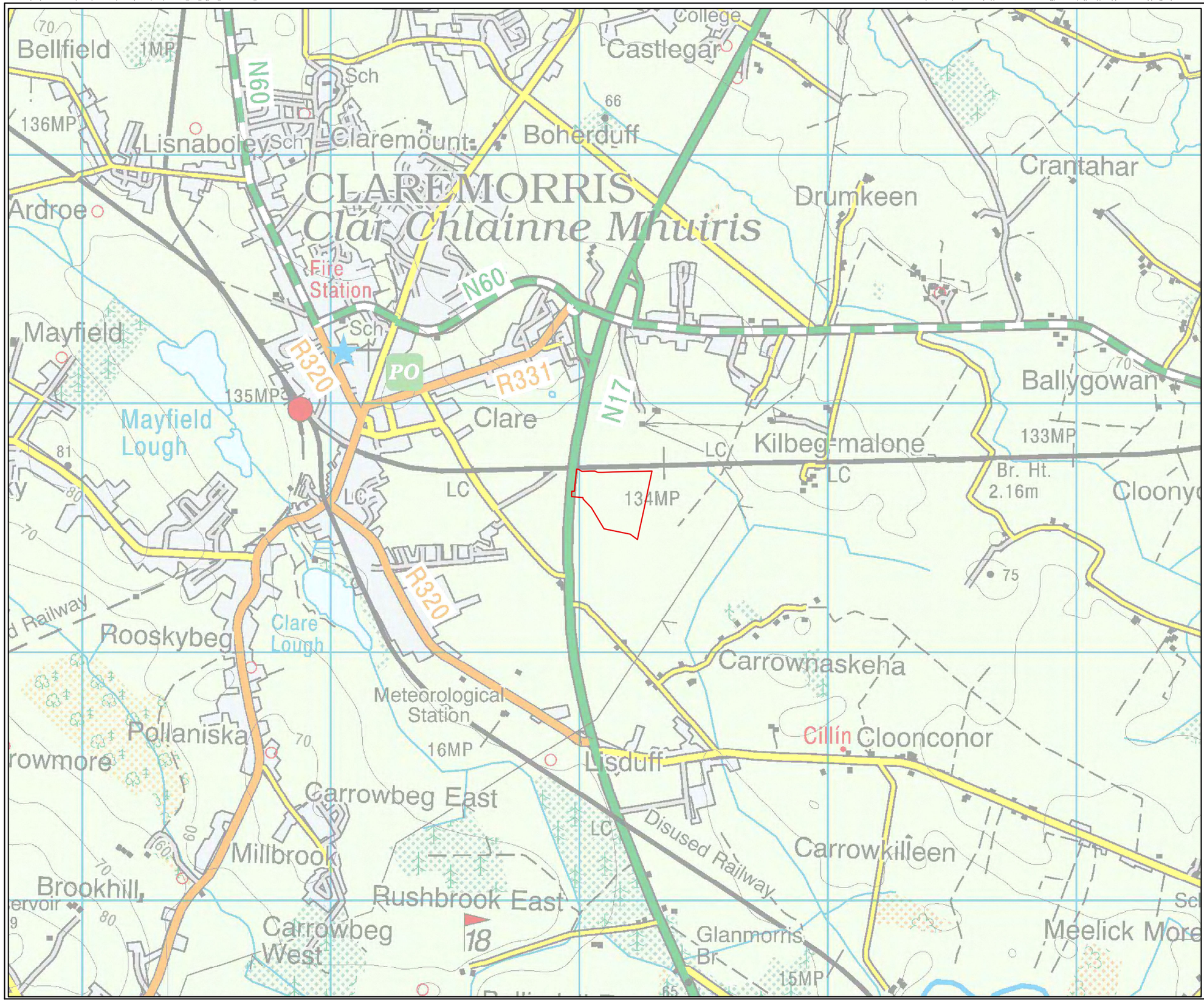

TITLE:	Site Location		
PROJECT:	Claremorris Historic Landfill		
FIGURE NO:	1.1		
CLIENT:	Mayo County Council		
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DATE:	06/05/2022	**PAGE SIZE:**	A3

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2. METHODOLOGY

2.1 Relevant Guidance

The methodology and guidance for this management plan has been devised in consideration of the following relevant guidance:

