KERDIFFSTOWN LANDFILL REMEDIATION PROJECT

Construction Environmental Management Plan (CEMP)

Revision and Amendment Status Sheet

Original Issue Date: **Tender Submission**	11/11/20

Further revisions since original issue date.

Page Number	Date of Amendment	Details of Amendment	Authorised by	Revision No.
8, 9, 11, 13, 14, 16, 17, 18, 20, 29, 30, 32, 35, 37, 38, Appendix C	13/01/21	Revisions made based on ER & KCC comments	JS, KD	01
10, 12,13, 14, 15, 16, 22, 38, 39, 40, 43, 52, Appendix B, C & D	15/01/21	Revisions made based on ER & KCC comments	JS, KD	02

EHS Dept. Revision No: 01	
Reason For: Issue:	EMP, For site operation 20-10-2020

Originator	Reviewer	Approver	Client Approval
JC	PQ	EO'K	Employer's Representative

Copy	Circulation:	Name	Company	Location
1	Commercial Manager	DK	WBL	Head Office
	Contracts Manager	EO'K	WBL	Head Office
2	Project Manager / Site	KD	WBL	Site
4	General Foreman	PO'G	WBL	Site
			WBL	Site
5	Site Environmental Engineer	JS	WBL	Site
	Company Environmental Manager (CEnv)	PQ	WBL	Head Office
6	Site Engineers	CC	WBL	Site
		OP	WBL	Site
7	Sub Agent (Infrastructural Compound)	CB	WBL	Site
	Sub Agent (Earthworks)	SC	WBL	Site

NOTE: THIS DOCUMENT MAY CHANGE UPON COMMENCEMENT

Contents

1.0 INTRODUCTION

This document comprises a Construction Environmental Management Plan (CEMP) for the Kerdiffstown Landfill Remediation Project, Co. Kildare, Ireland. It is based on the outline Construction Environmental Management Plan (OCEMP) and common elements pertaining to this Construction Environmental Management Plan are included for consistency. It is a live document and is subject to update over the duration of the project.

An Industrial Emissions licence (IEL) has been granted to Kildare County Council by the EPA (Reg. No: P1063-01) on 7th March 2019. Therefore, any work carried out as part of this project will be subject to the conditions set within the granted IE licence.

The CEMP comprises the following elements:

Section 2.0 Description the of Works

This chapter provides an overview of the scope of works to be undertaken as part of this contract, including locations of works, overall project description, duration of works etc. The purpose of this section is to fully understand the nature of the works so that potential impacts and mitigation measures can be identified.

Section 3.0 Roles and Responsibilities

This chapter provides an overview of the environmental related roles and responsibilities on-site to ensure the successful implementation of the remediation phase.

Section 4.0 Environmental Management

The objective of this part of the CEMP is to capture all mitigation measures put forward within the EIAR and IE licence along with conditions imposed by An Bord Pleanála (ABP) and the relevant authorities. It provides additional detail to outline a practical programme of measures to be developed by Wills Bros Ltd. Management Plans shall be developed by Wills Bros Ltd and agreed with KCC and the relevant competent authorities in advance of the final Contract being signed.

Construction method statements will be developed by Wills Bros Ltd to manage the construction activities in accordance with this CEMP, Environmental Impact Assessment Report (EIAR) commitments, including mitigation measures and various management plans (dust, traffic, noise etc.), IE licence commitments and the conditions of the Planning Permission.

Section 5.0 Environmental Training and Communications

The objective of this chapter is to demonstrate the training programmes with regard environmental induction and toolbox talks that will be implemented through environmental training to staff.

Section 6.0 Monitoring & Auditing

This chapter identifies arrangements for monitoring compliance with environmental requirements on site and auditing and inspections.

Section 7.0 Management Review

2.0 DESCRIPTION OF WORKS

The Project involves the remediation of the Kerdiffstown Landfill site and development of the site as a multi-use public park. This is to be achieved by clearing and reprofiling the existing site, installing an engineered capping system, improving the management of landfill gas, leachate and surface water and provision of landscaped and recreational areas. Refer to Volume A Works Requirements Book A2 Drawings for the current site layout and final remediated site layout.

The facility at Kerdiffstown was operated under Waste Licence W0047-01 (and subsequent revised licence W0047-02) issued by the EPA in 2003. The former landfill and waste processing facility at Kerdiffstown has since closed and has temporary emergency measures installed to minimise environmental risks. Since 2012 the EPA, and following transfer of the project in 2015, Kildare County Council, have been using powers under Section 56 (A) of the Waste Management Act 1996 (as amended) to manage the site and put in place appropriate measures in order to prevent and limit environmental pollution from waste materials which are present on site. An Industrial Emissions Licence (P1063-01) was issued by the EPA on the 7th March 2019 to allow for the proposed remediation plan.

Project Name	**2587-Kerdiffstown Landfill Remediation Project**
Project Location	The site is situated at Kerdiffstown, Johnstown road, Naas, Co Kildare. https://goo.gl/maps/CYbtFQbJz2zjGE796
Client	Kildare County Council
Commercial Manager	DK
Start Date	16th November 2020
Planned Finish Date:	December 2022
Duration (Months):	104 Weeks approx..
Primary Project Type	The proposed Project is to remediate the Kerdiffstown Landfill site and develop the site as a multi-use public park. This is to be achieved by clearing and reprofiling the existing site, installing an engineered capping system, improving the management of landfill gas, leachate and surface water and provision of landscaped and recreational areas.

The works included in this contract in order to achieve the remediation objectives include, but are not limited to the following;

- Reprofiling of waste mounds to ensure the capping system works effectively and to facilitate the use of the site as a public park.
- Preparation and placing of a regulation layer in areas to be capped.
- Installation of a permanent capping system across all existing waste areas to prevent rainfall infiltration, to manage surface water runoff, to reduce the production of leachate and to capture landfill gas.

- Installation of new systems to manage and control leachate and landfill gas and which will include the construction of a dedicated Landfill Infrastructure Compound and landfill gas flares (where extracted landfill gas is burned off).
- Construction of a leachate pipeline from the site, which will cross under the Morell River and N7 into Johnstown Pumping Station.
- Construction of a foul/ wastewater pipeline connecting the site with Johnstown Pumping Station. This pipeline will run parallel to the leachate pipeline and will carry foul/ wastewater from the site office and changing room building.
- Installation of surface water drainage to manage water on, and draining from, the site including surface water ponds and a surface water outfall point to the Morell River.
- Decommissioning of existing services, in particular an underground storage tank approximately 20m3 in capacity. There are also a large number of concrete structures (walls of former buildings) to be demolished.
- Processing of demolished concrete and other waste materials on site to produce engineering grade materials for re-use on site.
- Development of a public park with multi-use sports pitches, car parking, a changing room building, children's playground and a network of paths across the site; and
- Landscaping works across the site including grass seeding, planting of trees and shrubs, and ongoing maintenance of landscaping, including watering, fertilising, grass cutting, weeding etc., for the full maintenance period of the works.
- There will be a range of potential impacts during the construction works including odours, noise, dust, contamination of surface waters, etc. Prior to the works commencing the Works Contractor will be required to prepare the Construction and Environmental Management Plan (CEMP) setting out how the potential impacts will be monitored, mitigated and managed in accordance the Works Requirements.
- The Kerdiffstown Landfill site is currently closed, in a disused state and poses a long-term risk to the environment due to pollution by landfill gas, odour and leachate. Therefore, there is a need to remediate the site.

Kildare County Council hold an Industrial Emissions Licence (Reference P1063-01) issued by the EPA on the 7th March 2019 for the remediation of the Kerdiffstown Landfill site. Kildare County Council, as the licence holder, will maintain a full-time presence on the site for the duration of the Works and will require access throughout the site to carry out all monitoring required to comply with the licence. Current activities include landfill gas extraction and flaring, as well as leachate collection and removal to a licenced treatment facility by tanker.

The site covers an area of approximately 31 hectares with an estimated waste volume of around 3.1 million m3. The waste in the landfill typically comprises non-hazardous mixed construction and demolition (C&D) wastes and household / municipal solid wastes (MSW).The C&D wastes are noted in the EIAR to contain varying amounts of clay, gravel, concrete, brick, wood, textile, plastic, rubber and metal, and varying amounts of plastic, textiles, wood, ash, paper, cables and steel.

Site Zones are highlighted in the map referenced from Outline Construction Environmental Management Plan (OCEMP) as shown below in figure 2-1.

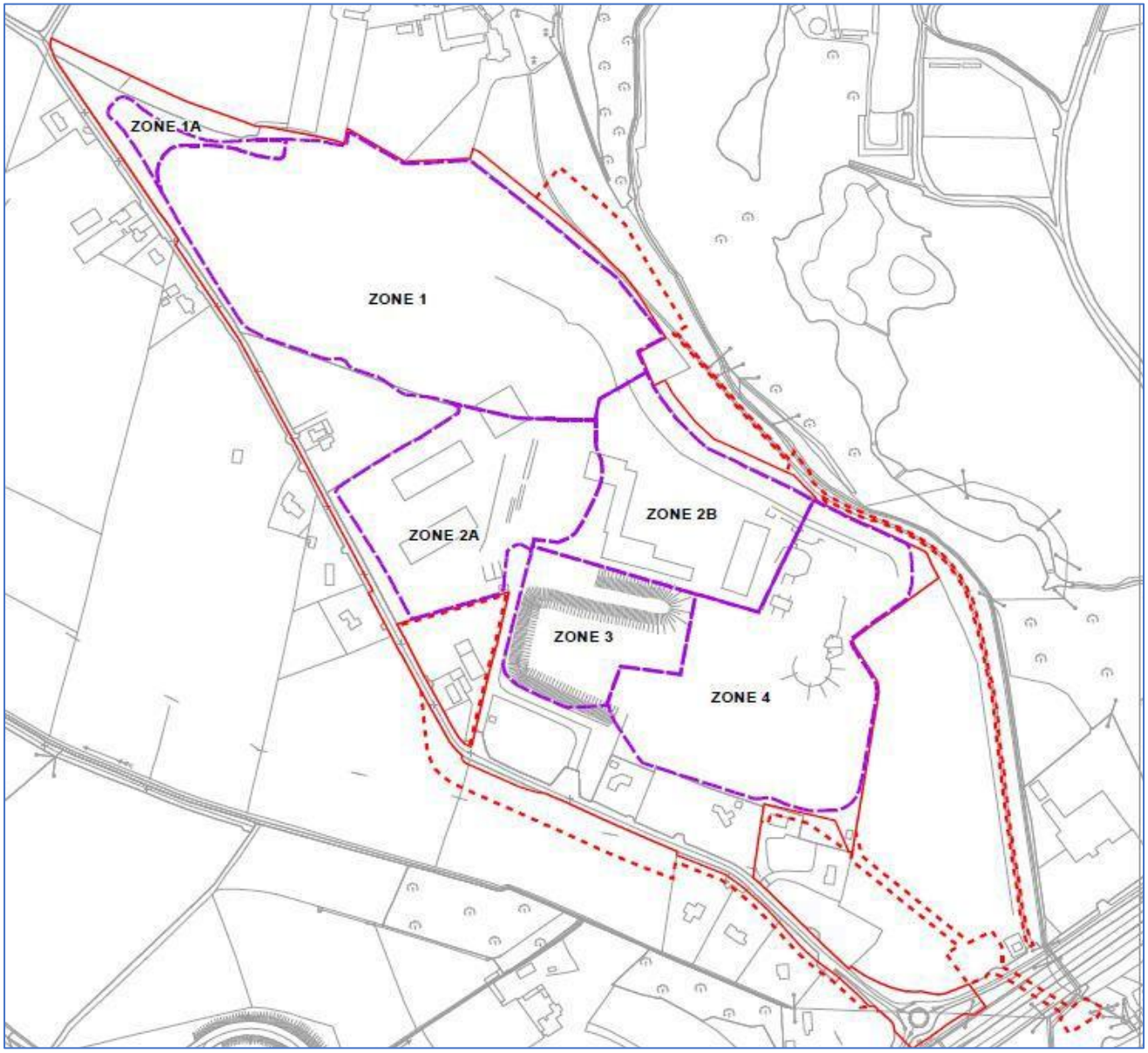


Figure 2-1 Site Zones

2.1 Site Management Structure

TITLE	DETAILS	CONTACT DETAILS
Client	**Kildare County Council** Áras Chill Dara, Kerdiffstown Park, Naas, Co. Kildare.	Contact: Mr. James Mulligan – Project Manager Contact: 086 384 1655
Designers	**RPS** West Pier Business Campus, Dun Laoghaire, Co. Dublin.	Contact: Jim Leahy Email: ireland@rpsgroup.com Phone: 01 4882900
Project Supervisor Design Stage	**RPS** West Pier Business Campus, Dun Laoghaire, Co. Dublin.	Contact: Jim Leahy Email: ireland@rpsgroup.com Phone: 01 4882900
Project Supervisor Construction Stage (PSCS)	**Wills Bros Ltd** Civil Engineering Contractors Ballylahan Bridge Foxford, Co. Mayo Co. Mayo F26NP92	Project Manager: Kevin Doyle Head Office 094 9256221 Email: info@willsbros.com

2.2 Environmental Objectives & Targets

The objectives and targets are set in relation to the aspects identified in order to reduce our significant aspects. As a minimum the objectives for Environmental protection during the remediation works include:

- Residents and other People Sensitive Receptors kept informed at all stages of Remediation Works;
- Minimising construction noise/vibration;
- Minimising dust;
- Minimising odour;
- Minimising impacts on badgers;
- Minimising impacts on all site biodiversity and invasive species;
- Minimising disruption to general public and road users;

Carbon Footprint Reduction Proposals

In compliance with requirements of Condition 7.1 of the Industrial Emissions Licence (P1063-01), the following objectives has been developed to detail our proposed carbon footprint reduction measures, commitments and initiatives during remediation works on the Project.

1. Imported Article 27 Material - Minimise travel distances to Site for sustainably sourced Article 27 materials to be imported to Site;
2. Concrete Supply – Minimise travel distances to site by selected use of local concrete suppliers;
3. Local suppliers – Minimise travel distances to site by procuring from locally based suppliers;
4. Reuse of demolished concrete walls material – sustainable onsite reuse of demolished concrete wall materials;
5. Reuse of mulched site clearance - sustainable onsite reuse of mulched site clearance for temporary waste cover. This will be achieved where practicable, localised to where we are working. The material will be gathered up and we can harvest a stockpile.
6. Employee commuting – promotion of sustainable modes of transport to site for workers;
7. Energy efficient office and welfare facilities - provision of modern office and welfare facilities with energy saving measures;
8. Rainwater harvesting – installation of rainwater harvesting system at office and welfare facilities;
9. Reuse of captured surface waters- sustainable onsite reuse of captured surface waters for minimising dust emissions;
10. Waste recycling – sustainable recycling of tyres into reusable product by specialist contractor; sustainable recycling of steel, rebar etc. into reusable product by specialist contractor; setup of designated waste recycling and segregation area on site;
11. Efficient use of modern construction post – reduce CO2 emissions through use of modern and regularly serviced construction plant and haulage fleets;
12. Optimise mass haul – WBL will develop and implement an optimised mass haul strategy for the project. This will increase efficiency during earthworks thereby reducing fuel consumption by construction plant engaged in mass haul operations.
13. Early leachate pipeline and connection to Johnstown Pumping Station – Eliminate tanker transportation of leachate to Ringsend Wastewater Treatment Plant early;
14. Temporary construction task lighting – provision of energy efficient task lighting during site construction works;
15. GPS functioning construction plant – improve efficiency and productivity though use of GPS;
16. Digital inspections – reduce use of paper through use of paperless QA and EHS inspection system.

2.2.1 Environmental Management Targets

The environmental management targets for the project are shown in the following table:

Objectives	Targets	Measurable	Methodology	Responsibility	Timescale
Minimising Dust	Ensure dirt on roads is kept to a minimum, Lower emissions of dust, smoke and fumes during works	Increase road cleaning duties during wet or busy periods, Air quality, dust particle measurement (Bergerhoff Method)	Ensure roads are swept and cleaned on a regular basis. Road conditions within the site should be kept clean at all times. Ensure all equipment is well serviced and maintained. Switch off equipment when not in use. Use dust suppression techniques when applicable	POG DOC	Start to completion
Sustainable reuse of existing material	As far as reasonably practicable Zero waste being sent to landfill	Lean Construction Techniques, segregation, reuse and recycling (waste hierarchy)	Materials reused in construction	KD	Start to completion
Prevention of Pollution	Lower fuel and oil spillages from site activities. Bunds to be used with all fuels and oils	Environmental Incidents, spills contained in bunds	Ensure that drip trays are used when needed under static plant. When refilling, & storing, ensure fuel storage areas are kept clean and dry. Use proper closures and containers.	POG DOC	Start to completion

Objectives	Targets	Measurable	Methodology	Responsibility	Timescale
Waste Management	Ensure correct disposal of all hazardous wastes	Waste segregation, waste	All hazardous wastes to be disposed as per Irish Legislation and WBL requirements	KD	Start to completion
Minimising impact on local watersbodies	Ensure no incidents of pollution by sediment discharge to water.	Use silt protection in exposed gullies. Water monitoring and sampling activities. Each in stream task planned and approved by Eco Specialist and checked during execution to ensure compliance. Stop work policy where there is a fear of suspected pollution	Sediment controls to be used, no waters to be discharged to any controlled waters or drainage systems. Work with CIRIA guidelines and apply WBL precautionary measures	POG DOC	Start to completion
Residents and other People Sensitive Receptors kept informed at all stages of Remediation Works	Reduce amount of Public complaints	Complaints received to Site Management Team, consultation records with local stakeholders	Ensure when works which will impede public access are taking place, all residents are informed for the timescale (where applicable) and all restrictions are kept to a minimum	KD	Start to completion

Objectives	Targets	Measurable	Methodology	Responsibility	Timescale
Rainwater Harvesting	Minimise water usage consumption	Water charges, wastewater disposal (discharge volumes)	All grey **uncontaminated** water to be reused on site where possible for dust suppression and washing. 'Fresh' water supply to be kept to a minimum where possible. TBT- Water on Construction Sites	POG DOC	Start to completion
Minimising Construction Noise	Minimise air- borne & ground- borne noise	Noise triggers breached (where applicable) alerts >70dB(A) off site works; >55dB(A) on site works	All construction noise limits set out in the requirements will be adhered to. Monitoring program to address risk /target areas. Maintain high level of awareness	All Drivers	Start to completion
Minimising Construction Vibration	Minimise vibration	Vibration triggers breached. Monitoring program with regular reporting.	All vibration limits set out in the works requirements, IEL will be adhered to.	All Machine Operators	Start to completion

Objectives	Targets	Measurable	Methodology	Responsibility	Timescale
Minimising impact on Invasive Species	Ensure no vehicle movement and material placement causes damage to invasive species. Minimise spread and disturbance of invasive species.	Correct invasive species protection used. Hoarding to isolate works area where necessary. Invasive Species to be identified by Ecologist and to be demarcated and signs erected.	All vegetation will be removed by mechanical means and only by experienced personnel. The use of herbicides or other chemicals will not be permitted. Burning vegetation either in-situ or in stockpiles will also not be permitted. For the treatment of invasive alien plant species (IAPS) refer to Appendix 40/1AR and the WBL invasive species management plan developed in accordance with Appendix 1/72AR.	POG DOC JS	Start to completion
Minimising impact on badger setts	Ensure no vehicle movement and material placement causes damage to badger setts.	Correct habitat protection used. Hoarding to isolate works area where necessary. Ecologically sensitive areas identified demarcated and signs	Non-disturbance of all identified Badger setts. Badger setts to be monitored. 50meter exclusion zone from December to June 30meter exclusion zone from July to November	POG DOC JS	Start to completion

The Site environmental management measures for the project are to:

1. Conduct all activities in accordance with the:

   i. Company environmental policy and Integrated Processes.
   ii. EIAR; CEMP; IEL
   iii. Relevant statutory regulations and provisions.
   iv. Contractual requirements from the client; and
   v. Requirements of relevant authorities.