- NRA, (2010) Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. Revision 1, December 2010. National Roads Authority.
- Property Care Association, (2018). Practical Management of Invasive Non-Native Weeds in Britain and Ireland. Packard Publishing Ltd.
- Kelly et al., (2008). Best Practice Management Guidelines Japanese Knotweed *Fallopia japonica*. Prepared for NIEA and NPWS as part of Invasive Species Ireland.
- Tu, (2009) Assessing and Managing Species within Protected Areas. Protected Area Quick Guide Series. Editor J., Ervin, Arlington, VA. The Nature Conservancy, 40 pp.
- Stokes et al., (2004). Invasive Species in Ireland. Unpublished report to Environment and Heritage Service and National Parks and Wildlife Service. Quercus, Queens University Belfast, Belfast.
- AM-SOP-009 Information and Guidance Document on Japanese Knotweed
- RAPID, 2018. Good Practice Management- Japanese Knotweed (*Fallopia japonica*).
- INNSA, 2017. Code of Practice – Managing Japanese Knotweed
- Irish Water, 2022. AM-SOP-009 Information and Guidance Document on Japanese Knotweed
- Irish Water, 2022. IW-AMT-GL-001 Irish Water Guidance on the Management of Giant Hogweed
- Irish Water, 2022. IW-AMT-GL-002 Irish Water Guidance on the Management of Himalayan Balsam
- Irish Water, 2022. IW-AMT-GL-007 Irish Water Guidance on Biosecurity for Aquatic Sampling Activities
- Irish Water, 2022. IW-OPM-SOP-10 Biosecurity Standard Operating Procedure for Aquatic Sampling

2.2 Desktop Study

A desktop study was carried out to identify existing records of invasive flora species at the remediation site within the Claremorris Closed Landfill and habitat suitability of the adjacent area for the invasive species. This study allows the surveyor to narrow down the source of the species introduction and its likelihood of spreading. The following open sources of information were consulted:

- Invasive Species Ireland website (Invasive Species Ireland, 2022)
- Invasive Alien Species in Ireland website (Invasives.ie, 2022)
- OSI Aerial photography and 1:50000 mapping
- National Parks and Wildlife Service (NPWS) web mapping (NPWS, 2022)
- National Biodiversity Data Centre (NBDC) web mapping (National Biodiversity Data Centre, 2022)
- Environmental Protection Agency (EPA) web mapping (EPA, 2022)
- Botanical Society of Britain and Ireland Mapping (BSBI, 2022).

2.3 Mapping

The habitats at the Claremorris Closed Landfill were identified and classified, according to '*A Guide to Habitats in Ireland*' (Fossitt, 2000) during walkover survey undertaken by Fehily Timoney ecologist Kate Mahony in November 2021. During this survey, invasive non-native flora species were identified and mapped.

3. EXISTING ENVIRONMENT

3.1 Desktop Records

Historical records of invasive species plants from the relevant national datasets were assessed through the National Biodiversity Data Centre (08/03/2022). No records of invasive species were available within the 2km grid square the remediation site is located (M37M). However, Japanese knotweed is present in the square according to BSBI (2022). Table 3-1 summarises the invasive flora recorded within the 10km (M37) grid square surrounding the closed landfill:

Table 3-1: Invasive flora species within the M37 Grid Square

Common Name	Scientific Name	Impact*	Year of Last record
Canadian Waterweed	*Elodea canadiensis*	High	2006
Hybrid knotweed	*Fallopia japonica* x *sachalinensis* =*F.* x *bohemica*	High	2015
Japanese knotweed	*Fallopia japonica*	High	2016
Sycamore	*Acer pseudoplatanus*	Medium	2015

*Impact classified according to Invasives.ie, 2022

3.2 Results of Field Survey

The following habitats were recorded on site include wet grassland (GS4), wet heath/cutover bog (HH3/PB4), conifer plantation (WD4), drainage ditched (FW4) and wet willow-alder-ash woodland (WN6).

During field surveys in November 2021, the following invasive species were recorded within the footprint of the remediation site:

- Japanese knotweed (*Fallopia japonica*)
- Winter heliotrope (*Petasites fragrans*)
- Cherry laurel (*Prunus laurocerasus*)

The extent of these species is detailed in Figure 3.1.

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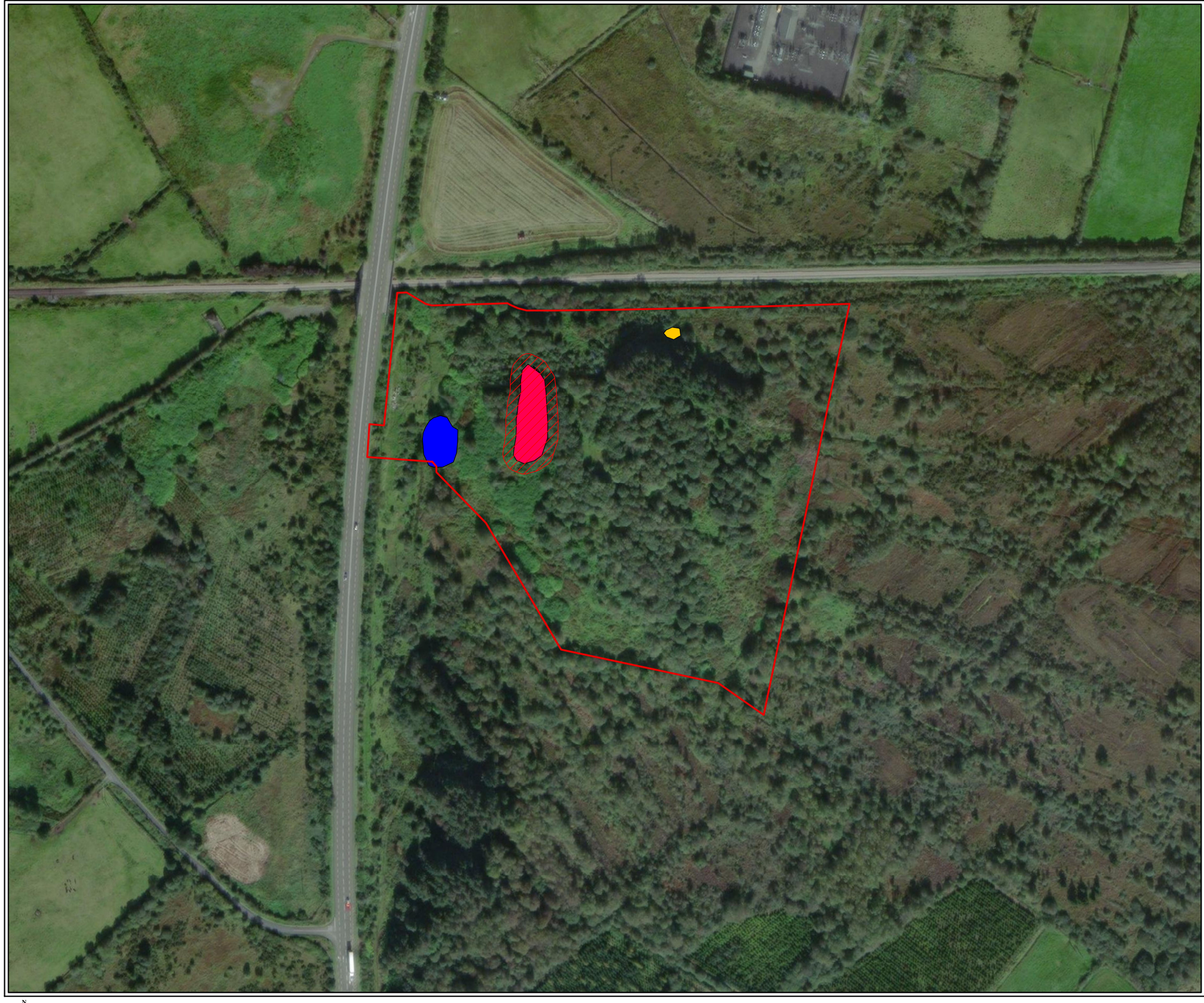

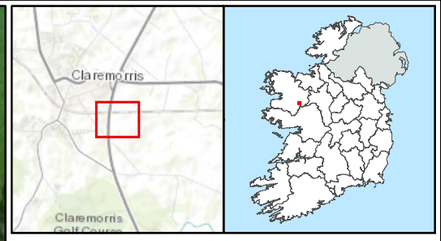

Legend

- Site Boundary
- Potential Rhizome Growth

Invasive Species:

- Cherry Laurel
- Japanese Knotweed
- Winter Heliotrope

N
W E
S

0 50 100 200 Meters

TITLE: Invasive Species			
PROJECT: Claremorris Historic Landfill			
FIGURE NO:	3.1		
CLIENT:	Mayo County Council		
SCALE:	1:2500	**REVISION:**	0
DATE:	06/05/2022	**PAGE SIZE:**	A3

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4. INVASIVE SPECIES ACCOUNTS

The International Union for Conservation of Nature (IUCN) in their 'IUCN Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species' 2000 report describes non-native invasive species (referred to as an invasive species) as:

> "*an alien species which becomes established in natural or semi-natural ecosystems or habitat, is an agent of change, and threatens native biological diversity*".