2. Minimise adverse environmental impacts during construction.
3. Enhance natural environments during the course of construction, where practically possible.
4. Reduce the significance of the aspects and impacts through our working methods.

2.2.2 Initiatives to ensure compliance with 2020 Wills Bros targets

Area	Objectives & Targets	Method for achieving	Assistance by EHS Dept. (method)	Responsibility
TM	Minimum disruption to life of Town	Traffic management plan consultation with Road and traffic Authorities, Response to complaints and comments by 3rd parties	TMP, Site supervisor Ch8, Daily monitoring, planed movement of large pieces of plant and equipment, Approval of all works plans	AA
Cultural Assets	Minimum disturbance of cultural assets	Planned interventions, consultation with Cultural Authorities	Stop work policy in case of Archaeological or ecological concerns. Method to resolve concerns using Stop work protocols.	Engineer
Waste	Towards Zero waste to Landfill	Adhere to the waste hierarchy. Lean construction techniques	Excavated materials on site reuse materials CIRIA documents on Lean Construction	KD
	Increase site segregation of construction materials	Additional recycling skips on site Increase staff knowledge and participation	ECMP-10 waste definitions and classifications, TBT-Managing Waste, TBT-Environmental Awareness,	POG DOC

	100% recycling rates	Increase site awareness of improved waste management practices	Waste posters, environmental alerts and bullets to be issued focusing on new waste Strategies	Site EHS-TBA
Energy	Reduce CO_2 emissions at every opportunity	Implement an energy reduction initiative in sites and offices	Environmental information to be issued focusing on new waste strategies Switch Off / Plug out programme, Printer options to reduce colour cartridge use.	KD
	Energy initiatives	SEAI Initiatives	• Online calculation tools (energy) • Energy posters Relatively paperless sites	EHS Dept IT Dept. / GM on site set up
	Reduction in fuel usage / air emissions	Lighter vehicle/Car use	Procurement of low emissions vehicles by Plant Department. Video conferencing capabilities in Offices to cut down on travel times, emissions.	KD
	All sites to achieve >85% EHS performance score from quarterly audits	Quarterly audit review	Regular environmental information and directions to be issued to the sites	PQ JC
Env. Auditing & Performance	Appraisal system for environmental performance	Subcontractor appraisal system (COINS)	Detailed information of the systems and scores circulated to all.	AMC

3.0 PROJECT ROLES AND RESPONSIBILITIES

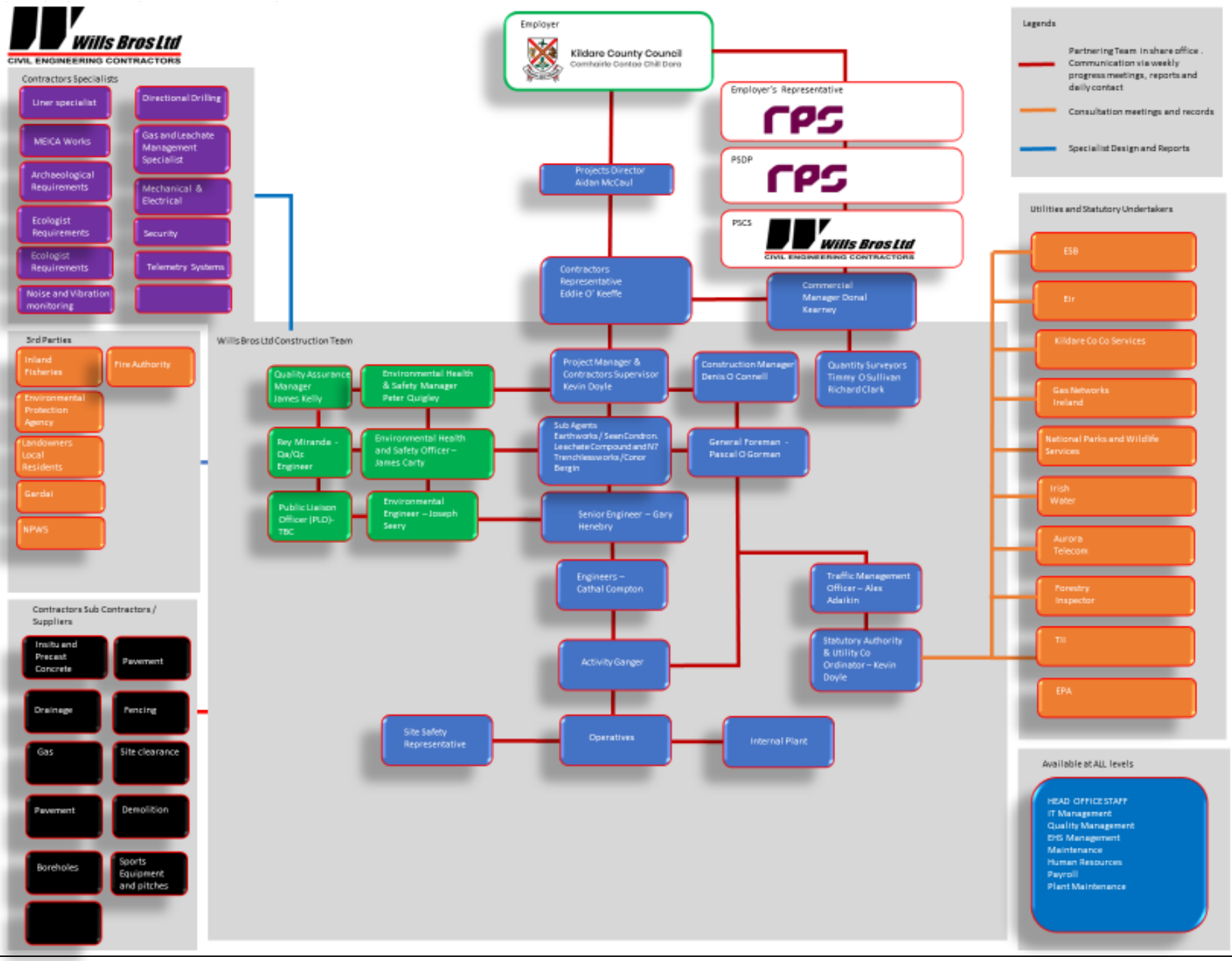
3.1 Organisation Chart

The organogram below details the key personnel involved in the project and the lines of communication for information relating to the scheme including information relating to Environmental matters:

The principal lines of internal communication in relation to the EMP and environmental matters are shown above. Environmental issues are communicated to staff through the site induction, toolbox talks and monthly safety meeting.

Communication with other external parties will be in accordance with the consultation requirements and in response to complaints (section 4). Communication with the Client, Company and Designers will take place during regular, documented meetings. Names, titles, and contact details are highlighted in section 2.1

CC


Wills Bros Ltd
CIVIL ENGINEERING CONTRACTORS
Contractors Specialists
Liner specialist
Directional Drilling
MEICA Works
Gas and Leachate Management Specialist
Archaeological Requirements
Mechanical & Electrical
Ecologist Requirements
Security
Ecologist Requirements
Telemetry Systems
Noise and Vibration monitoring
3rd Parties
Inland Fisheries
Fire Authority
Environmental Protection Agency
Landowners Local Residents
Gardai
NPWS
Contractors Sub Contractors / Suppliers
Insitu and Precast Concrete
Pavement
Drainage
Fencing
Gas
Site clearance
Pavement
Demolition
Boreholes
Sports Equipment and pitches
Employer
Kildare County Council
Comhairle Contae Chill Dara
Employer's Representative
rps
PSDP
rps
PSCS
Wills Bros Ltd
CIVIL ENGINEERING CONTRACTORS
Projects Director Aidan McCaul
Contractors Representative Eddie O' Keeffe
Commercial Manager Donal Kearney
Wills Bros Ltd Construction Team
Quality Assurance Manager James Kelly
Environmental Health & Safety Manager Peter Quigley
Project Manager & Contractors Supervisor Kevin Doyle
Construction Manager Denis O Connell
Quantity Surveyors Timmy O Sullivan Richard Clark
Rey Miranda - Qa/Qc Engineer
Environmental Health and Safety Officer – James Carty
Sub Agents Earthworks / Sean Condron, Leachate Compound and N7 Trenchless works / Conor Begin
General Foreman - Pascal O Gorman
Public Liaison Officer (PLO)- TBC
Environmental Engineer – Joseph Seery
Senior Engineer – Gary Henebry
Engineers – Cathal Compton
Traffic Management Officer – Alex Adaikin
Activity Ganger
Statutory Authority & Utility Co Ordinator – Kevin Doyle
Site Safety Representative
Operatives
Internal Plant
Legends
Partnering Team in shared office . Communication via weekly progress meetings, reports and daily contact
Consultation meetings and records
Specialist Design and Reports
Utilities and Statutory Undertakers
ESB
Eir
Kildare Co Co Services
Gas Networks Ireland
National Parks and Wildlife Services
Irish Water
Aurora Telecom
Forestry Inspector
TII
EPA
Available at ALL levels
HEAD OFFICE STAFF
IT Management
Quality Management
EHS Management
Maintenance
Human Resources
Payroll
Plant Maintenance

3.2 Responsibilities

Members of the site team and their respective roles and responsibilities are outlined in the table below:

Name	Initials	Contact No.	Company	Role (Job title)	Environmental Management Responsibilities
PQ	PQ	xxx xxxxxxx	WBL Ltd	Company Environmental Coordinator	Conducts Environmental Risk Assessment, advises on environmental issues and controls, and conducts internal environmental audits.
EOK	EOK	xxx xxxxxxx	WBL Ltd	Contract Manager	Approves, resources and implements EMP
KD	KD	xxx xxxxxxx	WBL Ltd	Project Manager	Liaison with Environmental, Archaeological and structural specialists, General foreman and foremen regarding Mitigation, monitoring and implementation of control measures, ensures that activities, including subcontractor activities, comply with the requirements of the relevant performance requirements.
DOC	DOC	xxx xxxxxxx	WBL Ltd	Plant and Foreman Manager	Liaison with Project Manager, Environmental, Archaeological and structural specialists, General foreman and foremen regarding Monitoring, implementation of control measures, ensures that activities, including subcontractor activities, comply with the requirements of the relevant performance requirements.
DOC POG	DOC POG	xxx xxxxxxx xxx xxxxxxx	WBL Ltd	General Foreman	Is consulted by the Project Manager when actioning and rectifying non-conformances. Coordinates dust control on site and vehicle and road cleaning.
JS	JS	xxx xxxxxxx	WBL Ltd	Environmental Engineer	Conducts weekly environmental inspections, Coordinates and carries out toolbox talks on environmental issues. Coordinates water monitoring and maintains records and reports. Coordinates emergency response, including spills. Checks spill kits and orders spill control materials when required. Performs TBTS when required

					Preparation, Monitoring and updating of the CEMP
DOC	DOC	xxx xxxxxxx	WBL Ltd	Engineer/ TMCSO	Ensures that works are carried out in accordance with the EMP, WMP and TMP. Provides a Liaison with the local Stakeholders.
CC	CC	xxx xxxxxxx	WBL Ltd	Section Engineer	Carry out toolbox talks under direction from the Site EHS Officer Ensures that works are carried out in accordance with the EMP and with the approved works method statement. Includes Environmental matters in weekly site inspections.
RC	RC	xxx xxxxxxx	WBL Ltd	QS	Tracks the costs associated with the implementation of the environmental management plan and forwards to the Company Environmental Coordinator as required.
AMC	AMcC	xxx xxxxxxx	WBL Ltd	Engineering Director	To ensure site governance is compliant with legal and other requirements, prevention steps are implemented, and the project displays leadership in environmental concerns.

4.0 ENVIRONMENTAL MANAGEMENT

The environmental management system (EMS) complies with the ISO 14001:2015 standard. Those aspects of the EMS relevant to this project are outlined in this document which also contains references to specific procedures.

4.1 Planning

The environmental planning for the project is based on information from:

1. The Employers project information and tender documentation, in particular the Outline Construction Environmental Management Plan (OCEMP), and Environmental Impact Assessment Report (EIAR)
2. Planning Permission Requirements
3. Schedule of Environmental Commitments.
4. Environmental Mitigation measures
5. Conditions of Industrial Emissions Licence (IEL)

Incorporation of the above requirements into the development of WBL Method Statements for works

4.1.1 Environmental Risk Assessment

During the initial visit to site, notes will be produced which identify any significant environmental aspects. These notes were compared with the environmental information supplied by the client (where applicable) and have been used as a basis for performing the environmental risk assessment.

4.1.2 Environmental Risk Assessment Report

The significance of all the environmental aspects for each activity on the project will be assessed. Please see Appendix C for the Environmental Aspects Report for this project.

4.1.3 Environmental Risk Assessment and Management Controls

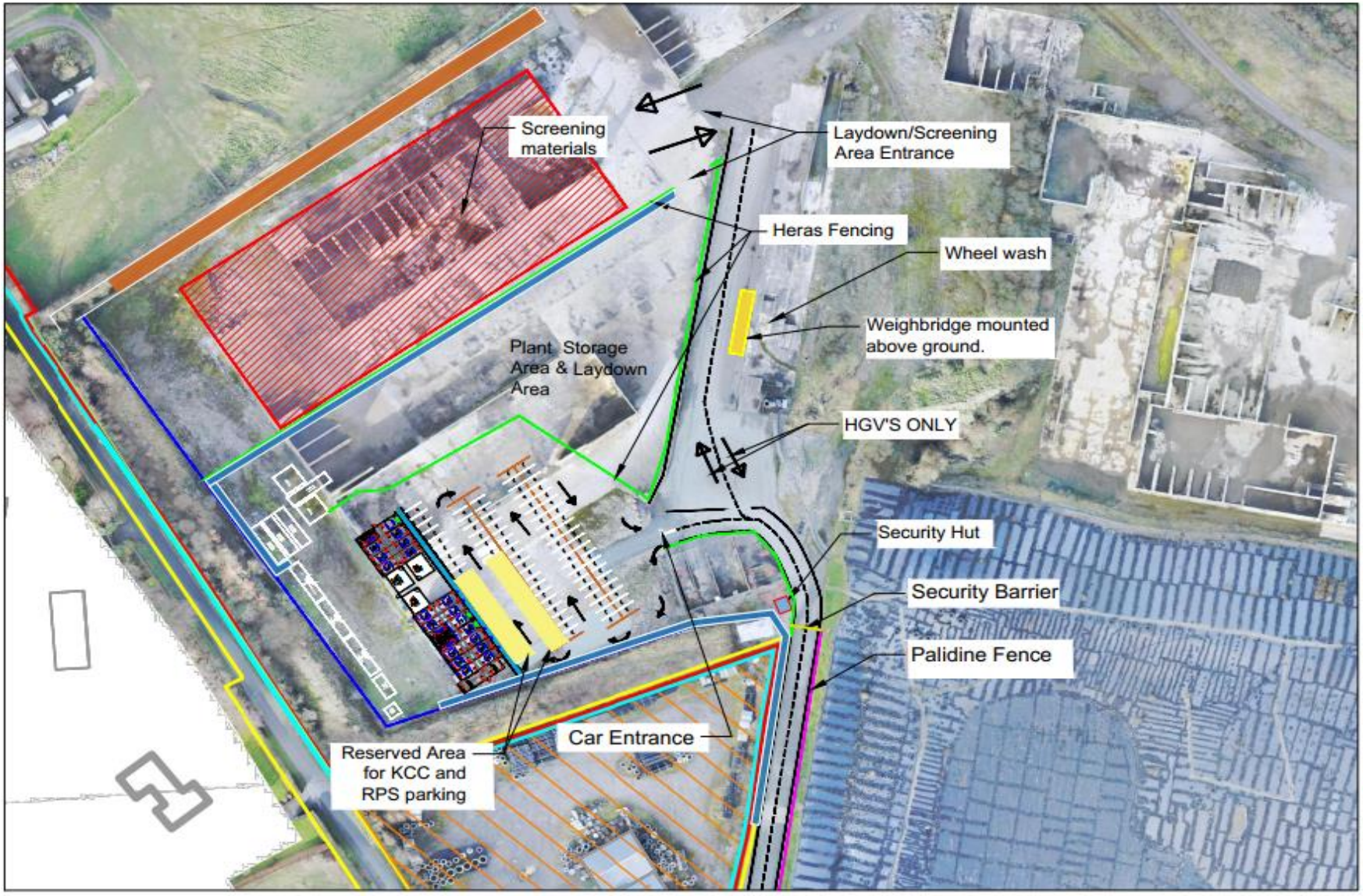
The management controls, which have been put in place, are appropriate to the nature, duration, and scale of the activity on this project and the particular sensitively of the local environment. They will be revised in the event of any significant changes to the scope of the activity during this project, especially when there is additional works, or a change in the method of works. Additional management controls shall be adopted when there are changes to client requirements, stakeholder interests to a particular local environmental sensitivity.

The significant risks which are highlighted in the risk assessment and the management controls are communicated to the workface by site inductions and toolbox talks and in particular through Daily Job Safety Plans and Risk assessment Method Statements (RAMS) for works packages.

Environmental inductions will be carried out online which will complement the CEMP document. This environmental inductions will highlight issues such as, dust, construction noise and vibration, invasive species and badger setts. This online induction document will a requirement for all site personnel to read and sign before commencing works on site.

4.2 Site Specific Construction Layout Plan

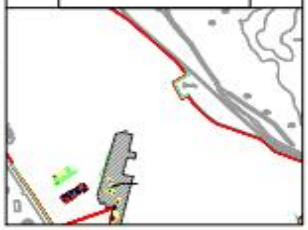
The plan shown below highlights the site-specific construction layout. The layout is subject to alterations as the project progresses but is indicative of site mobilisation.



NOTES.

1. DO NOT SCALE. USE ONLY GIVEN DIMENSIONS.

KEY PLAN



REV.	DATE	DESCRIPTION	APPR.
000		Description	EDK

Wills Bros Ltd

CIVIL ENGINEERING CONTRACTORS

JOB TITLE: KERDIFFSTOWN

DRAWING TITLE: Proposed Compound Layout

DRAWN	JOB NO: KERDIFFSTOWN	REV.
CHECKED	STATUS: INFORMATION	000
APPROVED		
SCALE	DRAWING NUMBER: 001	
DATE		

4.3 Construction Schedule

In consideration of the EIAR, the following phasing of works will be undertaken as tabulated in this section. This CEMP covers the construction phase of the project and applies to all works within the site boundary for the duration of the construction period. It is envisaged that construction works, as part of this Contract, will take place over an approximate 24-month period.

WBL programme will allow for compliance with the conditions of the granted IE licence from the EPA and their ongoing oversight of the licence/agreement with proposed works, legal agreements for land purchase, availability of suitable materials for importation, programme and ecological constraints. Depending on the outcome of these factors a lead-in time for the commencement of remediation works may also be required. The durations are also likely to be subject to weather conditions, which can restrict works. where impacts and nuisance may be prevalent including inclement weather giving rise to surface water runoff, and dust and odour generation through waste excavation works.

Wills Bros Ltd will prepare the construction programme, which may differ or alter slightly. Such alterations will be communicated to KCC Site Manager and agreed so that maintaining compliance with the statutory permissions can be maintained.

Construction Activity	Proposed Timeframe
• **Start Site Demolition Zone 2A** • **Site Clearance Zone 1** • **Site Attendances Around Site** • **Start Tree Felling and De Scrubbing Across Site**	November 2020
• **Finish Demolition Work to Zone 2A** • **Start Demolition Work to Zone 4** • **Start Site Clearance to Zones 1A and 4**	December 2020
• **Start Crush and Screen to Zone 2B** • **Start Demolition Work to Zone 2B** • **Start Earth Work – Cut/Fill to Zone 1, 1A and 4** • **Start Maintenance of Existing Gas Infrastructure Throughout Construction** • **Complete Site Clearance of Landfill Infrastructure Compound Site** • **Start Excavation to Landfill Infrastructure Compound** • **Start Earth Works to Leachate Emergency Storage Tank** • **Start Archaeology Works**	January 2021
• **Start Structural to Treated Leachate Storage Tank and Leachate Treatment Building**	February 2021

• **Complete Foul Pumping Station Works** • **Finish Demolition to Zone 2B** • **Finish Crush and Screen to Zone 2B** • **Finish Cut/Fill Works to Zone 1A** • **Finish Structural Works to Treated Leachate Storage Tank** • **Start Excavation and Installation of Precast to Foul Pumping Station**	
• **Finish Structural works to Treated Leachate Storage Tank** • **Complete Work to Foul Pumping Station** • **Start Finishing Works in the Leachate Treatment Building** • **Start Surface Water to Zone 1** • **Finish Structural Works to Office Building** • **Start Processing of Imported Class 1S and 2S**	March 2021
• **Start Lining and Associated Earthworks to Zone 1 and 1A** • **Start Earthwork and Profiling After Liner to Zone 1 and 1A** • **Service Install – Soakaway Zone 1A** • **Start Surface Water to Zone 1** • **Start Services to Landfill Infrastructure Compound** • **Start Excavation Work to Reedbed** • **Complete Work to Leachate Treatment Building**	April 2021
• **Start Site Clearance to Zone 3** • **Installation of Gas Wells and Well Heads** • **Start Overline Works to Zone 1** • **Start Service Installation to Zone 1A (Surface Water & Comms/Power)** • **Installation of Telemetry and Watermain to Landfill Infrastructure Compound** • **Start connecting pipework and backfill – Reedbed** • **Construct New Foul Head Manhole, Pour and Install Plinth, Installation of Scour Valve – Trenchless Work**	May 2021
• **Start Cut/Fill Works to Zone 3** • **Install Well Heads (8No)** • **Overliner Works to Zone 1A** • **Start Service Installation to Zone 3** • **Finishing Work to Landfill Infrastructure Compound**	June 2021

• **Complete Works to Pipeline to Johnstown – M&E Works and Restatement**	
• **Start Site Clearance Works to Zones 2A and 2B** • **Start Cut/Fill Works to Zone 2** • **Installation of Gas wells and Wells Head (6No each)** • **Power required From SUB DB to Leachate Building DB Works** • **Leachate Compound Finishing Works** • **Commence Works on Redirecting Leachate Pipework going from Existing Zone 3 to Leachate Building**	July 2021
• **Install Gas Wells and Wells Head** • **Install Comms/Power and Leachate Line to Zone 1** • **Finish Lining and Associated Earthworks to Zone 1**	August 2021
• **Start Installation of Gas Line to Zone 1** • **Finish Placing and Compact Class 2S to Zone 1** • **Finish Leachate Lines to Zone 1**	September 2021
• **Start Gas Manifold Installation to Zone 1** • **Finish Gas Lines to Zone 1** • **Installation of Gas Wells 10No** • **Finish Cut/Fill Works to Zone 2** • **Finish Overliner Works to Zone 1**	October 2021
• **Installation of Gas Wells** • **Finish Surface Water in Zone 1** • **Finish Installation of Gas Manifolds Zone 1**	November 2021
• **Install Gas Wells To Zone 3** • **Start Surface Water to Zone 4** • **Start Install precast concrete piles to Changing Rooms Building** • **Finish Cut/Fill works to Zones 3 and 4**	January 2022
• **Start Lining and Associated Earthworks to Zone 3** • **Start Condensate De Watering Lance Dripleg GM11 Area 3** • **Start Surface Water, Leachate and Gas Lines to Zone 3** • **Start Outfall Details Around Ponds/Headwalls/Sensors to Zone 4** • **Start 3m Access Road Asphalt Inc Kerb and Subbase Prep – Zones 1A and 1**	February 2022

• **Start Lining and Associated Earthworks to Zones 2B and 4** • **Completion of Dripleg Chamber GM11 Area 3** • **Start Place and Compact Class 2S Inc Geogrids to Zone 2B** • **Overliner Works to Zone 3** • **Place and Compact Class 2S Inc Geogrids to Zone 4** • **Installation of Watermain, ESB, Gas Manifold to Zone 3** • **Installation of Gas and ESB to Zone 4**	March 2022
• **Start Lining and Associated Earthworks to Zone 2A** • **Overliner Works to Zone 4** • **Start Surface Water to Zone 2B** • **Start Regulation to formation - Pitch C** • **Start Zone 2A Place and Compact Class 2S Inc Geogrids** • **Finish Lining and Associated Earthworks to Zone 2B**	April 2022
• **Start Surface Water to Zone 2A** • **Pitch C - Drainage** • **Start 3m Access Road Asphalt Inc Kerb and Subbase Prep** • **Building walls to Changing Rooms Building** • **Grass and Surface Works to Zone 1A and 1**	May 2022
• **Start Works on Pitches A and B** • **Prep Footpath on Pitch C** • **Start Finishing Works to Zones 3 and 4** • **Finish Lining and Associated Earthworks to Zone 2A** • **Finish Placing and Compact Class 2S Inc Geogrids to Zone 2A** • **Start Watermain, Leachate and Gas Line to Zone 2A** • **Start first fix installations Plumbing/Electrical Finishes to Changing Rooms Building**	June 2022
• **Start Overliner Works to Zone 2A** • **Installation of Lighting and Manifolds to Zone 2A** • **Watermain to Zone 2B** • **Start Power, Leachate and Gas Line to Zone 2B** • **Start Hardscape to Zones 3 and 4** • **Complete External and Internal rendering**	July 2022

• **Finish Surface Water, Gas Manifold Installation, Watermain and Lighting to Zone 2A**	
• **Start Drainage/Surface water and Foul to Access Road** • **Start Power from MDB1 to DB Changing Rooms** • **Start External Lighting/Cameras** • **Overliner Works to Zone 2A** • **Finish Telemetry/Power Ducting/Chambers to Zone 2A** • **Finish Power Ducting, Leachate and Gas Line to Zone 2B**	August 2022
• **Works on Pitches Ongoing** • **Excavation and foundation for Playground Equipment** • **Start Installation of Playground Equipment** • **Excavation and Subbase Layer to Car Park Area** • **Prepare for Kerbing – Main Car Park Area** • **Start Installation of Street Furniture Across Site**	September 2022
• **Telemetry and Power to Access Road** • **Start Leachate and Gas Line to Access Road** • **Excavation and Geotextile installation to Overflow Car Park** • **Start Cabling and Telemetry to Ponds and Outfalls Inc Instrumentation Install** • **Start Construction of stone wall at main entrance** • **Start Road Construction to Sub Station** • **Start Fencing Works**	October 2022
• **Telemetry and Power to Access Road** • **Start Leachate and Gas Line to Access Road** • **Start Finishing Works to Zone 2** • **Start Cabling and Telemetry to Ponds and Outfalls Inc Instrumentation Install** • **Start Construction of stone wall at main entrance** • **Start Road Construction to Sub Station** • **Fencing Works to Zones 1, 1A, 2 and Playground**	November 2022

4.4 Environmental Compliance Requirements

In accordance with this plan, a review of all relevant literature and contractual requirements relevant to the contract has been and will be completed on an ongoing basis. These requirements have been tabulated in Appendix B (IEL P1063-01) to demonstrate how each of the requirements is addressed in the EMP. The schedules from the licence have been included in the appendix which shows the compliance requirements within the licence. WBL will ensure that these compliance requirements will be adhered too, throughout the course of the works.

Evaluation of Compliance

Compliance will be evaluated through Inspections and Audits and also reviewed at the regular site management meetings. A site EHS performance score based on the semi quantitative system of counting weekly Inspection citations requiring actions will form a trend over the course of the works. Inspections are to be completed through the use of iAuditor App on Smart Phone or Tablet. A target score in excess of 90% (average) and 85% in any single inspection requires Senior Management intervention. A higher score is to be commended and score of 85% is considered tolerable on individual inspections.

4.4.1 Consultation with Relevant Authorities

Consultation will be undertaken with the following authorities:

Authorities	Contact Number
Kildare County Council	Ultan Downes/James Mulligan (onsite)
National Parks and Wildlife Service	1890 383 000

4.4.2 Environmental Planning Conditions and Reasoning

In accordance with the planning conditions and reasoning, the following environmental restrictions apply to the construction of the works:

No	Environmental Planning Conditions and Reasoning
1	The proposed development shall be carried out and completed in accordance with the plans and particulars, including the Environmental Impact Assessment Report (EIAR), and other associated documentation, lodged with An Bord Pleanala on the 30th day of August 2017, except as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be prepared by the local authority, these details shall be placed on file prior to commencement of development and retained as part of the public record. **REASON:** In the interest of clarity and the proper planning and sustainable development of the area and to ensure the protection of the environment.
2	The mitigation and monitoring measures outlined in the plans and particulars relating to the proposed development, including those set out in Tables 19.1- 19.13 of Chapter 19 of Volume 2 of the Environmental Impact Assessment Report submitted with this application, shall be implemented in full except as may otherwise be required in any Industrial Emissions Activity Licence (IEAL) issued by the Environmental Protection Agency in respect of the proposed development or as may be required in order to comply with the following conditions. Prior to commencement of development, details of a time schedule for implementation of the mitigation measures and associated monitoring shall be prepared by the local authority and placed on file and retained as part of the public record. **REASON:** In the interest of clarity and to mitigate the environmental effects of the proposed development.
3	Prior to commencement of development, the local authority, or any agent acting on its behalf, shall prepare a Construction and Environmental Management Plan (CEMP) generally in accordance with the commitments set out in the EIAR and as detailed in Table 19.1 of Chapter 19 of same. The CEMP shall include specific proposals as to how the CEMP will be measured and monitored for effectiveness, and it shall be on file prior to the commencement of development and retained as part of the public record. **REASON:** In the interest of protecting the environment, the protection of European Sites and in the interest of public health.
4	Site development and building works shall only be carried out between the hours of 0700 to 1900, Mondays to Fridays inclusive, between 0800 to 1400 on Saturdays and not at all on Sundays or public holidays. Deviation from these times will only be allowed in exceptional circumstances where prior written approval has been received by the contractor from the local authority. **REASON:** In order to safeguard the residential amenities of property in the vicinity.
5	The operational hours of the floodlighting to the sports pitches shall not extend beyond 2200 hours with automatic cut-off of floodlighting at that time. **REASON:** To protect the residential amenity of properties in the vicinity.

4.4.3 Environmental Licences, Permits and Permissions

These are all legal documents associated with the work and will be maintained by the Wills Bros Ltd Management Team on site

Kildare County Council will be requested to supply information pertaining to the licences and permissions that are required for the project. Wills Bros will work in collaboratively with Kildare County Council in maintaining compliance with the licence and permission requirements.

A copy of all formal licences is to be sent to the EHS Department, Foxford, Co Mayo.

The following table indicates the licences/permissions required

Licence / Permission	Regulator	Operations
Industrial Emissions Licence (Reg. No: P1063-01)	EPA	Any work carried out as part of this project will be subject to the conditions set within the granted IE licence.
Discharge consent into watercourse or sewer	Local Authority, Irish Water	Any removal of waste materials from site requires four "numbers" to be supplied and included on the waste register
Waste collection permits and facilities licences		1. A quantity of materials in Kg or M^3 2. EWC code for the waste 3. A WCP waste carrier permit no. & 4. A facility licence number for the destination location.
Permissions / Licences	National Parks and Wildlife Services	Cutting of protected trees. Work involving the disruption to protected species and transportation of invasive species.
Permissions	Kildare County Council	All planning permissions constraints Traffic, Noise, vibration communication via Client's team.

Hours of Work

Under the EPA licence and Planning Conditions, the construction hours are limited to:

- 07:00 to 19:00 Monday to Friday; and
- 08:00 to 14:00 on Saturdays.

There shall be no construction activity permitted on Sundays or public holidays unless with the prior written approval from Kildare County Council or in the case of emergencies or exceptional circumstances.

In advance of any construction works commencing the Contractor shall agree with Kildare County Council the Contractor's proposed hours of construction activities.

4.5 Environmental Control Measures (ECM's)

The following monitoring and mitigation measures will be utilised in order to operate to the Environmental requirements of the project.:

1. Complying with all conditions of the EIAR and IE licence and the limits specified for all environmental monitoring.

2. Monitoring performance against thresholds set out in the planning, EIAR and IE licence i.e. for noise, dust and water.

3. Ensuring adequately trained personnel are available to undertake monitoring should they be requested to do so by the KCC Site Manager.

4. Ensuring that all monitoring is undertaken in accordance with current guidance.

5. Liaising with the specified accredited laboratories and maintain records of results.

6. Managing the chain of custody for all samples and engage with KCC Site Manager prior to issue of samples for testing.

7. Ensuring all monitoring results obtained from laboratories is comprehensively reviewed by the Environmental Manager to identify if any trigger values have been exceeded.

8. Ensuring that all original monitoring results obtained from laboratories are also copied to the KCC Site Manager.

9. Undertaking environmental monitoring transferred from the KCC Site Manager and as specified in the contract.

10. Generating environmental monitoring reports as required to present environmental data trends and incidents, in accordance with best practice and standards

11. Ensuring the compliant disposal of all wastes generated during the remediation phase of the Project and retain records of all hazardous wastes disposed.

12. Ensuring the compliant management and/or disposal of leachate, by authorised waste contractors, during the remediation phase of the proposed project, such that the leachate does not percolate into the ground or is otherwise released in a manner that could have an environmental impact.

13. Undertake visual and monitoring inspections of the surface drainage and sediment control measures as well as watercourses during the remediation phase of the project.

14. Undertake gas mitigation measures during the project.

15. Undertake the overall responsibility for dust management throughout the remediation phase of the project and reporting back results to the KCC Site Manager.

16. Ensure odour incidents are minimised at the site through best practice and daily monitoring, in accordance with the EPA's Air Guidance Note 5 (AG5), throughout the remediation phase of the project.

17. Examination of real time noise monitoring to ensure that noise criteria is met during for the remediation phase works

18. Separate to the real time noise monitoring, undertake noise and vibration monitoring at noise sensitive receptor locations throughout the remediation phase of the proposed Project.

19. Ensuring all mitigation measures identified in Appendix J is implemented.

20. Reviewing the need for noise barriers between the works and identified receptors in proximity to the working area where noise limits are likely to be exceeded.

21. Ensuring works are planned to take place under suitable weather conditions in order to minimise odours.

The ECM's listed below are provided to the site teams as guidance for use in method statements and Toolbox talks and are incorporated into Job Safety plans and training sessions on site. The documents as used on site are available in the site records and will be tailored to site specific requirements and issued accordingly by EHS Officer.

ECM	Title
1	Using Concrete
2	Non-native Invasive Spp. (NnIS)
3	Waste management
4	Incident reporting
5	Nuisance from noise, odour, dust and vibration
6	Using oil and oil products
7	Using chemicals and hazardous substances
8	Storing materials and stockpiling
9	SuDs, Controlling site drainage and runoff waters
10	Excavations
11	Environmental Monitoring
12	Site Inspections and Audits
13	Reuse, Recovery & Recycling
14	Site Inspections
15	Purchasing and materials management
16	Energy efficiency
17	Bats
18	Badgers
19	Otters
20	Trees and Hedgerows
21	Transition areas Ecologically sensitive.
22	Avian and Aquatic species
23	Water Quality

4.5.1 Risk Assessment Method Statements (RAMS)

The significant environmental aspects and the actions to apply the required controls are described in the risk assessment method statements.

RAMS are produced in accordance with the contract requirements by the Site Management Team and reviewed by the Project Managers / Site Agents prior to submission. When developing RAMS, the OCEMP, Environmental Impact Assessment Report, Industrial Emissions Licence, Site Maps, and any other relevant environmental management documents shall be reviewed to assess the potential impacts of the particular activity.

All method statements shall include a section entitled "Environment". For activities that have significant potential to cause adverse environmental impacts. Reference will be made in this section of the RAMS to the Environmental Management control measures in Section 4 of this CEMP. Additional control measures may be included where required to suit the local conditions at the site of the activity, and/or where specific measures are required by any of the authorities.

The RAMS must include consideration of:

1. Reference to the CEMP and WMP phrases
2. The proposed method of construction and how impacts shall be mitigated
3. Waste (storage, removal, end disposal sites, reference to Projects' Zero waste to Landfill objective)
4. Hazardous Substances (storage, removal, and end disposal sites where expected)
5. Works close to waterways (sediment controls if needed where expected)
6. Dust sources
7. Noise and Vibrations
8. Refuelling
9. Invasive Species
10. Fuel storage
11. Drip trays/spill kits and other precautionary measures
12. Sensitive ecological zones specific to the works

4.5.2 Environmental Management Plans

In order to comply with environmental requirements on the project the following plans will be developed and submitted to KCC and the Employers Representative for review and approval. Adherence to the management plans and procedures outlined in each plan will mitigate potential nuisance from construction generated noise, emissions and waste. The plans will implement the conditions set out in Works Requirements, EIAR and the Industrial Emissions License (P1063-01).

1. Groundwater Management Plan (GMP)
2. Odour Management Plan (OMP)
3. Dust Management Plan (DMP)
4. Noise and Vibration Management Plan (NVMP)
5. Invasive Species Management Plan (ISMP)
6. Site Biodiversity Management Plan (SBMP)
7. Erosion and Sediment Control Plan (ESCP)
8. Contaminant Spill Emergency Plan (CSEP)
9. Construction Traffic Management Plan (CTMP)
10. Mobility Management Plan (MMP)
11. Waste and Materials Management Plan (WMMP)
12. Landfill Gas Management Plan (LGMP)
13. Leachate Management Plan (LMP)
14. Surface Water Management Plan (SWMP)
15. Accident and Emergency Response Management Plan.
16. Monitoring and Control Management Plan (MCMP)

These plans are live documents and will be reviewed and updated accordingly as the project progress in agreement with KCC and Employers Rep.

4.5.3 Waste Management Plan

WBL have prepared a Waste Management Plan which deals with the construction and demolition waste on site. This plan incorporates a Waste Acceptance Procedure. The procedure ensures that all waste accepted during the remediation is controlled and handled appropriately and in compliance with the Industrial Emissions License (P1063-01). In the event of uncovering hazardous material during the works, a Hotspot Protocol will be carried which is incorporated in the Waste Management Plan. WBL will ensure that impermeable barriers such as Tarpaulin is to be retained on site for this purpose.

Appreciate signage to be erected in the event of uncovering hazardous materials. WBL will perform necessary testing on materials following identification of the substance in the hotspot. A WAC analysis to be carried out, as necessary.

4.5.4 Dealing with contamination

Refer to contaminant spill emergency, surface water and groundwater management plans on how WBL will deal with leachate and contaminated water. The use of silt fence, silt bags and silt curtains are to utilised during the works, location to be dictated by circumstances on site. Placed as far away from the site boundary to minimise any contamination outside the site boundary and the Morell river. The aim is to contain any possible contamination within the site and these measures are referred too. Chemical spill kit to located at strategic locations on site relevant to the works.

4.5.5 Surface Water Management

Surface Water Management is detailed further in WBL Surface Water Management Plan. The protection of watercourses is of utmost importance and the mitigation measures set out in the plan will help to manage surface water on the site. Temporary ponds are to be constructed, release trenches and attenuation ponds will help to capture surface runoff.

The position of the site haul roads within the site will be planned to ensure that they are fit for purpose and are maintained to in a manner sensitive to the environmental issues relating to the site. It will be the responsibility of the site foreman to check for any signs of deterioration and bring these issues, as soon as possible, to the attention of the site management to further assess.

During the directional drilling phase under then M7, where there is a particular risk of bentonite slurry escaping, this risk needs to be contained through the use of slit fencing and be in place prior to works and installed in line with the manufacturer's guidelines.