The three invasive species below were recorded within the remediation site. The species in bold are included in the Third Schedule, the remaining are identified in Kelly et al., (2008). *Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland.* A report prepared for the Northern Ireland Environment Agency and National Parks and Wildlife Service as part of Invasive Species Ireland. Accounts of these species, summaries of their ecology, distribution, growth, and management periods are included below.

- Japanese knotweed (*Fallopia japonica*)
- Winter heliotrope (*Petasites fragrans*)
- Cherry laurel (*Prunus laurocerasus*)

4.1 Japanese knotweed (*Fallopia japonica*)

According to the Invasive Species Ireland Project who have carried out a risk assessment of Japanese Knotweed (*Fallopia japonica*), which is distributed throughout the island of Ireland, the species is "*one of the highest risk (most unwanted) non-native invasive species in Ireland".* The species poses a risk to open and riparian areas where it spreads rapidly to form dense stands, excluding native vegetation and prohibiting regeneration. This process has been known to reduce diversity and alter semi-natural and locally important habitats for wildlife. Once stands become established, they are extremely persistent and difficult to remove. Japanese knotweed can grow through weaknesses in both tarmac and concrete. Population clusters must be completely removed, under appropriate licencing, before site works or specific projects within the site can commence (Kelly et al., 2008).

4.1.1 Species Ecology

Although Japanese knotweed plants flower, all flowers in Ireland and Britain are female, precluding the possibility of sexual reproduction. The means of spread is entirely through the movement of rhizomes or rhizome fragments in soil or cut stems. Japanese knotweed has an extraordinary ability to spread vegetatively from crown, stem and rhizome (underground root) if disturbed. Even tiny amounts of cut stem, crown or rhizome can produce a new plant.

Controlling the spread of the species is therefore dependent on preventing the spread of the stem, crown or rhizome. Japanese knotweed causes numerous impacts, both ecological and economic. It is capable of outcompeting native plants and blocking commuting corridors of native mammals, and damaging buildings, tarmacadam and concrete. In waterways, it can block and reduce water flow, increasing the risk of flooding. In winter, when it dies back, it can leave riverbanks bare and open to erosion.

Red/purple shoots appear early in spring, which in some cases have an asparagus-like appearance but, as the canes grow, the leaves unfurl, and the plant takes its more characteristic appearance. The mature canes are like bamboo, being hollow, and have a characteristic pattern of purple speckles.

The leaves are shield-shaped with pointed tips and a flat base, arranged in a zig-zag formation. The plant can grow to over 3m in height. Flowering occurs in late summer/autumn (End July – typically August) and consists of small creamy white flowers. During the winter the leaves die back and reveal orange/brown woody erect stems. Rhizomes are bright orange inside and can extend to a depth of 3m and a width of 7m around the visible growth above ground.

Source: "Expansion of Japanese Knotweed" by U.S Fish and Wildlife Service – Northeast Region is licensed with CC PDM 1.0 (https://www.flickr.com/photos/43322816@N08/5951588772)

Plate 4-1: Characteristic Features of Japanese Knotweed

4.1.2 Timeframe

Japanese Knotweed shoots typically appear between March and April. During this time energy stores from the root system are used to facilitate initial growth. The summer growth period commences in May and lasts until July, typical growth occurs during this time. Flowering begins in August and lasts until October. During this time the pale flowers can be seen.

Figure 4-1 indicates the suitable period which glyphosate herbicide is used to remove Japanese Knotweed. It is suitable to use glyphosate herbicide on knotweed between the months of May and October, with August, September and October being the preferred months of use.