4.5.6 Biodiversity and Site Clearance

As stated in the Works Requirements 1/72AR;

Any trees, scrub or hedgerows adjacent to, or within, the Site boundary which are intended to be retained will be afforded adequate protection prior to works commencing. Mitigation measure will be in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b).

The mitigation measures are set out in WBL Site Biodiversity Plan and Invasive Species Management Plan. WBL seek approval from the ER before any tree removal, scrub or hedgerow. All areas to be identified and demarcated with coloured tape. All operatives to be briefed before any removal.

4.5.7 Noise

As stated in the Works Requirements 1/72AR;

Best practice control measures including choice of plant, scheduling of works on Site, provision of temporary acoustic screening, on-site noise monitoring and other measures will be employed in order to ensure noise limits are not exceeded.

WBL will adopt the commitments as stated below in 4.9. Communication will be carried out by WBL Community Liaison Officer, giving notice to KCC and ER regarding works that may cause noise. This could potentially impact local residents in local receptors and this notice to KCC and ER will be vital. WBL will be in consultation with noise and vibration Consultants to ensure noise levels are not exceeded.

4.5.8 Environmental Commitments

WBL are committed to the environmental commitments set out in the Works Requirements 1/72AR. All RAMS will include any environmental aspects to the works. The following commitments will be practiced:

- All operators will be briefed on the environmental sensitivity of the project;
- All plant suitable to the works will be appropriate to the task in each incidence;
- System of works to reflect on environmental controls;
- Works to be supervised at all times.

4.6 Reporting & Documentation (Ref OCEMP)

4.6.1 Monitoring and Checking -Internal Communications

Internal communications relating to environmental issues on the project shall be carried out as part of a routine monthly meeting and reporting schedule.

Contractor Environmental Reporting Requirements

A number of routine environmental reports shall also be generated on an ongoing basis throughout the works by WBL which shall be submitted to the KCC Site Manager. These reports, which shall be written by suitably qualified personnel using agreed templates, are described in **table below.**

Contractor Environmental Reports

Report	Description
Monthly Environmental Progress Reports	A written log of the environmental performance of the works. The report shall summarise environmental events for the period and include details on environmental incidents and complaints, environmental data such as waste and fuel, environmental monitoring details and areas of concern moving forward on the project.
Environmental Monitoring Reports (Monthly)	A summary report containing the details of environmental monitoring for the period on aspects such as water quality, dust, noise.
Environmental Incident Reports	A summary report detailing the cause and extent of a particular environmental incident. The report shall include a description of the remedial measures carried out and any recommendations following the incident to avoid future occurrence.
Environmental Audit Reports	A written log of the findings of environmental audits carried out and the actions required closing out any non-conformances.

Internal Environmental Records

Certain environmental activities and events shall be logged on dedicated records. These records shall be maintained by WBL. These reports are described in **table below.**

Internal Environmental Records

Record Type	Details
Environmental Inspection Record	To be completed when carrying out routine environmental inspections weekly
Environmental Audit Record	To be completed when carrying out routine environmental audits.
Environmental Communication/ Complaints Record	To be completed when any notable environmental communication occurs or on receipt of an environmental complaint.
Environmental Induction/Toolbox Talk Register	To be completed by all staff attending an environmental induction.
Environmental Incident Record	To be completed in the event that an environmental incident occurs.
Waste Management	Details of waste volumes, contractor, and destination.

The significant environmental aspects of the project are monitored monthly **(Appendix I Environmental/Sustainability Report IP041.FM006)**.

4.6.2 Action Register

A record of environmental management actions is to be kept on site. The progress for all actions is reported weekly to the Project Manager and other members of the Management Team. Such actions will include information taken from:

1. Environmental inspections.
2. Audit actions: non-conformances and observations.
3. Progress of actions following environmental incidents.
4. Significant communications with stakeholders.
5. Project issues requiring management action.
6. Complaints.
7. Toolbox talks and communications with workers including “good catch” items.
8. Inductions records count.

These actions will be closed out, signed, and dated by the appropriate supervisor in timely manner.

4.6.3 Performance

Environmental Performance of the project is monitored by:

1. Environmental review meetings as a part of the Weekly Safety Meetings.
2. Site inspections including:
    a. Dust/Noise/ vibration/Water
3. Ecology update.
4. Chemicals/COSHH safety.
5. Oils/spill kits, incidents, and drills update.

6. Any matter arising from interaction with other construction teams, site works teams, security team or local residential complaints.
7. Audits conducted by the EHS Department.
8. Any external auditing body -EPA (other than the client) expected over the course of this job.
9. A review of the quantities of waste created and evidence of reuse.
10. No materials are planned to go to landfill in keeping with the project objective of Zero Waste to landfill, however if it is required, the materials sent to landfill will be minimised. Evidence is provided by transfer notes and checked by truck routing reports and facility weigh in checks.
11. External communications will be through the Clients Representative.
12. Incident feedback and notification will be immediately communicated to Client, EHS and the project team.
13. Review of objectives and targets

4.7 Communications

WBL shall keep KCC and the Employer's Representative informed at least two weeks in advance of all activities that may cause issues for local residents. This shall include works that may involve noise, vibration, and/or odours at those receptors. This will enable KCC to keep the local residents informed and aware of the timing of such activities so as to minimise impacts and avoid nuisance and complaints, where possible.

WBL are committed to informing KCC and the Employer's Representative of any impending works that may cause odour, noise and vibration issues. This will be critical to give this notice to KCC and the Employer's Representative as they can inform the local residents at those receptors.

WBL appoint a Community Liaison Officer (CLO) s nominated contact for any communications in relation to odour, noise and vibration for the duration of the project remediation works and any queries, complaints or other formal correspondence regarding odour, noise and vibration, or other public nuisance.

In agreement with the KCC Site Manager, local residents and stakeholders will be notified before the commencement of any works expected to generate appreciable levels of noise or vibration, explaining the nature and duration of the works.

In addition, WBL shall, in agreement with KCC, distribute information circulars throughout the remediation phase informing people of the progress of works and any likely periods of significant noise and vibration.

4.7.1 Environmental Complaints

All environmental complaints will be recorded in the project Complaints Register. The Register is maintained on site by the Project Manager who also allocates responsibility for resolving any issues and follows up complaints to ensure they are resolved in conjunction with KCC Site Manager. Any issues that are deemed to be significant will be reported to the Employer representative and the relevant authorities as appropriate. Complaints are reviewed during internal audits by the Environmental Co-ordinator, where any additional measures to improve performance are discussed. Complaints are reported to Head Office also. See IP042 Incidents - Complaints Procedures for more details.

All complaints received from external sources and incidents must be reported to:

- The Project Manager (Kevin Doyle who will notify KCC Site Manager).
- EHS (Peter Quigley) or via EHS Dept if not contactable immediately.
- Immediately communicated to the Client's Representative team and Site Project team.
- Logged on Environmental Complaints register (Date and time; Action taken)

4.7.2 Environmental Incidents

Environmental incidents are categorised in terms of: Major; Minor or as an Observation.

Major environmental incident is any situation which has resulted in **significant pollution risk** requiring high levels of resources for response and remedy and must therefore be reported to Site/Company Management, the Client and or any relevant statutory authority.

Minor environmental incident is any situation which has resulted in **environmental pollution risk which required minimal action** to aid recovery from Site/Company Management.

The definition of observation is not included and refers to an encouraging comment based on the observers witness in the normal understanding of the word.

The Site EHS Advisor shall:

- Inform Site Management Team.
- Environmental Specialist to be notified (if applicable).
- Report Environmental Incident immediately to the Environmental Department.
- Investigate and issue reports on environmental incidents (using the Incident Report Form – Dangerous Occurrences / Near Misses / Environmental Incident); and
- Advise the Site Agent on corrective actions (where necessary).
- Log the incident in the Incidents Register as ENV type.

WBL will ensure that an exceedance of licence trigger values will be reported immediately to the KCC Site Manager

EPA

All communications with the EPA will be through KCC. WBL will not engage with EPA unless directed otherwise by KCC.

REPORT ALL ENVIRONMENTAL INCIDENTS IMMEDIATELY TO THE EHS DEPARTMENT 094 9256221.

4.7.3 Suppliers and Subcontractors

Subcontractors will be required to work in accordance with WBL Contractors Environmental Management Plan (CEMP). Works operations will be managed by the relevant Project Managers / Site Agents to ensure appropriate procedures are being followed. WBL must ensure our Subcontractors comply with our Environmental Policy, our EMS and work within the Environmental Legal Framework while working on the project.

Lines of communication would also be outlined during this recruitment stage to ensure they were aware of our environmental management system and how this will affect them and what they need to achieve in order to be suitable candidates for our Projects.

A subcontractor appraisal form is in use and can be accessed through COINS (site financial reporting package). This document will be used to ensure subcontractors who do not satisfactorily meet their environmental obligations are not permitted on any future WBL sites.

Details of subcontractors will be Provided to the Employer's Representative on an ongoing basis throughout the construction of the scheme.

Suppliers and sub-contractors will be made aware of the company's environmental requirements. Where it is possible that a supplier could produce waste or pollution for example in the delivery of fuel oil a WBL employee must supervise the individual delivery of environmental hazardous materials.

Where regular deliveries are anticipated the requirement for supervision will not apply where the competency of the delivery driver is demonstrated.

*See Site QS for site specific information for Supply chain information.

Wills Bros will ensure that a recording system is in place for all incoming and outgoing deliveries to the site through site security.

4.7.4 Liaison with The Public

- WBL will seek appointment of an **experienced site based Public Liaison Officer (PLO)** to establish channels of communication and work with KCC representative/s to proactively engage with the Community Liaison Group, local residents and any other people sensitive receptors.

- Issue an **advance project notification leaflet** to local residents and other people sensitive receptors outlining the proposed works phasing plan, any likely temporary impacts and contact details for our PLO.

- Establish a **project email address** and advertise this on our project information board to enable local residents and other people sensitive receptors to raise queries during the project.

- Establish a **project telephone number** and advertise on our project information board to enable local residents and other people sensitive receptors to raise queries during the project.

- Submit **monthly project update information** to KCC for review and publishing in the Community Updates on existing project website.
  http://kildare.ie/countycouncil/KerdiffstownPark/index.html

- Our PLO will attend any **project public meetings** held with KCC representative/s for local residents and other people sensitive receptors updates where his/her attendance is required

- Local residents notified before **commencement of any particular works** during the Project which could potentially generate appreciable levels of noise or vibration or where adverse metrological conditions coincide with works phasing that cannot be averted heighten risk of short-term odour nuisances.

- Implementation of **Considerate Constructor Scheme** (CCS) to drive proactive engagement and positive impression with local community. The benefit of registering to CCS is our measures to build and maintain a positive impression will be independently assessed under the five main CCS assessment headings which includes ‘Respecting the Community.’ These assessments will provide performance feedback and will identify possible improvements through the independent assessor’s audit report at various stages of the Project.

4.8 Control of Documents

All documents relevant to the construction works shall be kept and stored in accordance with the below table. Documents that are part of the site environmental management system, including inspection reports, monitoring records and meeting minutes shall be kept for the duration of the project as per ISO14001:2015 accreditation scheme.

No.	Document	Raised By	Retained By	Statute or ISO	Currently Held	Retention times (years)
1	Register of Environmental Aspects	Env Co-ordinator	Env Co-ordinator	ISO14001	Head Office and Sites	3
2	Waste Transfer notes (where applicable)	Haulage Contractor	Env Co-ordinator Site	Statute	Sites	3
3	Consignment Notes (hazardous waste)	Hazardous Waste Contractor	Env Co-ordinator Site	Statute	Sites	3
4	Waste Collection Permits	Local Authority	Env Co-ordinator	ISO14001	Sites	Period of validity +1
5	Waste Facility Permits/Licences	Local Authority/EPA	Env Co-ordinator	ISO14001	Sites	Period of validity +1
6	Energy Monitoring Records (hours plus equipment rating)	Env Co-ordinator	Env Co-ordinator	ISO14001	Head Office and Sites	3
7	Water Monitoring Records (Meter reading)	Env Co-ordinator	Env Co-ordinator	ISO14001	Sites	3
8	Local Authority / Environmental Protection Agency Licences	Local Authority / EPA	Env Co-ordinator	ISO14001	Sites	Period of validity + 1
9	Environmental communication from external sources	External	Env Co-ordinator	ISO14001	Sites	3
10	Audit Reports	Env Co-ordinator	Env Co-ordinator Head Office	IP IMS	Head Office and Sites	3
11	Corrective Action Forms	Env Co-ordinator	Env Co-ordinator Head Office	IP IMS	Head Office and Sites	3
12	Env N/C or Env Incident Report	Any member of staff	Env Co-ordinator Head Office	IP IMS	Head Office	3
13	Water treatment log sheets	Designated Site Staff	Site Staff	IP IMS	Site	3

14	Calibration Certificates	External testers	Site Staff/ Env Coordinator	Statue	Site	3
15	Environmental Management Plans	Site Staff	Site Staff	IP IMS	Sites	3
16	Waste Management Plans	Site Staff	Site Staff	IP IMS	Sites	3
17	Environmental Risk Assessment	Env Co- ordinator	Env Co-ordinator and EHS Officer	TII Best Practice	Head Office	3

Controlled documents will be:

a. Reviewed at least annually and updated as appropriate.
b. Marked as superseded once obsolete or destroyed.
c. Dated and marked with dates of revisions.

5.0 ENVIRONMENTAL TRAINING AND COMMUNICATIONS

The environmental management goals and strategy shall be communicated to all staff and contractors at the safety and environmental induction. All employees and contractors are required to undertake an Online induction prior to conducting any work on site (for further details refer to the Health and Safety Plan) and employees shall be made aware of their responsibilities in accordance with this management plan. A record of inductions shall be kept by the Safety, Health & Environmental Register (IP011).

5.1 Environmental Induction

All project personnel shall receive an environmental induction before commencing work on the project. All project personnel shall receive an environmental induction on a scale relevant to their work activities. All visitors to the site shall also receive an environmental induction. On completion of the induction, the inductees shall obtain an online certificate to provide a record of their attendance of the induction. Visitors shall not be allowed onto the site unless they have received formal induction or are accompanied by an authorised person who has completed the induction. All visitors shall be required to sign a visitor's book.

During the environmental induction, the contents and requirements of the method statements and CEMP shall be explained and discussed as well as any additional environmental requirements. The environmental induction programme shall cover the following aspects as a minimum:

- Organisation structure for the construction stage of the project.
- That all personnel in the organisation must be aware of their personal responsibilities for environmental matters.
- That key individuals on-site have specific responsibilities to the environment.
- That the environmental induction forms the basic training on the project and that it shall be followed up with further environmental training as the need arises.
- That all the relevant environmental information shall be given before any job to enable the task to be carried out in an environmentally sound manner.
- That regular communication shall be made via site signage and regular toolbox talks.
- **Employee Responsibilities**: That all employees are responsible for their acts and omissions and shall be held accountable if their actions result in environmental harm.
- **Waste Management:** That the project culture is waste minimisation, reuse and recycling. Waste management policies for the project shall be explained.
- **Surface Water Management and Spill Control:** That surface water management and spill management are very high priorities in all site-based job activities.

- **Control of Nuisance:** That noise and dust require particular control measures to minimise impact on the surrounding environment.

- **Emergency Response Procedures:** That the procedure, if safe to do so is: STOP, CONTAIN, NOTIFY in the case of an environmental emergency on-site.

- **Environmental Incident and Near Miss Reporting:** That environmental incidents, such as loss of containment, shall be reported immediately to the Contractor to identify the cause.

- **Environmental Complaints:** That a specific procedure is in place to deal with environmental complaints and that every assistance shall be provided to close out any active complaint.

- **General Environmental Good Practice:** Materials management, storage, site upkeep, maintenance, handling and refuelling of plant and machinery.

Following induction all personnel shall familiarise themselves with their place of work and the environmental responsibilities associated with their position. If there are any uncertainties the employee shall contact the site management for clarification.

5.2 Recommended Toolbox Talks

Toolbox talks will be conducted with relevant employees on various aspects of the environmental management plan, activity control measures and environmental procedures. Three toolbox talks on environmental or waste issues will be conducted fortnightly.

Toolbox talks shall be conducted by the Site EHS Officer, Section Engineers or others nominated by the Site EHS Officer. The schedule for toolbox talks shall be at the discretion of the Site Management Team and additional toolbox talks will be given in response to complaints, or where the particular environmental risks have been identified.

Environmental toolbox talks shall include the following;

- Spill Control;
- Identification of Invasive Species;
- Storage and Handling of Waste;
- Noise;
- Control of Dust;
- Refuelling.

Toolbox Talk Topic	Reference Material	When*	Recipients
Environmental Management	Environmental Policy, EMP, Environmental Procedures Manual	Commencement of site activities	All site crews
TBT 01	Run off and pollution protection	Initial	All site crews
TBT 02	Ecological Awareness	Initial	All site crews
TBT 03	Zero Waste	Initial	All site crews
TBT 04	Badger Setts	Initial	All site crews
TBT 05	Spill Control	Regular Intervals	All site crews
TBT 06	Waste Pollution Prevention (Fuel & Oil)	Regular Intervals	All site crews
TBT 07	Silt Management	Regular Intervals	All site crews
TBT 08	Fire, spills and other drills	Regular Intervals	All site crews
TBT 09	Storage on Site	Regular Intervals	NA
TBT 10	Japanese Knotweed and other NnIS.	Regular Intervals	NA
TBT 11	Chemical & Fuel on site	Regular Intervals	All site crews
TBT 12	Trees	Regular Intervals	NA
TBT 13	Water on Construction Sites	Regular Intervals	All site crews
TBT 14	Noise Nuisance Control	Regular Intervals	All site crews
TBT 15	Vibration and dilapidation	Regular Intervals	All site crews
TBT 16	Working in stream	Regular Intervals	All site crews

5.3 Environmental Labelling and Signage

Environmental labelling and signage shall be used on site to inform personnel of key environmental requirements and restrictions pertaining to pre-construction enabling activities and to provide information to assist environmental good practice across the site. Environmental aspects such as the following shall be included: -

- Site environmental rules.
- Environmentally sensitive areas.
- Waste storage facilities/containers.
- Speed restrictions.
- Monitoring locations.
- Spill kits for emergency response.

WBL shall ensure that all necessary environmental labelling and signage is put in place. The Site Environmental Engineer will be responsible for this action.

5.4 Specific Environmental Training

WBL plan to carry out some specific Environmental training. This will include a spill kit emergency drill. This would take place in the form of an onsite demonstration if a spill was to occur on site. All site personnel would be required to attend this training and sign a document to confirm attendance. Irish Biotech System will inform all site personnel of the Landfill Gas System during the works.

WBL will maintain awareness through constant engagement with the works teams.

5.5 Environmental Incidents

An incident on-site shall be defined as:

- An emergency.
- Any emission which does not comply with the requirement of the IE licence.
- Any trigger level specified in the licence which is attained or exceeded.
- Any indication that environmental pollution has, or may have, taken place.

In the event of an incident arising on site, WBL shall: -

- Notify the KCC Site Manager/Employer's Representative and KCC of the incident as soon as it occurs.

- Carry out an investigation to identify the nature, source and cause of the incident and any emission arising therefrom.

- Isolate the source of any such emission.

- Evaluate the environmental pollution if any caused by the incident.

- Identify and execute measures to minimise the emissions/malfunction and the effects thereof.

- Identify the date, time, and place of the incident.

6.0 MONITORING & AUDIT

6.1 Monitoring

The following parameters shall be monitored during the construction works.

Dust monitoring will take place at specified locations in the vicinity of works.

Visual inspections of surface water quality are undertaken daily by the Site Safety Officer or Site Foreman. Stock levels of spill kits will be checked by the Site Safety Officer and extra kits ordered as required.

Monitoring of Noise and vibrations at will also take place as required

Monitoring shall also include monitoring of incidents that may impact on ecological receptors.