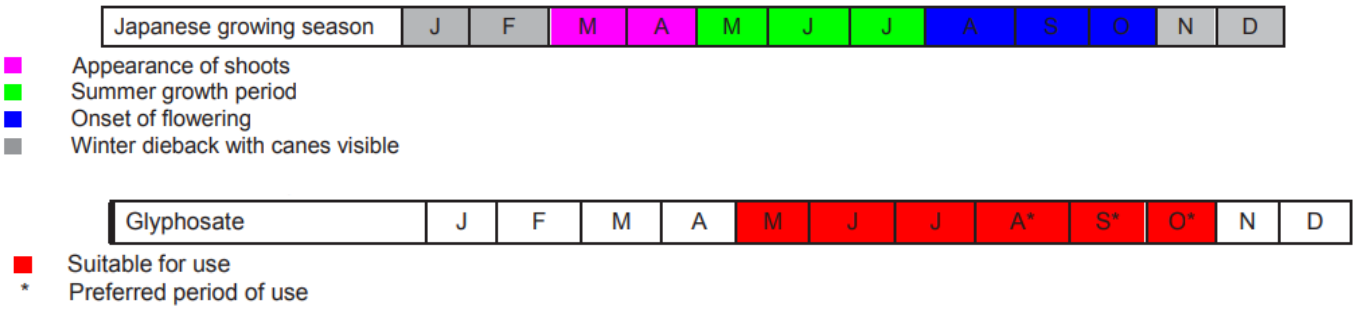

Figure 4-1: Japanese Knotweed Growth season summary (Kelly, et al., 2008).

4.2 Cherry Laurel (*Prunus laurocerus*)

4.2.1 Species Ecology

Cherry laurel is an evergreen shrub that forms dense thickets of either a single stem or multiple stems (especially if it has been trimmed). It has thick 5-15cm long oblong-ovate leaves; glossy green on surface and pale underneath. Leaves are arranged alternately on short leaf stalks and leaf edges are toothed with pointed tips. Small white fragrant flowers are held in clusters (racemes) and flowers are comprised of five petals and many yellow stamens. The clustered fruits are purple/black and cherry like.

Source: "Cherry Laurel" by edenpictures is licensed CC BY 2.0 (https://www.flickr.com/photos/10485077@N06/49845235411)

Plate 4-2: Characteristic Features of Cherry Laurel

4.2.2 Timeframe

Cherry laurel can be cut down at any time of year; the herbicide glyphosate can also be applied throughout the year, however May to October inclusive is a sub-optimal period. Of principle concern when cutting and/or moving vegetation or surrounding soil is the movement of viable seeds. As such the optimal time for cutting is outside the flowering and fruiting period.

4.3 Winter Heliotrope (*Petasites fragrans*)

4.3.1 Species Ecology

Winter heliotrope (*Petasites fragrans*) is an invasive plant species, native to North Africa and the Mediterranean. It often forms dense carpets of kidney-shaped leaves, 20-50cm wide, and is not often confused with other species. Heliotrope prefers damp areas and embankments, both within waste ground areas and cultivated land. It can often be found along roadways and drains.

These deciduous plants produce large roundish leaves up to 30cm in diameter. These are downy underneath. Its pale pink flowers have a distinctive sweet smell and flower in December and January. Foliage forms a dense carpet with a height of approximately 30cm. Its rhizomatous root system allows vegetative spreading. Plate 4-4 displays some characteristic features of winter heliotrope. The winter heliotrope plants in Ireland are all clone males, originating from a single male, through fragmentation. These male plants are unable to produce seed and thus rely on root systems and fragmentation to spread. The species is thought to be widespread, but under recorded, in Ireland. Thought to have been introduced in the 1800s, first reported in pre-1866 records, it's believed that the species was originally either planted as winter ground cover or as a foodplant for bees (Reynolds, 2002)

Source: "*Petasites fragrans* (Winter Helitotrope)" by Hugh Knott is licensed with CC BY-ND 2.0 (https://www.flickr.com/photos/148695759@N02/34108451431)

Plate 4-3: Characteristic Features of Winter Heliotrope

4.3.2 Timeframe

It can be dug up any time of the year when soil is suitably dry.

5. PROPOSED MEASURES FOR MANAGEMENT OF INVASIVE SPECIES

5.1 Recommended Measures

While it is extremely important and more efficient to contain invasive species at the point of infestation, care shall also be taken to ensure the management plan (Section 6) shall also be adhered to ensure that the species is not spread outside the works area.

Invasive Species Ireland (ISI) notes that invasive non-native species are the second greatest threat (after habitat destruction) to worldwide biodiversity. Invasive species negatively impact Ireland's native species; changing habitats and ultimately threatening ecosystems which impacts on biodiversity as well as economics as they are costly to eradicate.