6.2 Evaluation of Compliance

Environmental legislation relevant to the construction works is summarised in the Legislative Review held by the Environmental Co-ordinator of WBL in Head Office in Foxford. Acts and Regulations that specify requirements for particular environmental issues during the site works are noted in the Environmental Risk Assessment for the project, attached in Appendix C.

Compliance will be evaluated through Inspections and Audits and also reviewed at the regular site management meetings.

6.3 Inspections

The Site Health, Safety & Environmental Officer is responsible for inspecting and reviewing operations to ensure compliance with the CEMP. Environmental and waste control measures are also included as part of the Foreman's and EHS Officer's weekly checklist and the Project Manager's monthly inspection.

In addition, the following will be undertaken during the weekly inspection:

Inspection of land and watercourses for visible signs of pollution by solids or oil.

Observance of black smoke from plant and vehicles.

Non-conformances shall be actioned and rectified in consultation with the General Foreman, with advice from the Company Environmental Co-ordinator as required. The effectiveness of corrective actions taken shall be evaluated during subsequent inspections by the Environmental Representative, who will also determine whether additional toolbox talks on specific issues are required to minimise potential for recurrence. Non-conformances and corrective actions are reviewed at the monthly environmental management meeting as detailed below.

6.4 Audit

An audit of the CEMP and procedures will be conducted by the Environmental Co-ordinator at least every 6 months. Additional audits shall be carried out by the EHS Officer at least monthly. The results of the audit shall be given to the Project Manager, who will update the EMP and other associated documents. Non-conformances shall be actioned and rectified by the Project Manager in consultation with KCC and the General Foreman, with advice from the Company Environmental Co-ordinator as required.

7.0 MANAGEMENT REVIEW

The implementation of the EMP is reviewed monthly on site at the internal site meetings. These meetings are attended by site management and by personnel responsible for the implementation of the EMP. During the meeting, all aspects of the environmental management are considered, including:

1. Upcoming work
2. Environments risks foreseen
3. Control measures for the protection of the environment
4. Internal and external audit results
5. Inspection and monitoring results.
6. Environmental alerts and bullet-ins.
7. Any issues raised by site staff or in relation to environmental management
8. Site goals and targets
9. Control measures for protection of the environment
10. Any other significant issues.

Changes are made to the on-site management as required to achieve a continual improvement in environmental performance.

Environmental issues will be brought to the attention of the workforce through toolbox talks and through the Monthly EHS Meeting.

The CEMP itself shall be reviewed at least every three months by the Site Management Team to ensure that it continues to be adequate and effective and changes made as required. Any changes shall be made by the Site EHS Officer and a new revision of the CEMP issued to all personnel on the circulation list of this document.

Appendix A - Table of Requirements for ISO14001

	ISO14001	EMP	Section
4.2	Environmental Policy	Company Environmental Policy	Appendix D
4.3.1	Environmental aspects	Site Environmental Risk Assessment	5
4.3.2	Legal and other requirements	Relevant Statutory Provisions	6.5
		Contract Requirements	Appendix B
4.3.3	Objectives, targets, and programmes	Environmental Management Goal	7
4.4	Implementation and operation	Strategy to Achieve this Goal	1.1
4.4.1	Resources, roles, responsibility, and authority	Organisation & Responsibilities	2.1
4.4.2	Competence, training, and awareness	Training and competence	10
4.4.3	Communication	Environmental Management Strategy	3.2
4.4.4	Documentation	Environmental Management Documents	8
4.4.5	Control of documents	Control of Documents	6.7
4.4.6	Operational control	Environmental Control Measures	8
4.4.7	Emergency preparedness and response	Environmental Control Measures	4
4.5	Checking	Monitoring and Audit	3.1.2
4.5.1	Monitoring and measurement	Monitoring	3.1.2
4.5.2	Evaluation of compliance	Evaluation of compliance	6
4.5.3	Nonconformity, corrective action, and preventative action	Inspections	3.1.2
4.5.4	Control of records	Control of Documents	6.7
4.5.5	Internal audit	Audit	3.2.1
4.6	Management review	Management Review	9

Appendix B – IEL Licence P1063-01

(Schedules within Licence)

SCHEDULE A: Limitations

A.1

The following waste related processes are authorised:

- Re-grading and re-profiling of deposited waste
- Making safe over-steep slopes
- Excavation and re-deposit of waste
- Movement of waste stockpiles
- Treatment of waste, e.g. crushing, screening and preparation for reuse in remediation works
- Extraction, collection and flaring of landfill gas
- Extraction, collection and dispatch for disposal of leachate
- Processes for the management and mitigation of environmental emissions
- Construction of impermeable cap and installation of drainage network
- Use of imported waste in construction of engineered cap and soil cover systems
- Maintenance and aftercare activities

No additions to these processes are permitted unless agreed in advance with the Agency.

A.2 Waste Acceptance

Table A.2 Waste Categories and Quantities

LoW Code	Waste Type [Note 1]	Maximum (Tonnes)
01 04 08	Gravel and crushed rocks for use in drainage layers or aggregate backfill, tracks and as general engineering fill.	190,000
01 04 09	Sands and clays for use in regulating layer below capping system.	
17 05 04	Soils and stones for use in the tracks, restoration layer and bunds construction.	
17 05 06	Dried material for use in regulating layer below capping system.	
19 13 02	Soils from soil remediation processes for use in restoration layer and bunds construction.	
20 02 02	Soils and stones for use in restoration layer and bunds construction.	
Total		190,000 [Note2]

Note 1: Other inert wastes may be accepted for remediation purposes if agreed by the Agency.

Note 2: Based on approximate breakdown of 127,500m^3 for waste codes at approximate 1.5 tonnes per cubic metre conversion. This maximum may be exceeded, subject to the Agency's agreement if the licensee demonstrates through measurements that the density is greater than 1.5.

SCHEDULE B: Emission Limits

B.1 Emissions to Air

B.1.1 Emission Limit Values for Landfill Gas Flare:

Emission Point Reference Numbers:	A1	A2	A3	A4
Maximum volume to be emitted:	250 m^3/hr	500 m^3/hr	600 m^3/hr	250 m^3/hr
Minimum discharges height above ground level (unless otherwise agreed by the Agency):	8m	8m	11m	11m

Parameter	Emission Limit Value
CO	50 mg/m^3
Nitrogen oxides (as NO_2)	150 mg/m^3

B.1.2 VOC Limits for Passive Vent Trenches:

Emission Point Reference Numbers: A5, A6 and A7

Parameter	Emission Limit Value
VOCs	<100 ppmv Note 1

Note 1: Measured by walkover survey using FID.

B.1.3 Landfill Gas Concentration Limits:

(Measured in any building on or adjacent to the installation and perimeter boreholes)

Parameter	Level
Methane	20 % LEL (1% v/v)
Carbon Dioxide	1.5 % v/v

B.1.4 Dust Deposition Limits

Level (mg/m^2 /day) Note 1
350

Note 1: 30 day composite sample with the results expressed as mg/m^2/day.

B.2 Noise Emissions

Daytime dB $L_{Ar,T}$ (30 minutes)	Evening time dB $L_{Ar,T}$ (30 minutes)	Night-time dB $L_{Aeq,T}$ (15-30 minutes)
55	50	45 Note 1

Note 1: There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise-sensitive location.

B.3 Emissions to Water

Emission Point Reference No: SW1
Name of Receiving Waters: River Morell
Location: 291683E; 222095N
Volume to be emitted: Maximum in any one day: 4,412.45 m^3
Maximum in any one hour: 183.85 m^3

Parameter	Emission Limit Value Note 1
Temperature	25 °C (max)
pH	6 - 9
Toxicity	10 TU
	mg/l
BOD	5
Suspended Solids	10
Ammonia (as N)	0.2
Orthophosphate (as P)	0.1

Note 1: Emissions limit values are required for the duration of the remediation phase. Thereafter, trigger levels shall be established in accordance with Condition 6.14 of this licence.

B.4 Emissions to Sewer

Emission Point Reference No: SE1
Location: 291708E; 221739N
Volume to be emitted: Maximum in any one day: 60 m^3
Maximum rate per hour: 6 m^3

Parameter	Emission Limit Value	
Temperature	30 °C (max)	
pH	6 – 8.5	
	mg/l	kg/day
BOD	1,000	60
COD	5,000	300
Total Nitrogen	2,000	120
Chloride	3,000	180
Sulphate	100	6
Total Metals (Cd, As, Zn, Cu, Cr, Pb, Se, Hg)	2	0.12
Cadmium	0.005	0.0003
Chromium	0.5	0.03
Copper	0.5	0.03
Lead	0.05	0.003
Zinc	0.5	0.03
Nickel	0.5	0.03
Mercury	0.001	0.00006
Silver	0.5	0.03
Methane	0.14	

SCHEDULE C: Control & Monitoring

C.1.1. Control of Emissions to Air

Emission Point Reference No: A1, A2, A3 and A4
Description of Treatment: Gas extraction and flaring

Control Parameter	Monitoring	Key Equipment [Note 1]
Extraction	Continuous with alarm/call-out	Pressure gauge or equivalent approved Pumps/engines
Continuous burn	Continuous with alarm/call-out	Flame detector or equivalent approved Pumps/engines

Note 1: The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.

C.1.2. Monitoring of Landfill Gas Emissions

Locations: Landfill Gas Perimeter Boreholes

Parameter	Monitoring Frequency	Analysis Method [Note 1]/Technique [Note 2]
Methane (CH_4)	Monthly	Infrared analyser/flame ionisation detector
Carbon Dioxide (CO_2)	Monthly	Infrared analyser/ flame ionisation detector
Oxygen (O_2)	Monthly	Electrochemical cell
Atmospheric Pressure	Monthly	Standard Method
Temperature	Monthly	Standard Method

Note 1: All monitoring equipment used should be intrinsically safe.
Note 2: Or other method/technique agreed in advance by the Agency.

C.1.3. Monitoring of Landfill Gas Flare

Emission Point Reference No: A1, A2, A3 and A4

Parameter	Flare Monitoring Frequency	Analysis Method [Note 1]/Technique [Note 2]
Inlet		
Methane (CH_4) % v/v	Continuous	Infrared analyser or equivalent approved
Carbon dioxide (CO_2) % v/v	Continuous	Infrared analyser or equivalent approved
Oxygen (O_2) % v/v	Continuous	Electrochemical or equivalent approved
Total Sulphur	Annually	Ion chromatography
Total Chlorine	Annually	Ion chromatography
Total Fluorine	Annually	Ion Selective Electrode
Process Parameters		
Combustion Temperature	Continuous	Temperature Probe/datalogger
Outlet		
CO	Continuous	Flue gas analyser/datalogger or equivalent approved
NOx	Biannually	Flue gas analyser or equivalent approved
SO_2	Biannually	Flue gas analyser or equivalent approved
TOC	Annually	Flame ionisation
Hydrochloric acid	Annually	Impinger /Ion Chromatography
Hydrogen fluoride	Annually	Impinger /Ion Chromatography

Note 1: All monitoring equipment used should be intrinsically safe.
Note 2: Or other methods agreed in advance by the Agency.

C.2.1. Control of Emissions to Water

Emission Point Reference No: SW1
Name of Receiving Waters: River Morell
Description of Treatment: Settlement ponds, silt trap, oil interceptor

Control Parameter	Monitoring	Key Equipment [Note 1]
Residence time and flow restriction	Flow rate, depth	Flow Meter
Siltation	Silt levels in settlement ponds	As agreed

Note 1: The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.

C.2.2. Monitoring of Emissions to Water

Emission Point Reference No: SW1

Control Parameter	Monitoring Frequency	Key Equipment/Technique
Flow	Continuous	On-line flow meter with recorder
Temperature	Continuous	On-line temperature probe with recorder
Visual Inspection/Odour Note 1	Daily	Sample and examine for colour and odour
pH	Continuous	pH electrode/meter with recorder
TOC	Continuous	On-line TOC meter with recorder
Chemical Oxygen Demand	Weekly during remediation works, monthly thereafter Note 1	Standard Method
Biochemical Oxygen Demand		Standard Method
Suspended Solids		Standard Method
Nitrates (as N)	Monthly during remediation works, quarterly thereafter Note 1	Standard Method
Ammonia (as N)		Standard Method
Total Phosphorus (as P)		Standard Method
Phenols		Standard Method
Metals (specify)		Standard Method
Toxicity Note 2	As may be required	To be agreed by the Agency

Note 1: The licensee shall install a composite sampler. All samples thereafter shall be collected on a 24 hour flow proportional composite sampling basis.

Note 2: The number of toxic units (Tu) = 100/x hour EC/LC_{50} in percentage vol/vol so that higher Tu values reflect greater levels of toxicity. For test regimes where species death is not easily detected, immobilisation is considered equivalent to death.

C.3.1. Control of Emissions to Sewer

Emission Point Reference No: SE1
Description of Treatment: Treatment/abatement control

Control Parameter	Monitoring	Key Equipment Note 1
pH	Continuous Monitoring	pH Probe with Recorder
Temperature	Continuous Monitoring	Temperature Probe with Recorder
Flow	Continuous Monitoring	Flow Meter with Recorder Onsite Balance Tank
Methane Removal	Quarterly	Methane Scrubber System

Note 1: The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.

C.3.2. Monitoring of Emissions to Sewer

Emission Point Reference No: SE1

Parameter	Monitoring Frequency [Note 1]	Analysis Method /Technique
Flow to sewer	Continuous	On-line flow meter with recorder
Temperature	Continuous	On-line temperature probe with recorder
pH	Continuous	pH electrode/meter and recorder
Conductivity	Monthly	Standard Methods
Chemical Oxygen Demand	Monthly	Standard Methods
Biochemical Oxygen Demand	Quarterly	Standard Methods
Suspended Solids	Quarterly	Standard Method
Total Nitrogen	Quarterly	Standard Methods
Ammonia (as N)	Quarterly	Standard Methods
Total Phosphorus (as P)	Quarterly	Standard Methods
Chloride	Quarterly	Standard Methods
Sulphide	Quarterly	Standard Methods
Sulphate	Quarterly	Standard Methods
Full Metal Suite	Biannually	Standard Methods
Respirometry	Once off, then as required	Standard Methods
Phenols	Annually	Standard Methods
VOCs and SVOCs	Annually	Standard Methods
Pesticides	Annually	Standard Methods
PAHs	Annually	Standard Methods
Methane	Quarterly	Standard Methods

Note 1: The licensee shall install a composite sampler within three months of the date of grant of this licence. All samples excluding those for pH and temperature shall be collected on a 24 hour flow proportional composite sampling basis.

C.4.1 Control of Emissions to Ground

Emission Point Reference Number:	G2	G3	G4
Description of Treatment:	Attenuation prior to percolation in soakaway	No treatment	No treatment

Control Parameter	Monitoring	Key Equipment [Note 1]
Residence time and flow restriction	Flow rate, depth	Flow Meter
Siltation	Silt levels in settlement ponds	As agreed

Note 1: The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.

C.4.2 Monitoring of Emissions to Ground

Emission Point Reference Number: G2, G3 and G4

Control Parameter	Monitoring Frequency	Key Equipment/Technique
Visual Inspection/Odour	Daily	Sample and examine for colour and odour
Flow	Continuous	On-line flow meter with recorder
Temperature	Continuous	On-line temperature probe with recorder
pH	Continuous	pH electrode/meter with recorder
TOC	Continuous	On-line TOC meter with recorder
	GW2 only	
Suspended Solids **Ammonia (as N)** **Phenols**	Monthly during remediation works, quarterly thereafter [Note 1]	Standard Method

Note 1: The licensee shall install a composite sampler. All samples thereafter shall be collected on a 24 hour flow proportional composite sampling basis.

C.5 Noise Monitoring

Location: N1 to N8, as indicated in Drawing No. 32EW5604-807 P2 (Fig 8.1 of EIAR)

Period	Minimum Survey Duration
Daytime	A minimum of 3 sampling periods at each noise monitoring location [Note 2]
Evening-time	A minimum of 1 sampling period at each noise monitoring location.
Night-time [Note 1]	A minimum of 2 sampling periods at each noise monitoring location.

Note 1: Night-time measurements should be made between 2300hrs and 0400hrs, Sunday to Thursday, with 2300hrs being the preferred start time.

Note 2: Sampling period is to be the time period T stated as per *Schedule B.2 Noise Emissions* of this licence. This applies to day, evening and night time periods.

C.6 Groundwater Monitoring

Location: Groundwater wells as shown on Drawing No. 32EW5604-00-057 of the licence application

Parameter [Note 1]	Monitoring Frequency [Note 2]	Analysis Method/Techniques
Visual Inspection/Odour [Note 3]	Daily	Standard Methods
Groundwater Level (wells)	Weekly	Standard Methods
Conductivity	Monthly	Standard Methods
Ammoniacal Nitrogen	Monthly	Standard Methods
Chloride	Monthly	Standard Methods
Sulphate (SO_4)	Monthly	Standard Methods
Metals/non-metals [Note 4]	Quarterly	Standard Methods
Phenols	Monthly	Standard Methods
Pesticides (to include mecoprop)	Monthly	Standard Methods
TOC	Monthly	Standard Methods
Nitrate	Biannually	Standard Method
Total Phosphorous/Orthophosphate	Biannually	Standard Method
Relevant Hazardous Substances [Note 5]	Biannually	Standard Method

Note 1: All the analysis shall be carried out by a competent laboratory using standard and internationally accepted procedures.
Note 2: Alternative monitoring frequency may be agreed by the Agency.
Note 3: Where there is evident gross contamination, additional samples should be analysed and the full suite of parameters shown tested.
Note 4: Metals and elements to be analysed should include as a minimum: boron, cadmium, calcium, chromium (total), copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, arsenic and zinc.
Note 5: The relevant hazardous substances for monitoring in groundwater shall be those identified in the baseline report submitted with the application, or as otherwise may be agreed or directed by the Agency.

C.7 Soil Monitoring

Monitoring Location: At locations to be agreed by the Agency

Parameter	Monitoring Frequency	Analysis Method/Techniques
Relevant hazardous Substances [Note 1]	3 years	Standard Method

Note 1: The relevant hazardous substances for monitoring in soil shall be those identified in the baseline report submitted with the application, or as otherwise may be agreed or directed by the Agency.

C.8 Ambient Monitoring

C.8.1 Dust and Odour Monitoring

Location: Dust: D1 to D10, as indicated in Drawing No. 32EW5604-806 P1 (Fig 7.2 of EIAR)
Odour: At locations to be agreed by the Agency

Parameter	Monitoring Frequency	Analysis Method/Technique
Dust deposition	Monthly during remediation phase	Standard Method [Note 1]
Odour	Monthly during remediation phase Quarterly thereafter	[Note 2]

Note 1: Standard method VDI2119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Engineering Institute). Any modifications to eliminate interference due to algae growth in the gauge should be reported to the Agency.
Note 2: To be agreed by the Agency.

C.9 Receiving Water Monitoring

Location: SWM1 (River Morell – upstream of SW1)
SWM2 (River Morell – downstream of SW1)

Parameter	Monitoring Frequency [Note 1]	Analysis Method/Techniques
Biological Quality (Q) Rating/Q Link	Annually	To be agreed by the Agency
Visual inspection	Weekly	Sample and examine for colour and odour

Note 1: Monitoring period – June to September.

SCHEDULE D: Annual Environmental Report

Annual Environmental Report Content [Note 1]
Emissions from the installation.
Waste management record.
Resource consumption summary.
Complaints summary.
Schedule of Environmental Objectives and Targets.
Environmental management programme – report for previous year.
Environmental management programme – proposal for current year.
Pollutant Release and Transfer Register – report for previous year.
Pollutant Release and Transfer Register – proposal for current year.
Noise monitoring report summary.
Ambient monitoring summary.
Tank and pipeline assessment report.
Reported incidents summary.
Energy efficiency audit report summary.
Report on the assessment of the efficiency of use of raw materials in processes and the reduction in waste generated.
Report on progress made and proposals being developed to minimise water demand and the volume of trade effluent discharges.
A report on compliance with recommendations of the Detailed Quantitative Risk Assessment (DQRA) submitted to the Agency.
Development/Infrastructural works summary (completed in previous year or prepared for current year).
Reports on financial provision made under this licence, management and staffing structure of the installation, and a programme for public information.
Review of Closure, Restoration & Aftercare Management Plan.
Statement of measures in relation to prevention of environmental damage and remedial actions (Environmental Liabilities).
Environmental Liabilities Risk Assessment Review (every three years or more frequently as dictated by relevant on-site change including financial provisions.
Any other items specified by the Agency.

Note 1: Content may be revised subject to the approval of the Agency.

SCHEDULE E: Specified Engineering Works

Specified Engineering Works
Re-profiling and re-placement of waste.
Installation of final capping.
Construction of landfill infrastructure compound.
Installation of landfill gas management infrastructure.
Construction of storm water outfall to River Morell.
Construction of swales.
Construction of leachate pipeline to Johnstown Pumping Station.
Associated works including surface water management structures.
Development of elements of multi-use public park.
Any other works notified in writing by the Agency.

Sealed by the seal of the Agency on this the 7th day of March 2019.

PRESENT when the seal of the Agency
Was affixed hereto:

Tara Gillen

Tara Gillen, Authorised Person

Appendix C - Environmental Risk Assessment EMP

Effects # number	**Environmental Topic,** Aspects or Impact	Sensitivity of targets (0-5)	Magnitude of activities (0-5)	Level of significance in the context of this project (0-12)	Environmental Significance Ranking Value (SenXMagXImpt)	reference
1	Will the construction of this infrastructure be carried out in a systematic authorised, verified and validated way?	3	3	10	90	Yes
2	Will emissions affect local air quality?	3	3	12	108	Dust, odour
3	Will the project interference with any cultural assets?	2	2	7	28	not expected
4	Is the project likely to cause disruption to the diversity and character of the countryside?	1	1	5	5	not expected
5	Is there a risk of loss of viable populations of wildlife species throughout their range?	1	1	5	5	not expected
6	Will the project result in the deterioration in the status of rare and vulnerable species?	1	1	5	5	not expected
7	Will the project interference in the landscape form of the area?	3	3	10	90	Not expected outside intended purpose of the project
8	Will the project result in a permanent alteration in the background noise?	1	1	8	8	Possible in immediate locality
9	Will the project result in a temporary nuisance from construction noise?	2	2	12	48	BS5228
10	Will the project result in the risk of pollution of surface water?	4	2	10	80	Not expected
11	Will the project give rise to the risk of pollution of Groundwater?	4	2	10	80	not expected
12	Will ambient air quality be affected by the project (AQMA / AQAP)?	2	3	10	60	not expected
13	Will activities result in Combustion emissions of Sulphur dioxide, $SO_{2?}$	2	2	6	24	Plant Register Negligible impact, to be monitored by Irish Biotech Systems
14	Will activities result in combustion emissions Ammonia?	2	2	6	24	Diesel only Negligible impact, to be monitored by Irish Biotech Systems
15	Will activities result in combustion emissions Hydrocarbons (HC) & Volatile Organic Compounds, VOC?	2	2	6	24	Diesel only Negligible impact, to be monitored by Irish Biotech Systems
16	Will activities result in combustion emissions Carbon dioxide (CO_2)? Think carbon footprint?	2	2	6	24	Diesel and electric Negligible impact, to be monitored by Irish Biotech Systems
17	Will activities result in combustion emissions Nitrogen dioxide (NO_2)?	2	2	4	16	Diesel only Negligible impact, to be monitored by Irish Biotech Systems
18	Will activities result in combustion emissions Methane (CH_4)?	2	2	6	24	not expected Negligible impact, to be monitored by Irish Biotech Systems
19	Will activities result in combustion emissions Oxides of Nitrogen (NO_x)?	2	2	6	24	Diesel only Negligible impact, to be monitored by Irish Biotech Systems
20	Will activities result in combustion emissions Carbon Monoxide (CO)?	2	2	6	24	Diesel only Negligible impact, to be monitored by Irish Biotech Systems
21	Will activities result in combustion emissions Particulate matter (PM)?	2	2	4	16	Diesel only Negligible impact, to be monitored by Irish Biotech Systems

Effects # number	**Environmental Topic,** Aspects or Impact	Sensitivity of targets (0-5)	Magnitude of activities (0-5)	Level of significance in the context of this project Project (0-12)	Environmental Significance Ranking Value (SenXMagXImpt)	reference
22	Will Production activities give rise to Construction Dust for monitoring and control?	2	2	10	40	Dust Management Plan Possible impact
23	Will activities result in combustion emissions Benzene?	2	2	6	24	Diesel only Negligible impact
24	Will activities result in combustion emissions Lead (Pb)?	2	2	4	16	not expected Negligible impact
25	Will activities result in Ozone (O_3) emissions?	2	2	4	16	not expected
26	Will activities result in combustion emissions of Polycyclic aromatic Hydrocarbons (PAH's)?	2	2	6	24	Diesel only
27	Will activities result in combustion emissions of Trace metals?	2	2	4	16	Diesel only
28	Will activities result in Ground Investigations, Trail pits / boreholes?	2	2	10	40	Yes
29	Will activities result in Site Clearance, Removal to vegetation?	2	2	10	40	Site clearance
30	Will activities result in Fencing activities?	2	2	10	40	H&S Plan
31	Will the project impact on Traffic movements in the area and regionally?	3	3	10	90	TMP Yes beneficially
32	Will activities result in Topsoil removal during Road Construction?	2	2	3	12	Yes, reuse expected
33	Will the project require Excavations/Borrow pits etc.?	2	2	4	16	Not expected
34	Will the project result in Construction traffic Movements that will impact on local traffic or carbon emissions? Think average haul distance!	2	2	7	28	not expected
35	Are there environmental management Plans	2	2	10	40	H&S Plan
36	Will Piling activities be involved?	0	0	0	0	Trench support possible Negligible impact
37	Will the project involve consideration of Chemical decontamination for compound, workshops or material storage areas?	1	1	3	3	Chemical safety Not expected Negligible impact
38	Have drainage and recharge considerations been appraised as part of the hydrogeological reports for the project?	3	3	10	90	Yes discharge to river
39	Have Landscaping considerations been appraised of the project?	3	3	10	90	Yes
40	Have project requirements for Earth mounding been acknowledged?	3	3	10	90	Yes, expected
41	Has Spoil Disposal been appraised for the project as part of materials handling plan and materials use budget?	3	3	10	90	Yes, materials mass balance.
42	Will the execution of the project give rise to the risk of environmental Pollution?	2	2	8	32	Considered prepared EMP
43	Does the project involve the construction of Structures, Installation features (bridges, culverts, signage, fencing, etc.)?	2	2	10	40	Work schedule minimal structures

Effects # number	**Environmental Topic,** Aspects or Impact	Sensitivity of targets (0-5)	Magnitude of activities (0-5)	Level of significance in the context of this project Project (0-12)	Environmental Significance Ranking Value (SenXMagXImpt)	reference
44	Does the project involve the Installation of lighting scheme?	2	2	9	36	Ye, lighting considered
45	Does the project involve the on line construction of Road Alignments?	1	1	8	8	not expected
46	Has a Planting programme been considered for the project?	2	2	7	28	Yes
47	Will the project involve the Maintenance of Drainage Ditches during and after construction?	2	2	8	32	Yes
48	Are Lighting aspects important on this project? Think light pollution, carbon footprint, security?	2	2	5	20	not expected
49	Is Traffic management identified and resourced for this project?	3	3	10	90	Yes, TMP in place
50	Has consideration been given to Road Maintenance during the construction phase?	2	2	5	20	Yes, TMP in place
51	Have other Environmental Mitigation reports (not exhaustive), Ecological measures, pond creation, input form experts and National bodies been appraised?	2	2	9	36	Yes
52	Will the project involve Landscape Planting & other Screens as mitigations for impacts?	2	2	10	40	Environmental barriers expected
53	Has an EIS, EIA, SEA, Planning arrangements, AA, Ecological assessments, biodiversity assessments and such identified mitigation measures for inclusion?	3	3	10	90	See tender docs
54	Will the project result in the Direct loss of wildlife and wildlife habitats in any significant way?	2	1	5	10	not expected
55	Will the project result in the severance of habitats creating a barrier to divide exiting habitats and populations?	2	1	5	10	not expected
56	Will the project result in creatures killed by interaction with the infrastructure etc.?	2	1	5	10	not expected
57	Will the project result in the disruption to local hydrology for wetland sites altering conditions for existing inhabitants?	2	2	7	28	not expected
58	Will the construction activities result in the risk of Polluted run-off entering an adjacent habitat?	2	2	5	20	Not expected
59	Will the construction activities result in the risk of barriers for migrating species bird, mammal's large wader waterfowl?	2	1	5	10	not expected
60	Will the installation of new road lighting arrangements disturb the animals?	2	1	4	8	not expected
61	Will construction activities result in Air pollutants affecting the local habitat?	1	3	12	36	odour
62	Will spray from the road damage habitats in the local area?	2	2	4	16	not expected
63	Is it possible that disturbance during construction may have longer lasting effects?	2	2	8	32	not expected

Effects # number	**Environmental Topic,** Aspects or Impact	Sensitivity of targets (0-5)	Magnitude of activities (0-5)	Level of significance in the context of this project Project (0-12)	Environmental Significance Ranking Value (SenXMagXImpt)	reference
64	Will the construction activities change the Landform? Will existing natural features and contours disrupted?	2	2	10	40	not expected
65	Have seasonal differences, changes in vegetation patterns before during and after a project been considered?	2	1	5	10	not expected
66	Will the execution of the project result in the disruption of settlement patterns in an around the project?	2	3	10	60	Not in scope
67	Will the project have any detrimental effects on an existing noteworthy element?	2	3	10	60	Golf Club, Browne's Caravans
68	Will the project cause disruption or intrusion on an existing cultural and historic associations?	2	1	5	10	Not expected
69	Will the scale of the project identify an inconsistency between the project and important elements or characteristics of the landscape or traditions of the area?	2	2	3	12	not expected
70	Will the visibility of the project give rise to concerns during construction?	2	2	5	20	not expected
71	a) Will the level or elevation in the context of the landscape setting (consider mounds, bunds, cuttings, false cuttings) give rise to visually offensive experience?	2	3	10	60	not expected
72	b) Will the visibility of structures, roads, junctions, gantries, road signs give cause for concern?	2	2	5	20	not expected
73	c) Will the visibility of Lighting create environmental concerns?	2	2	4	16	not expected
74	d) Will new traffic arrangements and changes in the view of traffic flow for on lookers?	2	2	4	16	TMP
75	e) Will the Loss of trees and vegetation loss alter the visual experience?	2	2	5	20	not expected
76	f) Will the relationship of scale and materials during construction and after creating a visual an offensive view?	2	2	4	16	not expected
77	Will the project require the demolition of properties?	2	2	10	40	not expected
78	Will the project result in the Loss of common lands?	2	2	3	12	not expected
79	Will the project result in the Loss of Agricultural Land?	2	2	3	12	not expected
80	Will the project require the interaction with waterways?	2	3	8	48	River Morley
81	Will the project result in disruption caused by Construction noise?	3	3	12	108	BS5228 some
82	Will the project construction result in the disturbance of Wildlife?	2	2	5	20	Not expected
83	Will the project involve Blasting & vibration activities?	2	2	9	36	Noise & vibration
84	Wil the project involves the requirement for exceptional Heavy Construction Traffic, transport of cranes, large loads etc.?	2	2	10	40	Noise & vibration, traffic
85	Will the project involve noise from Rock breaking activities?	3	2	10	60	Noise & vibration
86	Will the project involve noise from Piling activities?	2	0	10	0	Noise & vibration

Effects # number	**Environmental Topic,** Aspects or Impact	Sensitivity of targets (0-5)	Magnitude of activities (0-5)	Level of significance in the context of this project Project (0-12)	Environmental Significance Ranking Value (SenXMagXImpt)	reference
87	Will there be Generators on site (night-time)?	3	0	10	0	Noise & vibration
88	Will there be Noise from Traffic Streams directed to sensitive targets at specific times during the project?	3	0	10	0	Noise & vibration
89	Will Road / tyre noise emerge as an issue from the project construction?	2	2	4	16	Not expected
90	Will the project result in vibration from traffic streams?	2	1	4	8	Noise & vibration
91	Will the project give rise to wildlife disruption from vibration?	2	1	5	10	Noise & vibration
92	Have Occupational Hearing damage considerations been assessed for the project?	2	4	10	80	H&S Plan
93	Have Vibration White finger risks been considered for the project?	2	4	10	80	H&S Plan
94	Will the project create risks of Whole arm vibration injury?	2	4	10	80	H&S Plan
95	Will the project create risks of Whole-body vibration injury?	2	4	10	80	Not expected
96	Will the project give rise to opportunities to create barriers to fish passage, blockages in watercourses - physical or hydraulic?	2	0	5	0	NA
97	Will the project create the risk of water pollution during construction and after?	2	0	5	0	Not expected
98	Will the activities give rise to sedimentation - impacts include smothering fish eggs and causing mortalities in fish of all ages, reducing abundance of food and impeding movement of fish. Cement, grout and concrete - toxic to fish. Oil and fuels - direct impacts on fish, fish food and fish habitats?	2	0	5	0	NA
99	Is the project planning the removal of bed material which may causes loss of instream vegetation and food? May destroy spawning or nursery habitats?	2	0	5	0	Not expected
100	Disturbance of riparian vegetation Loss of shelter and cover, loss of food (plant debris and vegetation invertebrates).	2	0	5	0	Not expected
101	Is there a risk of accidental spillages of fuels, lubricants and hydraulic fluids?	2	2	10	40	working with hydrocarbons
102	Does the project plan any water abstraction?	2	2	7	28	for site use
103	Will the project create a risk of pollution from vandalised stores?	2	0	4	0	site security
104	Will the project create a risk of pollution from waste materials or contaminated land?	4	3	10	120	Not expected
105	Will the project activities give rise to a risk of pollution or erosion from pumped discharges?	2	0	5	0	Not expected
106	Will the project create a risk of using unauthorised persons to collect, store, revolver, process or treat waste?	4	3	10	120	WMP Collection permit no. (valid)
107	Is it possible that the project may not meet the conditions of a waste permit or licence?	4	3	10	120	WMP Contractors audit and register of load movements

Effects # number	**Environmental Topic,** Aspects or Impact	Sensitivity of targets (0-5)	Magnitude of activities (0-5)	Level of significance in the context of this project Project (0-12)	Environmental Significance Ranking Value (SenXMagXImpt)	reference
108	Will the project reduce/eliminate waste by applying good materials' handling practices?	2	3	10	60	materials resource plan and waste minimisation goals, Zero waste
109	How will the project ensure that large surpluses of construction materials are not delivered to site? Think accurate estimating!	2	3	7	42	Materials plan, Zero waste to landfill goal
110	How will the Project coordinate suppliers where possible, suppliers should be encouraged to take back/buy back surplus and sub-standard/rejected materials?	2	2	8	32	IP004 Subcontrctors, enhanced protocol to capture resource usage.
111	Will a "just-in-time" delivery system be operated? Material deliveries should be co-ordinated with its use in order to reduce/eliminate waste?	2	2	8	32	Works Program
112	Where permitted, will the project use derived aggregates such as dry-filling, hard-core or as granular fill in construction works?	2	3	9	54	Works Program
113	Where permitted, on-site crushers will be used to produce aggregates thus reducing transportation impacts?	3	3	10	90	Works Program
114	Where permitted, inert material will be used in the restoration/reinstating of land prior to topsoil spreading or the restoration of borrow- pits off site. Example Environmental Control Measures – Storage and Treatment of Topsoil?	2	3	10	60	Landscape and Earthworks forming programme / RAMS
115	Will the compaction of topsoil be avoided, as this will limit growth?	2	2	10	40	not expected
116	Will the mixing of different top-soils in stockpiles be avoided to maximise use of materials?	2	2	10	40	As per landscape and earthworks program
117	Will the repeated handling of top-soils be avoided, as it can destroy the structure of the material?	2	2	10	40	not expected
118	Will stockpiles greater than two metres high be avoided to prevent anaerobic conditions?	4	3	10	120	As per landscape and earthworks program
119	Where possible, the use of rotating hammers or cutters during screening should be avoided to prevent noise and loss of materials?	4	3	11	132	not expected
120	Where possible transport over long distances should be avoided in order to retain local soil compatibility?	3	3	10	90	As per landscape and earthworks program
121	Where possible the movement of topsoil in wet weather should be avoided, to maximise the site use of materials?	3	3	10	90	As per landscape and earthworks program
122	Where possible topsoil should be loosely dumped in stockpiles that should be shaped to shed water?	2	2	8	32	As per landscape and earthworks program
123	How will the project ensure that invasive species should be removed from topsoil and safely disposed of?	2	2	10	40	Invasive spp protocols
124	Will the project use a traffic management plan to minimise the disruption to local area traffic flows in the area of the works?	2	3	12	72	TMP

Effects # number	**Environmental Topic,** Aspects or Impact	Sensitivity of targets (0-5)	Magnitude of activities (0-5)	Level of significance in the context of this project Project (0-12)	Environmental Significance Ranking Value (SenXMagXImpt)	reference
125	How will the project ensure that where possible stockpiling will be avoided?	2	2	10	40	As per landscape and earthworks program
126	Will the project allow that material can be compacted immediately after placement?	2	2	10	40	Works Program
127	Can the project ensure that the gradients be provided on compacted sub-soils to rapidly remove any surface water?	2	2	10	40	As per landscape and earthworks program
128	Will ruts caused by plant movements be removed?	2	2	7	28	not expected
129	Will a specialist hazardous waste contractor should be engaged prior to the commencement of works that may generate such waste?	4	2	10	80	Not expected
130	Will hazardous waste be segregated into a separate well-marked containers and kept at least 50 metres from watercourses or boreholes and wells?	4	2	10	80	WMP
131	Will all site personnel be made aware of the requirement to segregate hazardous from non-hazardous waste?	4	2	10	80	WMP
133	Will all Vehicle batteries be collected as hazardous waste?	4	2	10	80	WMP
134	Will all containers with residues of resins, latex, and plasticizers, glues, and adhesives, wood preservatives be kept separate and collected for has waste disposal?	4	2	10	80	WMP
135	Will all Mineral oils or oily substances be kept separate for collection as waste oils?	4	2	10	80	WMP
136	Will all timber, including fencing, treated with Copper-Chrome-Arsenic timber preservative be treated as hazardous waste?	4	2	10	80	not expected
137	Will all Gas cylinders be returned and replaced as appropriate?	4	2	10	80	WMP
138	Will all Asbestos materials be especially identified and treated?	4	2	10	80	Not expected
139	Will all Hazardous waste be removed from site by a specialist waste contractor with waste collection permit?	4	2	10	80	WMP
140	Will all hazardous waste facilities be licenced by the Environmental Protection Agency (EPA)/ County council and that the hazardous waste contractor provides a copy of the licence for the facility on site?	4	2	10	80	WMP
141	Ensure appropriate consignment notes (C1 Forms) track and monitor the movement of hazardous waste within the State. C1 Forms should be completed for every consignment of hazardous waste other than the movement of waste within the premises where it is produced, stored, treated or deposited and are available from the local authority?	4	2	10	80	WMP

Effects # number	**Environmental Topic,** Aspects or Impact	**Sensitivity of targets (0-5)**	**Magnitude of activities (0-5)**	**Level of significance in the context of this project Project (0-12)**	**Environmental Significance Ranking Value (SenXMagXImpt)**	**reference**
142	Ensure the export of hazardous waste occurs only on completion of a TFS Form. A Local Authority issues and monitors Trans frontier Movement of Waste Forms which are used to control and track movements and disposal/recovery of certain categories of waste outside the State. The specialist waste disposal company, employed by the contractor, should arrange for the correct completion of these forms. The Environmental Manager should ensure that copies of these forms are completed in conjunction with the waste contractor and are kept for the duration of the project?	4	2	10	80	WMP
	Total Scores	2.34	2.01	7.79	6036	

Appendix D - Environmental Policy

Wills Bros IMS Policy

Wills Bros is committed to managing Occupational Health & Safety, Environmental and Quality (OHSEQ) as a core foundation of its business activities. Our policy is to set high standards in all aspects of (OHSEQ) management across our Civil Engineering operations through our IMS, allowing us to meet and exceed our Client's expectations. This includes management of employees, subcontractors, as well as our interactions with customers, and other interested parties.
Wills Bros main objective is to become the Civil Engineering contractor of choice for existing and future Clients. We aim to deliver consistent exemplary planning, design, procurement, construction, installation and commissioning products and services in accordance with leading edge best practices and Client specific requirements; while ensuring all stakeholders go home safe at the end of each working day.