Through prevention, early detection, rapid response, eradication and control measures, we can reduce the risk of their introduction, establishment, spread and impact (Invasives.ie, 2022)

5.1.1 Prevention of spread within the works footprint

Prevention of the spread of invasive species will be achieved by:

- The full implementation of the invasive species management plan (Section 6) in conjunction with a competent and experienced Invasive Species Specialist Contractor.
- Supervision of control measures and treatment works by an appropriately qualified ecologist or invasive species specialist.
- Raising awareness to site workers via toolbox talks given by a suitably qualified person as part of site introduction; informing workers what to look out for and what procedure to follow if they observe an invasive species.
- Where invasive species have been physically removed and soil disturbed, this soil will be seeded or replanted (including 5cm deep mulch) with native plant species. This will prevent erosion and the easy colonisation of bare soil by invasive species in the area.
- Unwanted material originating from the site will immediately be transported off site by an appropriately licensed waste contractor and disposed of properly at a suitably licenced facility, in accordance with the (NRA, 2010) guidelines, i.e. where cut, pulled or mown non-native invasive plant material arises, its disposal will not lead to a risk of further spread of the plants. Care will be taken near watercourses as water is a fast medium for the dispersal of plant fragments and seeds. Material that contains rhizomes, flower heads or seeds will be disposed of either by composting or burial at a depth of 2m, or disposal to licensed landfill in the case of non-native invasive species. All disposals will be carried out in accordance with the Waste Management Acts.
- Signs will warn people working within the site that there is invasive species contamination.
- Ensure appropriate biosecurity measure are in place, these will include the Check Clean Dry method, along with those outlined below:
  - Remove the build-up of soil on equipment
  - Keep equipment clean
  - Do not move fouled equipment from one site to another,

  - Footwear and clothing of operatives working near invasive species should be checked for seeds, fruits, knotweed rhizomes or other viable material before exiting the site
  - All vehicles exiting the site will be examined to prevent the transport of rhizomes, seeds and other plant material.
  - Soil, rhizomes and other material cleaned down in the excavation area will be buried in the burial cell.
- Follow instructions provided for containment of invasive species (Section 5.2).

5.2 Containment

The three most common ways a site can become infected are:

1. Importation of infected soil.
2. Contamination on vehicles and equipment.
3. Illegal dumping.

Containment of invasive species at Claremorris Closed Landfill will be achieved by:

- A licensed invasive species contractor shall be engaged to remove invasives prior to remediation works.
- No contaminated soil (contamination from non-native species) or vegetation shall be removed from site unless proper biosecurity (Refer to Section 5.1.1. above) is observed and removal by an appropriately licensed waste contractor to a suitably licenced facility.
- New sightings of the invasive plant species identified within the site (refer to Section 3.2) shall be relayed to the contractor for invasive species control. These areas shall follow the same protocol as the current infected areas.
- It is possible, particularly in the first year of control, that new plants will sprout following the initial removal/treatment, either because shade suppression will be reduced or due to soil disturbance. As such, several additional visits will likely be required. Three visits, May/June, July/August and September/October should be sufficient to catch all regrowth, although, a cautionary approach is advisable.
- Plants that germinate after September/October are very unlikely to have sufficient time to complete their life cycle and produce seeds.

5.2.1 Japanese Knotweed (*Fallopia japonica*)

One method of treatment is proposed for Japanese knotweed on site. Additionally, the following site hygiene measures will be implemented during the proposed works:

- Japanese Knotweed root systems can extend up to 7m in a lateral direction (but usually only up to 5 m), and 2m deep from the over ground parent plant. This buffer zone and infested area will be fenced off prior to and during works where possible to avoid spreading seeds or plant fragments around or off-site.
- Erection of adequate site hygiene signage in relation to the management of non-native invasive material as appropriate and to inform contractors of the risk.
- All staff shall be made aware of nature of threat via toolbox talks as part of site inductions.
- Ensure all site users are aware of measures to be taken and alert them to the presence of the Invasive Species Management Plan.
- Site works will only be allowed within exclusion zones following the removal of Japanese knotweed and contaminated soil.
- All machinery vehicles, equipment, footwear and clothing operating within area of infestation to be thoroughly checked and cleaned in appropriately contained area prior to leaving the area to protect against further spreading of Japanese knotweed.
- Avoid if possible using machinery with tracks in infested areas.
- No stockpiling of contaminated soil will occur on-site.
- For soil imported to the site for infilling of embankments, the contractor will gain documentation from suppliers stating that it is free from invasive species.