To achieve these goals Wills Bros are committed to the following principles:

Compliance

- We commit to fulfil legal and other requirements and ensure where practicable compliance to standards / specifications by implementation of ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 management systems and processes.

Client Focus

- Success for Wills Bros is safe delivery of world class affordable products and services, we are committed to understanding our Clients' needs by providing effective, efficient and innovative construction services. We will deal with nonconformity appropriately.

Leadership

- Ensuring Wills Bros Top Management establish unity of purpose and direction, aligned with the company vision, Identifying, understanding and leading delivery of interrelated processes as a system contributes to Wills Bros effectiveness and efficiency in achieving our goals and objectives.

Safety and Well Being of the Workforce

- Everyone has a right to health and happiness. We will provide safe and healthy working conditions, preventing work related injury and ill health. No one should be harmed physically, mentally or emotionally as a result of our work.

Achieving Excellence

- It is the aim of Wills Bros to be the Civil Engineering Contractor of choice in Ireland and the UK;
- We aim to lead in excellence, to be the benchmark for OHSEQ Management that other companies will aspire to.

Risk Based Emphasis

- We will explicitly strive to identify and address risks affecting product service and compliance;
- We aim to eliminate hazards and reduce Environmental / OH&S risks and implement opportunities for improvement where identified.

Investing in and Involving our People

- We are aware that people at all levels are the essence of the organisation and their full involvement enables the utilisation of their abilities for mutual benefit of Wills Bros and employee;
- We realise that every team member is jointly responsible for the OHSEQ performance of the services we provide. We will promote a culture of 'Right First Time' amongst our team members and supply chain;
- We commit to the consultation, participation of workers and liaison with the workers representatives, where they exist.

Process Approach

- When activities and related resources are managed as a process the desired result is achieved effectively and efficiently, leading to lower costs and shorter project cycle times through effective use of resources;
- Improved, consistent and predictable results aiding Lean construction improvement opportunities.

Factual Approach to Decision Making

- We will make effective decisions based on the analysis of data and information.

Mutually Beneficial Supplier Relationships

- Wills Bros and its suppliers are interdependent, and a mutually beneficial relationship enhances the ability of both to create value engineering solutions to Customers;
- We will communicate and consider a "Life Cycle Thinking" strategy in all our procurement dealings:

Corporate Social Responsibility and the Environment

- Wills Bros recognises that protection of the environment requires that construction activity is conducted in a sustainable manner. We aim to minimise energy use through effective energy management;
- Wills Bros social responsibility falls under two categories: compliance and proactiveness. Compliance refers to our company's commitment to legality and willingness to observe community values. Proactiveness is every initiative to promote human rights, help & engage communities, and commitment to the protection of the environment, including prevention of pollution and other specific commitments;

Continual Improvement

- We strive for excellence in the Quality of all our deliverables to the Client. We monitor our IMS by establishing, measuring and communicating our Key Performance Indicators (KPI's) against a framework of objective targets, with a view to Continual Improvement and enhanced OHSEQ performance.

Communication and review

- This Policy will be communicated to all employees at induction, it is available on SharePoint as documented information to ensure it is understood and applied within the organisation. It is displayed in all our offices where other interested parties can view if required;
- The Policy will be reviewed annually to ensure it still meets all company requirements:

Charles Wills Managing Director **Date: 25th June 2020**

Appendix E – Specialist Monitoring Records, Complaints and Environmental Incident Reports

EMP	2587-Kerdiffstown Landfill Remediation Project		
Site Specific EMP	Note: Always print or copy to double-sided pages	**REV:**01	**Date:** 07-10-2020

NOTE: **Circle all Applicable Sections as appropriate.**

Environmental Incident Record Form

Site Name			**Date Occurred** _____/_____/_____	
Site Type*	Development (inc SI)	Construction	Operational	Decommissioning
Category of Incident*	Major	Minor	Near Miss	
Location of Incident including chainage reference or coordinates (if available).				

Type of Incident*	**Emissions to Land**	**Emissions to Water**	**Emissions to Air**	**Littering or Fly Tipping**	**Nuisance Complaint**	**Other (specify)**
Est. volume / quantity						

Notifications*	**Landowner**	**SEPA/EA/ NIEA/EPA**	**Local Authority**	**Water Utility**	**Supplier**	**Emergency Services**	**WB Director/ Mgr / Site Supervisor**
Date							
Person notified							

Description of the incident; what happened? where did it happen? when did it happen? (date and time)

Witness(es):

Response / Corrective Actions

Why did it happen? (cause of the incident)

Measures to remedy and prevent a recurrence	**Owner**	**Priority (H/M/L)**	**Due By**	**Sign Off**

Responsibilities	**Name**	**Position**	**Date**
Incident reported by			
Incident Investigated by			
Incident close out sign Off			

Appendix F - Environmental Reports

Ecological Weekly reports

a) **Weekly environmental Reports**
b) **Water Quality reports etc.**

Appendix G – Materials Testing

Appendix H – Archaeological Reporting

Appendix I – Environmental/Sustainability Inspection Report

Environmental / Sustainability Inspection Report

WB.IMS.IP041.FM006

NOTE :- The following form can be used in its entirety or targeted towards specific sections only based on the environmental priorities on site, the experience and time available to the person carrying out the inspection, and the stage of the works. However, it is recommended that completion of the full form is attempted at least once per project.

Project Title	Project No.	Inspection By	Date / Time	Project Manager	Client

Section 1 – Overall Assessment

Inspection Item - Questions	Relevance			Comments/Recommendations	Target Close-Out Date	Close Out Confirmation	
	Y	N	N/A			ACTION OWNER (Initials)	DATE OF CLOSE - OUT
Has a Construction Environmental Management Plan (CEMP) been prepared for the project? Is it adequate and up-to-date?							
Visual Inspection – what are your overall first impressions of the site compound upon arrival? Does it appear generally clean and tidy?							
Does the main site appear well organised and being maintained in good condition? Housekeeping etc.							
Is the site entrance and boundary features defined and serving their purpose?							
Are notice boards and environmental/ecology signage present, visible & legible?							
Are the requirements of the company's ISO14001 Management system being implemented? i.e. Incident investigations/inspections/consultations etc?							
Is the permit to work system working effectively to meet environmental commitments ? Is the ecological permit to work, permit to pump and other relevant permits being used as required?							
Any significant environmental incidents since the last inspection. Have they been managed and closed out?							
Have environmental requirements been incorporated into the site induction? Have all major considerations been incorporated for communication to the workforce?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

Environmental / Sustainability Inspection Report

WB.IMS.IP041.FM006

Wills Bros

Section 2 – Air Quality							
Inspection Item - Questions	**Relevance**			**Comments/Recommendations**	**Target Close-Out Date**	**Close Out Confirmation**	
	Y	**N**	**N/A**			**ACTION OWNER (Initials)**	**DATE OF CLOSE - OUT**
Visual Inspection – Is any visible dust being produced on site, and is it causing a nuisance to neighbours?							
Is dust suppression mitigation in place?							
Are Plant & Vehicles adhering to site speed limits?							
Are dust suppression measures being applied to cutting and grinding operations?							
Are public roads, footpaths and interfaces free of mud and dirt?							
Are facilities for vehicle washing / wheel washing required or in place?							
Is any burning of material occurring on site? (normally a prohibited activity)							
Are vehicles and plant on-site allowed to run idle when not in use?							
Is there any odour-causing waste building up on site?							
Is hoarding present for dust or visual screening purposes where required?							
Is crushing/screening equipment fitted with water suppression accessories where needed?							
Is there a programme of air quality monitoring in place if required?							
Any requirements for specific toolbox talks or training on the topic of air quality?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

SECTION 3 – WATER MANAGEMENT AND POLLUTION CONTROL							
Inspection Item - Questions	**Relevance**			**Comments/Recommendations**	**Target Close-Out Date**	**Close Out Confirmation**	
	Y	**N**	**N/A**			**ACTION OWNER (Initials)**	**DATE OF CLOSE - OUT**
Have all adjacent watercourses/waterbodies at risk of harm been identified?							
Are measures being implemented on-site to protect the water environment? Are they working effectively?							
Has a suitable Pollution Prevention Plan been submitted / approved to the regulatory authority (if required)?							
Are all areas of contaminated land identified and protected from harming ground and surface water?							
Are any of the following discharges entering watercourses and / or sensitive areas: ▪ Wastewater from washout of concrete; ▪ Wastewater from washout and cleanout of paint, form release oils / agents, concrete grinding slurry, curing compounds and other construction materials; ▪ Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; ▪ Soaps, solvents, or detergents used in vehicle and equipment washing; and ▪ Toxic or hazardous substances from a spill or other release.							
Are mitigation measures in place and operating effectively to control runoff / prevent sediment release into any watercourse?							
Any evidence of runoff from earthworks entering roadways / drains?							

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Are impermeable lagoons set up for concrete wash out? Are these clearly signposted? Is there a clearly demarcated access point?							
Any evidence of non-permitted in-stream works being conducted outside of those agreed with the relevant environmental agency / authority?							
Is hardstanding run-off and site track/haul road run-off being directed to a settlement feature to allow settlement or filtration of suspended solids?							
Are swales, lagoons, settlement ponds, silt traps and all water quality mitigation measures in good condition and maintained.							
Do drainage crossings adhere to requirements?							
Are pipe inlets/outlets clear?							
At watercourse crossings, is disturbance and silt generation being minimised, are all mitigation measures in place and are they working adequately?							
Are appropriate licences in place for temporary and permanent discharges?							
If dewatering of excavations is occurring are there adequate measures in place to protect nearby watercourses or drains (e.g. regular monitoring, pumping over grass, use of silt sediment tanks)?							
Visual inspection - any evidence of runoff or build-up of silt disposition in watercourses?							
Is stockpiled material being stored a safe distance from the nearest watercourse and being stored at the permitted height?							
Is silt fencing in place where required?							
Is a programme of water sampling being carried out?							
Is water being conserved/used responsibly where possible on-site?							
Any requirements for specific toolbox talks or training on the topic of water management?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

SECTION 4 – CHEMICALS AND REFUELLING OPERATIONS							
Inspection Item - Questions	**Relevance**			**Comments/Recommendations**	**Target Close-Out Date**	**Close Out Confirmation**	
	Y	**N**	**N/A**			**ACTION OWNER (Initials)**	**DATE OF CLOSE - OUT**
Are all Hazardous Substances stored securely with consideration to the risk of fire, vandalism, accidental leaks etc?							
Are fuels and chemicals being stored in appropriate containers which are fit for their purpose?							
Are adequate control measures to prevent concrete, cement and grout pollution being implemented?							
Are adequate control measures for oil storage being implemented?							
Are portable fuel containers (jerry cans) kept in a bund or drip tray and attended when in use, or locked away when not in use?							
Are fuel containers (jerry cans) labelled correctly so that the contents are readily identifiable?							
Are adequate control measures for re-fuelling being implemented? Is there a designated refuelling location on site which is located a safe distance from sensitive receptors?							
Are large quantities of fuel being stored on site or is it delivered in limited quantities as required? Are fuel bowsers stored in a suitable location away from watercourses/drains/sensitive receptors when not in use?							
Do all fuel tanks/fuel bowsers have signage and markings displaying their quantities and associated hazards in accordance with legal requirements?							

Are sufficient spill kits available at suitable locations (check if any have been used or if they are in need of replacement) and are their containers free from rubbish and used absorbent materials?							
Is plant and equipment maintenance being carried out any an environmentally acceptable manner?							
Are containers of harmful substances leakproof and stored within impermeable bund with capacity of 110% of max volume as per industry practice?							
Are drip trays/ absorbents being used under leaky vehicles until such time as they are repaired?							
Has an environmental spill response plan been developed, communicated and tested? Has a spill response team been designated, resourced and trained?							
Any requirements for specific toolbox talks or training on the topic of chemicals or refuelling?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

SECTION 5 – SITE WASTE MANAGEMENT							
Inspection Item - Questions	**Relevance**			**Comments/Recommendations**	**Target Close-Out Date**	**Close Out Confirmation**	
	Y	**N**	**N/A**			**ACTION OWNER (Initials)**	**DATE OF CLOSE - OUT**
Has a site waste management plan been developed for the project?							
Is waste being separated and disposed of correctly?							
Is waste being disposed of in the correct skip/container (check no hazardous waste is being disposed of in the general waste skip) and are any skips due for emptying?							
Can unused materials be returned to purchaser or used on another job?							

Have opportunities been considered for on-site processing and re-use of materials? Are any permits or exemptions required?							
Is the site kept in a tidy, well managed condition, free from litter?							
Are all waste skips/containers: ▪ Suitably labelled? ▪ Lids/covers securely on? ▪ Easily accessible to staff? ▪ In good condition? (i.e. no rust or holes)							
Are Duty of Care procedures complied with, including provision of transfer notes and checking authorisation of registered carriers, registered exempt sites and licenced waste management facilities?							
Are Waste Transfer Notes kept in the site file and do they contain the correct information ?: ▪ Contact details and addresses of waste producer, carrier and destination ▪ Environmental agency registration and/or permit numbers of waste producer, carrier and destination ▪ Description of waste and the EWC/SIC code ▪ Quantity of waste produced and container type							
Are reports being produced regarding waste quantities and treatment/disposal routes, and on costs incurred?							
Has a final report of use of recycled and secondary materials, waste reduction, segregation, recovery and disposal, with costs and savings identified, been completed?							
Any requirements for specific toolbox talks or training on the topic of site waste management?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

SECTION 6 – NOISE & VIBRATION							
Inspection Item - Questions	Relevance			Comments/Recommendations	Target Close-Out Date	Close Out Confirmation	
	Y	N	N/A			ACTION OWNER (Initials)	DATE OF CLOSE - OUT
Are agreed working hours being adhered to? Are there any amendments to agreed working hours for a specific task? If so, has permission been obtained from the local authority?							
Is rock breaking being carried on site?							
Is piling being carried out on site?							
Is blasting being carried out on site?							
Is demolition being carried out on site?							
Is vibratory or dynamic compaction occurring onsite?							
Is cable percussive testing occurring onsite?							
Are any other works being carried out on site which could create loud noise or vibration?							
Are works being undertaken out in a manner to cause minimal disturbance to nearby sensitive receptors?							
Is a programme of noise & vibration monitoring in place ?							
Are vehicles / machinery switched off when not in use?							
Any requirements for specific toolbox talks or training on the topics of nuisance/noise/vibration etc?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

SECTION 7 – FLORA & FAUNA				
Inspection Item - Questions	Relevance	Comments/Recommendations		Close Out Confirmation

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	Y	N	N/A		Target Close-Out Date	ACTION OWNER (Initials)	DATE OF CLOSE - OUT
Have update / pre-construction surveys been completed prior to works commencing?							
Have any protected and/or notable plant or animal species been recorded within or adjacent to the site / the current works area? Have suitable mitigation been installed?							
Have all consents, licences, permissions, method statements, protection plans been obtained and approved prior to works commencing?							
Have Ecological Permits to Work been issued by the ECoW for works being undertaken on site?							
Have exclusion zones been established? If so, are they clearly fenced off/ signed/labelled. Any maintenance needed to exclusion zone?							
Have any invasive, non-native species been identified? Is their control being suitably managed?							
Are works taking place close to trees? Have tree root protection zones been established? Are there any overhanging branches which could be damaged?							
Is ground vegetation being cleared e.g. grass, scrub, trees? Have the appropriate checks been undertaken e.g. breeding birds, amphibians, bats, red squirrel?							
Are trenches/ excavations/ pipes being covered at the end of the working day to prevent animals falling in? If not, has a suitable means of escape e.g. ramp, been provided?							
Are plant and personnel constrained to a prescribed working corridor? Is this being maintained?							
Are any works being undertaken on site which could disturb any ecological receptors?							
Any requirements for specific toolbox talks or training on the topic of ecological conservation?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

SECTION 8 – CULTURAL HERITAGE							
Inspection Item - Questions	**Relevance**			**Comments/Recommendations**	**Target Close-Out Date**	**Close Out Confirmation**	
	Y	**N**	**N/A**			**ACTION OWNER (Initials)**	**DATE OF CLOSE - OUT**
Have pre-construction checks or surveys required? Have these been completed prior to works commencing?							
Have any features of cultural heritage interest been recorded within or adjacent to the site / the current works area? Have suitable mitigation been installed?							
Have all consents, licences, permissions, method statements, protection plans been obtained and approved prior to works commencing. Written Scheme of Investigation?							
Have Permits to Work been issued by the archaeologist for works being undertaken on site?							
Is an archaeological watching brief required?							
Any recording of assets required? Photographic?							
Have exclusion zones been established? If so, are they clearly fenced off/ signed/ labelled. Any maintenance needed to exclusion zone?							
Has the CEMP and ES and associated Appendices been checked in advance of works for cultural heritage requirements and baseline conditions?							
Have any unexpected finds been discovered?							
Any requirements for specific toolbox talks or training on the topic of cultural heritage?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

SECTION 9 – LANDSCAPE & PLANTING							
Inspection Item - Questions	**Relevance**			**Comments/Recommendations**	**Target Close-Out Date**	**Close Out Confirmation**	
	Y	**N**	**N/A**			**ACTION OWNER (Initials)**	**DATE OF CLOSE - OUT**
Have landscape plans been checked prior to the works commencing?							
Have tree surveys been undertaken? Is there a tree root protection plan?							
Are all plant species listed of native origin? Are they suitable for planting in that location?							
Are any permits/ permissions required?							
Is supervision by an arboriculturalist required (Contractor and/or Employer)?							
Is there a method statement for works adjacent to trees/ for tree removal? Has this been submitted and approved by the Planning Authority?							
Are there any invasive, non-native plant species within the works area? Are there any species present which might require special disposal e.g. ash?							
Have exclusion zones been established? If so, are they clearly fenced off/ signed/ labelled. Any maintenance needed to exclusion zone?							
Are all plants being stored correctly on site?							
Is the works area carefully marked out to prevent any damage to nearby trees / roots / overhanging branches?							

Any limitation to the height of stockpiles? Is this being adhered to?							
Are stockpiles/materials being stored close to tree roots?							
Are Provenance records being checked and stored in the CEMP/ submitted to the Employer for approval?							
Are Pesticide records being completed, stored in the CEMP and/or submitted to the Employer?							
Any requirements for specific toolbox talks or training on the topic of landscaping and planting?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

SECTION 10 – SUSTAINABILITY							
Inspection Item - Questions	**Relevance**			**Comments/Recommendations**	**Target Close-Out Date**	**Close Out Confirmation**	
	Y	**N**	**N/A**			**ACTION OWNER (Initials)**	**DATE OF CLOSE - OUT**
Is the project registered with the Considerate Constructors Scheme, CEEQUAL, BREEAM or any other such scheme?							
Has the project designated a Public Liaison Officer? Does the project have a community liaison strategy?							
Does the project have a community benefits plan or employment and skills strategy?							
Has the project engaged with local schools, community groups or educational institutions to promote the construction industry and the Sustainabilty agenda?							
Have the workforce received any training on green initiatives such as spill prevention, ecological awareness, carbon reduction etc?							
Has the site implemented any energy or resource conservation initiatives ?							
Do the offices or welfare facilities have any features which conserve electricity, water or heat?							
Has the site given consideration to sustainable transport options, carpooling, cycling, walking to work etc?							