Excavation

Japanese knotweed will be buried at a minimum depth of 2m and fully encapsulated with a root barrier membrane cell. The burial cell will be within the site boundary, centrally located within the proposed capping area. This will be a root barrier specifically designed for Japanese knotweed, designed to remain intact for at least 50 years (as per guidelines). A buffer layer of sand will be placed above and below, it will be infilled to 2m with inert fill or topsoil. This method meets the requirements of the UK Environment Agency, (2019).

The proposed location for Japanese Knotweed Burial is shown in a drawing accompanying this planning application (Drawing Reference: P21-287-0100-0014)

5.2.2 Winter Heliotrope (*Petasites fragrans*)

Generally, site-wide control measures for this species are not required; however, areas of bare soil should be re-vegetated as soon as possible to reduce the amount of suitable habitat for these species. Additionally, donkeys should be excluded from this area, due to evidence of spread of this particular species via donkeys on site.

Source: Fehily Timoney

Plate 5-1: Potential Spread of Winter Heliotrope by Donkeys at Claremorris Closed Landfill

Physical control

Excavation of winter heliotrope can be completed at any time of year when soils are suitably dry. All plant material, particularly the rhizomes, should be excavated and processed appropriately. Regular follow-up treatment should be completed to combat re-sprouting (NRA, 2010).

Contaminated plant matter, soils and other materials and buried on-site at a minimum depth of 2m or removed off-site to an appropriately licensed facility. This will be carried out in accordance with the NRA (2010) guidelines (refer to Section 5.1.1).

5.2.3 Cherry Laurel (*Prunus laurocerus*)

One option for the treatment of cherry laurel has been proposed and may be used to eradicate cherry laurel where it will be disturbed by construction and to avoid the spread of the species. The following general recommendations will be adhered to as part of the plan:

- Construction works will only be allowed within exclusion zones once the species has been fully eradicated.
- No treatment measures are to take place in these areas without supervision and agreement by appointed cherry laurel eradication specialist.
- The cherry laurel plant contains cyanide and as per good practice will only be handled with gloves. This plant will be disposed of via an appropriately licensed waste facility.
- Equipment, clothing and footwear will be checked following treatment operations or work in the vicinity of the species and cleared of fruits/seeds as necessary.

Cut to stump and dig out stump; bury

This method involves cutting the main stem of the plant near ground level and digging out the stump and any visible roots. This option is not usually practical in areas where there are other invasive plants present as the disturbed soil can allow for the setting of seeds or the spread of rhizomes of adjacent species (ISI, 2008).

6. MANAGEMENT PLAN

The management of any invasive species is achieved by the assessment and mapping of the invasive species, containment once found, continual monitoring and record keeping as well as the safe disposal of invasive species material. It is recommended that surveys be carried out periodically at the site to monitor the extent of invasive flora and the success of the control and management measures. These can be carried out by FT, or a contractor specialised in invasive flora treatment. Monitoring should continue during the remediation works and as part of the post remediation monitoring to make sure successful control has been achieved. All invasive species which occur within the area utilised by people and machinery during the proposed remediation works will be controlled/removed from the works area before commencement of works.

6.1 Containment

For the efficient use of resources namely, financial, and physical effort, it is important to prevent the further spread of invasive species. Containment will be achieved using measure outlined in Section 5 and those presented below:

- Landholder to be informed of location of the invasive species and the management plan.
- Ensure anyone treating the infestation is a suitably qualified trained professional who follows the management plan.
- The site will be re-surveyed prior to treatment/remediation works to confirm the findings of the original survey.

6.2 Schedule

Periodic re-surveying for all invasive species will be required, to ensure that treatment measures were effective, and to trigger further treatment if necessary. Refer to Table 6-1.

Please note that the schedule may require amendment following any given site visit.

Table 6-1: Schedule for Management of Invasive Species

Time	Details of measures
Pre remediation (Isolation of Invasives)	• A pre-treatment survey (to reconfirm the findings of the ISMP) will be undertaken during the growing season to mark out the extent of invasive species within site prior to any works commencing. • Treatment/ control of invasive species will be undertaken using the methods proposed in Section 5. • Invasive species to be retained on-site (notably Japanese knotweed) will be buried at a minimum depth of 2m from the top of buried material and fully encapsulated with a root barrier membrane cell. • Infested/ cleared areas will be demarcated and appropriately signed to prevent access to unauthorised personnel. • Any disposal of plant matter and soil off-site, should be completed through an appropriately licenced contractor and waste facility.
During remediation (General Clearance and Minor Profilin, Burial Cell Construction, Invasive Burial, Capping Works)	• Following treatment, site to be monitored for signs of regrowth/ spread to new areas. • Toolbox talks shall be given to all personnel accessing the site, informing them of the locations of the invasive species and instructing them not to enter these areas (unless they are licensed invasive species contractors or ecologists). • A clean down area within the excavation area will be identified and a suitable membrane will protect the soil from further infestation. Soil and plant material gathered in the clean down area shall be buried in the burial cell. • Designated curtailment areas will be demarcated for the transport of Japanese knotweed from infested areas to the burial cell. • Machinery to be used in the control of Japanese knotweed will be itemised, and only those machinery will be used for excavation. • The build-up of soil on equipment will be removed and fouled equipment will not be moved between sites, or between the curtailment area/clean down area and the rest of the landfill. • Footwear and clothing of operatives working near invasive species should be checked for rhizomes, seeds, fruits, or other viable material before exiting the site. Boot brushes will also be utilised. • All vehicles exiting the site will be examined to prevent the transport of seeds. • If re-growth of invasive species is discovered, further treatment/control will be completed using the treatment methods in Section 5. • Site to be monitored during remediation works for signs of regrowth of all invasive species, Invasive plant material to be buried in suitable location with appropriate depth (2m above buried material) available within the site. The burial cell will be within the site boundary, centrally located within the proposed capping area. • The burial cell will be signposted and demarcated to prevent accidental uncovering.

6.3 Mapping, Evaluating and Record Keeping

During the pre-remediation and remediation phase the following will take place before control measures:

- Check that the area of infestation is still cordoned off and a warning/information sign is still in place
- Photographs of the area(s) of invasive species infestation
- Map the extent via recording GPS coordinates and measure the length and width of infestation (including above and below ground rhizome growth) and plot on map
- Evaluate the status/condition of the infestation
- Make sure the above steps are recorded.

At the end of each site visit the recorded data should be compared with the findings of this report. Preparation of a short report on the progress of treatment following treatment works, and any subsequent monitoring.

6.4 Appropriate Disposal

6.4.1 Storage

As described in Section 5, all cut and excavated plant matter will be stored securely in line with the relevant treatment methodology.

6.4.2 Disposal

6.4.2.1 Burial

Burial of plant matter and possible contaminated soil is to be completed as per the species-specific conditions discussed in Section 5.

6.4.2.2 Licensed Disposal

Disposal of plant matter and soil off-site if required, will be completed through an appropriately licenced haulier and waste facility.

7. DISCUSSION

There is a legal obligation not to spread plants listed on the third schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021; the relevant species Claremorris Closed Landfill, and therefore those of principal concern, is Japanese knotweed (*Fallopia japonica*). Additionally, of concern for the invasive species management plan are winter heliotrope and cherry laurel, which are present within the site boundary. Liaison with landholders of adjacent lands may be necessary to effectively control invasive species in the area and to prevent re-infestation.

It is recommended that a competent and experienced invasive species management contractor is appointed to treat and control invasive species. A dedicated invasive species survey is recommended to be undertaken by the appointed contractor to re-confirm the findings of the previous survey and to identify any new areas/species of infestation.

It is recommended that infested and cleared areas, as well as the burial cell, will be appropriately demarcated and signed to prevent access to unauthorised personnel. Additionally, appropriate biosecurity to prevent spread of invasive species is recommended., as stated in Section 5 for each species, and Section 5.1.1. for general biosecurity measures.

8. CONCLUSION

This Invasive Species Management Plan (ISMP) has been prescribed for Claremorris Closed Landfill and its proposed remediation, to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 (not to cause the spread of non-native invasive plant species listed in schedule III), and to ensure non-native invasive plant species not listed in schedule III are not spread to adjacent land or Natura 2000 (European) sites. The report details a programme for the mapping and control of invasive species at the remediation site within the unauthorized landfill site.

The plan will prevent the spread of identified non-native invasive species within and from the site and reduce the potential risk for the introduction and/or spread of new invasive species within the site pre, during and post remediation.

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