Has the site run any healthy eating or healthy living campaigns which promote better health amongst the workforce?							
Has the project championed any fundraising initiatives which benefit local charities or the local community?							
Does the project have any examples of promoting green/sustainable procurement initiatives?							
Does the project promote the virtues of fairness, inclusion and respect? (i.e. Equality & Diversity)							
Has the scheme design made provision for any features that will enhance local ecology and the local environment?							
Will the completed project improve the lives of local pEMPle upon completion? How?							
Any requirements for specific toolbox talks or training on the topic of sustainability or energy conservation?							
ACCOMPANYING EVIDENCE / PHOTOGRAPHS							

SECTION 11 – CLOSING COMMENTS

Noise Monitoring Record

WB.IMS.IP041.FM014

PROJECT DETAILS						
PROJECT TITLE					**PROJECT NO.**	
MONITORING DETAILS	**DATE**		**TIME**		**DURATION**	
MONITORING BY						
SOURCE(S) DESCRIPTION						
MONITORING EQUIPMENT						
MAKE						
MODEL						
SERIAL NO.						
CALIBRATION DATE						
MONITORING LOCATION						
SKETCH / PHOTOGRAPH						

WIND CONDITIONS					
☐ **MEASURED**	**EQUIPMENT DETAILS:**				
☐ **ESTIMATED**	**Select**	**Force**	**m/s**	**Description**	**Conditions**
	☐	0	<0.3	Calm	Calm, Smoke rises vertically
	☐	1	0.3 – 1.5	Light air	Wind motion visible in smoke
	☐	2	1.5 – 3.3	Light Breeze	Wind felt on exposed skin
	☐	3	3.3 – 5.5	Gentle Breeze	Leaves and smaller twigs move
	☐	4	5.5 – 8.0	Moderate Breeze	Dust and Loose Paper rise.
	☐	5	8.0 – 10.8	Fresh Breeze	Small trees sway

WEATHER						
WIND DIRECTION		**CONDITIONS**	☐ Fog	☐ Drizzle	☐ Snow	☐ Sun
TEMPERATURE			☐ Rain	☐ Frost	☐ Cloud	☐ Dry

MEASURED NOISE LEVELS					
Leq	**L10**	**L50**	**L90**	**Lmin**	**Lmax**

GENERAL COMMENTS

Dust Monitoring Record

WB.IMS.IP041.FM016

PROJECT TITLE		**PROJECT NUMBER**	
SAMPLE TESTING LABORATORY			
REASON FOR MONITORING		**MONITORING PARAMETERS**	
MONITORING BY:		**EQUIPMENT USED**	

LOCATION	PHOTO	SAMPLE REFERENCE	START DATE	END DATE	DURATION (DAYS)

PHOTOS / SKETCHES (IF USEFUL FOR REFERENCE).

Appendix J – Environmental Commitments and Mitigation Measures.

(Reference Chapter 19 of EIAR)

Mitigation Measure	Mitigation No. (EIAR Ref.)	Environmental Factor	Environmental & Mitigation Measures
General Requirements	GR1	General Requirement – CEMP	Prior to commencement of the Remediation Phase, the appointed contractor responsible for the remediation works shall **prepare a Construction Environmental Management Plan (CEMP)** for agreement with Kildare County Council (KCC). The CEMP shall contain the mitigation measures and plans identified in the following Sections (as a minimum), the wider EIAR and shall implement the conditions set out in the planning approval and the requirements of the site's Industrial Emissions Activities Licence (IEAL). The CEMP shall set out all the intended methods to manage potential environmental impacts from remediation of the proposed Project, and shall include the following as a minimum: • Groundwater Management Plan • Odour Management Plan (to be developed using the existing draft Odour Control Plan, SKM 2013) • Dust Management Plan • Noise and Vibration Management Plan • Invasive Species Management Plan • Site Biodiversity Management Plan • Erosion and Sediment Control Plan • Contaminant Spill Emergency Plan • Construction Traffic Management Plan • Mobility Management Plan • Waste and Materials Management Plan
	GR2	General Requirement – CEMP	The CEMP shall also incorporate the requirements of the **existing plans** developed for the proposed Project, including but not limited to: • Landfill Gas Management Plan (including risk assessment) • Leachate Management Plan • Surface Water Management Plan • Landscape Masterplan Statement • KLRP Management Plan Accident and Emergency Response • Monitoring and Control Management Plan These Plans and the CEMP are live documents and will be reviewed on a regular basis and updated accordingly by the appointed contractor, in particular the document shall be reviewed on receipt of planning approval and grant of the IEAL.
	GR3	General Requirement – CEMP	The **key elements** of the CEMP shall include: • Appointment of an Environmental Officer by the appointed contractor for the duration of the Remediation Phase • Incorporation of environmental commitments and requirements

`General Requirement Mitigation			• Incorporation of procedures to record any environmental incidents on site and procedures for implementing appropriate corrective and preventative measures • Outlining the methods by which the remediation works will be managed to meet these commitments and requirements • Outlining the relevant guidance (with those outlined in the EIAR as a minimum) that have informed the Plan development • Incorporation of procedures for communicating with KCC, the public and stakeholders • Incorporation of procedures for staff environmental awareness training • Incorporation of environmental monitoring procedures • Incorporation of a system of audit and review with regard to the effectiveness of the Plan
	GR4	General Requirement – CEMP	The appointed contractor shall ensure that the **CEMP is fully implemented** during the Remediation Phase in agreement with KCC, to prevent or reduce the impacts identified in the impact assessment.
Works and Methods Mitigation Measures	WM1	Proposed Works – Concrete Structures	On-site concrete structures are envisaged to be demolished by pneumatic breakers fitted to excavators. Where noise limits are likely to be exceeded noise barriers will be provided between the works and identified receptors in proximity to the working area in accordance with the mitigation measures specified in EIAR Chapter 8 Noise and Vibration. The broken out material will be processed using mobile crushing and screening plant to be located in Zone 2B, due to its reduced exposure to surrounding environs compared to Zone 2A. Dust suppression techniques will be employed, by spraying water from a site bowser or similar, in accordance with the Dust Management Plan developed as part of the Construction Environmental Management Plan (CEMP).
	WM2	Proposed Works – Waste	In order to prevent damage to the capping system only selected waste, to exclude large and bulky or sharp items such as concrete blocks and rebar, will be used to form the final lift of waste across Zones 1 and 3 immediately below the regulation layer. Selection and placement of the final layer of waste will be carried out under the supervision of a suitably trained and qualified person. Each waste layer placed will be covered at least by the end of the working day with the application of daily cover to assist with control of odours as well. This may comprise soils or geosynthetics, widely used for such purposes in the waste management industry as a temporary cover. The objective of the daily cover is to ensure windblown litter and debris are minimised, vermin is prevented from entering the waste mass and scavenging is prevented as far as practicable and the depth of cover is sufficient to avoid future problems of perched leachate. A stockpile of cover materials will be maintained, as necessary, in the vicinity of the operational area in order to ensure that exposed waste can be covered at the end of each working day. The use of alternative cover methods (e.g. proprietary geosynthetic sheeting) will be agreed with the EPA prior to use.
	WM3	Proposed Works – Leachate	During the Remediation Phase the generation of leachate will be managed through a number of on- site management operations, including: • Working in discrete areas to minimise the area of exposed waste; • Interception of any leachate outbreaks identified during waste excavation and re-profiling activities;

Works and Methods Mitigation Measures			• Provision of daily cover to exposed wastes, occurring as part of the remediation works; and • Progressively remediate the site with a landfill cap.
	WM4	Flaring	During remediation works the flare will be moved around the site to support key extraction areas, to reduce emissions and odour if observed during the works.
	WM5	Proposed Works – Contractor	A suitably competent contractor(s) will be appointed to undertake remedial works at the site, with surface water management a particular aspect to be closely monitored and controlled. The contractor will be required to construct temporary perimeter bunds and silt fences to enable separation of working areas from remediated areas. However, it is anticipated that until initial vegetation coverage, comprising grass, fully germinates silty runoff from capping soils may still be prevalent and require control. The appointed contractor(s) responsible for the remediation works will be required for ensuring a break between working (exposed waste) areas and remediated areas (restored) is maintained to prevent cross contamination. The appointed contractor(s) may also utilise temporary on site lagoons to retain surface water runoff, with silt buster tanks (or similar) used to limit the amount of silt being disposed to the ponds/ lagoons. Water collected in these lagoons will be used for dust suppression across the open working areas and, if not contaminated, over restored areas with any contaminated waters removed from the site by road tanker. The appointed contractor will be required to prepare a Construction Environmental Management Plan (CEMP) for agreement with KCC, for the contractor to then implement through the Remediation Phase, with water contamination testing requirements and limits to be agreed by the EPA.
	WM6	Proposed Works – Oil Interceptors	Oil interceptors will be required during the Remediation Phase to serve temporary working areas (e.g. potential laydown area, fuelling station, temporary car park and wheel wash area). These interceptors will be removed on completion of the remediation works.
	WM7	Proposed Works – Surface Water	Surface water management ponds in Zone 1A and Zone 4 are to be developed as part of the remediation works, only discharging once remediation works have been completed. An impermeable cap will isolate the waste body from interacting with rainfall on the site and nearly all rainfall will result in runoff which will have to be managed to avoid flooding or ponding of water on the site. This rainwater/surface water will not have interacted with waste or leachate in any way and will be equivalent in quality to runoff from parkland or agricultural fields with a degree of suspended solids which will need to be reduced before discharge, with the pond in Zone 1A discharging to groundwater via a soakaway and the ponds in Zone 4 discharging to surface water.
	WM8	Proposed Works – Contamination	To prevent possible contamination of clean materials by site wastes separate stockpiling areas for imported materials and site won materials will be established. Stockpiling arrangements are summarised in the following table with stockpile locations shown indicatively on EIAR Figures 4.8 and 4.9. Stockpile locations are retained on existing concrete hardstanding areas as far as practicable, to offer

Works and Methods Mitigation Measures			a separation to and protection of the underlying materials. Other areas will require to be designated on site, such as holding areas, quarantine areas and storage of unprocessed waste. Storage of processed waste is unlikely to be necessary as it would be transported to the infill area (typically Zones 1 and 3) immediately to reduce the need for double handling. The general segregation imported clean materials and site material stockpiles between Zones 2A and 2B respectively will also limit the risk of cross contamination of clean materials by avoiding the need for road going vehicles to directly traffic on or though areas containing exposed waste materials. Surface water management proposals indicate that there will be no discharge from the site permitted during the remediation works. The ponds will be adopted as retention ponds during the remediation works, and the appointed contractor shall be required to utilise silt-buster traps as is typical on earthworks/ construction projects. To further mitigate the risk of off-site contamination, all road going vehicles which access stockpile areas will be required to pass through a wheel washing facility prior to exiting the site. Further, site access roads including Kerdiffstown Road will be subject to regular road sweeping. Sizing of stockpiles cannot be determined at this stage as it is dependent on the availability of suitable material for import, the programming of the works, subject to planning approval being granted, and the procurement approach adopted. Stockpiling of materials will be undertaken in accordance with 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites' published by the UK Department for Environment Food and Rural Affairs or equivalent Irish guidelines. As a minimum stockpile management will include: • Visual screening for potential contaminated materials; • Segregation of material suspected to be contaminated from clean materials; • Stockpiling of materials at appropriate heights / batters to prevent potential instability; • Protection of stockpiled materials from scour / erosion; • The provision of adequate drainage to limit and control potential contaminated surface water runoff, including silt mitigation; • The avoidance of un-necessary trafficking / handling of stockpiled materials; • The following additional measures shall be applied to topsoil stockpiles: • A limitation on stockpile height to prevent degradation of the topsoil structure; and • Adequate control of weed growth. With the exception of top soil (or soil forming materials), stockpile heights will be restricted to a maximum of 4m to facilitate adequate management during the works. A reduced stockpile height of 2m will apply to any top soil / soil forming materials to prevent possible degradation of soil structure. The Contractor shall keep a watching brief on stockpiled soil to prevent mammal activity, including badgers.

Works and Methods Mitigation Measures	WM9	Proposed Works – Waste Acceptance	The proposed Project will not operate as a landfill and will not accept waste for disposal but will require importation of inert wastes for use as engineering materials, such as aggregate, subsoil and top soil. In such instances, waste acceptance procedures shall be followed. The procedures will be supported by a summary note of Waste Acceptance Procedures (for issue to Contractors when seeking appropriate materials) and an extract from Part VIII of the Waste Management (Licensing) Regulations 2004, to confirm the wastes that are prohibited from the proposed Project. For all soils proposed for the remediation of the site a source specific determination of their suitability shall be required. Source materials which have the potential to be contaminated shall be tested to determine the suitability of the soils for use in the remediation works. The testing protocols and the frequency of testing shall be determined from an assessment of the source site. This methodology shall be carried out for both greenfield and brownfield sites. Once the source information is available then a site specific risk assessment shall be undertaken to identify the actual risks posed by the contaminants in their proposed use at the site and the suitability of the soils for remediation purposes confirmed. This suitability assessment will include Waste Acceptance Procedures comprising: • Basic characterisation; • Compliance testing; and • On-site verification.
IE Licence (Reg No. P1086-01)	IE Licence Condition 8.7	Waste Disposal	Waste for disposal/recovery off-site shall be analysed in accordance with *Schedule C: Control & Monitoring* of the IE Licence (Reg No. P1086-01).
IE Licence (Reg No. P1086-01)	IE Licence Condition 10.8.3	Waste Acceptance	Waste accepted at the installation shall be limited to the waste types set out in *Schedule A2: Waste Acceptance* of the IE Licence (Reg No. P1086-01).
Air Quality, Odour and Climate Mitigation Measures	A1	Air Quality – Dust	The CEMP will contain a Dust Management Plan which will be formulated for the Remediation Phase of the proposed Project, as the planned activities are likely to generate some dust emissions. The principal objective of the Dust Management Plan will be to ensure that dust emissions do not cause significant nuisance at receptors in the vicinity of the proposed Project. The Dust Management Plan shall address the following: • The appointed contractor for the remediation works will be assigned with overall responsibility for Dust Management reporting back to the KCC Site Manager; • The design, and in particular the phasing of the Remediation Phase work will consider dust impact management and choose design approaches to minimise dust emissions; • The Remediation Phase will be carried out in Phases so that all of the works with significant potential for generating dust emission will not all occur simultaneously; • An effective training programme in dust management for site personnel will be implemented for the duration of the Remediation Phase; • A strategy for ensuring effective communication with the local community will be developed and implemented; • A programme of dust minimisation and control measures will be implemented and regularly

Air Quality, Odour and Climate Mitigation Measures			reviewed; and • A monitoring programme will be implemented.
	A2	Air Quality – Dust	The areas on site which vehicles will be travelling on will be hard-surfaced where practicable thus significantly reducing the potential for dust emissions from the vehicles.
	A3	Air Quality – Dust	A wheel washing facility with water collection and filtering before any discharge to the surface water management system will be set up. Gate security staff will be briefed on inspection of vehicles for cleanliness ahead of leaving site. During the initial stages of site set-up, a mobile wheel washing vehicle will be available at short notice, if necessary. The use of a wheel wash facility at the entrance to the proposed Project will minimise the transfer of any dust onto the roads in the vicinity of the site; this will also minimise the potential for dust build-up on surfaces which could be blown across the site.
	A4	Air Quality – Dust	In order to minimise the potential for wind-generated emissions from storage of materials, the storage areas will be oriented in a favourable manner with respect to the prevailing wind to minimise the effects of wind blow on release of dust and particulate.
	A5	Air Quality – Dust	Fixed and mobile water sprays will be used to control dust emissions from material stockpiles and road and hardstanding surfaces as necessary in dry and/or windy weather.
	A6	Air Quality – Dust	A daily inspection programme will be formulated and implemented in order to ensure that dust control measures are inspected to verify effective operation and management.
	A7	Air Quality – Dust	A dust deposition monitoring programme will be implemented at the site boundaries for the duration of the Remediation Phase in order to verify the continued compliance with relevant standards and limits.
	A8	Air Quality - Odour	During the Remediation Phase the appointed contractor will work in accordance with the guidance provided in the National Guidelines for the prevention of Nosocomial Invasive Aspergillosis during construction/renovation activities (developed by a sub- committee of the Scientific Advisory Committee of the National Disease Surveillance Centre, 2002). Odour mitigation measures are discussed in the draft Odour Control Plan (OCP) for the proposed Project which will be finalised as part of the overall CEMP. A Draft OCP was formulated to inform the design process for this proposed Project and is included in Appendix A7.7 of the EIAR. Odour incidents are being minimised at the site through best practice and regular monitoring. Odour minimisation and prevention measures which are currently implemented and which will continue to be updated during the Remediation Phase will include: • Carrying out subjective odour assessments (sniff tests) and logging details of odorous emissions during daily and weekly site assessments, in accordance with EPA guidance; • Noting wind direction, temperature and barometric pressure on a daily basis; • Ensuring that landfill gas flaring is balanced and optimised to maximise gas collection from installed gas wells and flaring according to operational recommendations; • Investigating any odour that appears stronger than the normal emission; • Logging any odour complaints, and investigating circumstances on the day the complaint was made. This includes correlating wind direction and speed, barometric pressure, and whether any site

Air Quality, Odour and Climate Mitigation Measures			works were being carried out; and • Notifying nearby sensitive receptors prior to any works being carried out, that may disturb the waste body and cause odours to be released.
	A9	Air Quality – Odour	Minimisation of evaporation of odours will be promoted through adoption of the following measures: • Maintain an adequate supply of temporary cover material prior to any works commencing (e.g. clean topsoil, clay or liner membrane); • Any disturbance and exposure of odorous waste will be kept to the minimum practical duration; • The surface area of exposed waste will be kept to a minimum size at all times; • Temporary cover will be applied to all work areas as quickly as practicable; • The carrying out of major waste movements during hot weather when odours volatise most readily will be avoided; • Leaving open waste exposed in direct sunlight, which increases evaporation, will be avoided; • Water spray to lower the temperature of exposed waste, and inhibit evaporation will be used; • Screening of materials containing waste, unless adequately contained, will be avoided; and • Any waste containing material that has to be transported from one side of the site to another will be covered and contained during transport.
	A10	Air Quality - Odour	Planning of works to take place under suitable weather conditions for minimising odours will be actively implemented during the Remediation Phase. If unacceptable odours are generated from a particular activity it may be necessary to cover the exposed waste, and cease the activity until additional odour control measures can be put in place. This may include the provision of additional water bowsers, or waiting for cooler weather conditions. The appointed contractor will agree such measures with the KCC Site Manager.
	A11	Air Quality – Odour	Nearby sensitive receptors and local Community Liaison Group will be kept informed of the progress and plans regarding the Remediation Phase. Nearby sensitive receptors will be informed prior to any remediation works being carried out. They will be informed of the works phasing plan, and the locations of works planned for the duration of remediation works will be regularly updated and communicated. Where adverse metrological conditions coincide with works phasing that cannot be averted, residents will be informed of the heightened risk of short-term odour nuisances.
	A12	Air Quality – Odour	During remediation works there will be a requirement for monitoring of odour emissions from the site to be undertaken which shall include the following: • Frequent sniff sampling and logging of odour characteristics at the working face; • Frequent sniff tests at the site perimeter downwind from the working face; • Frequent sampling of specified compounds with colour indicator tubes specified at appropriately low detection ranges; • Frequent measurement of Total VOC concentrations using a FID (Flame Ionization Detector) handheld field detector; and • Regular sniff tests off-site near sensitive receptor locations.
	A13	Air Quality – Odour	If monitoring indicates higher than expected odour emissions, or impacts at sensitive receptors, additional mitigation measures will need to be implemented. If necessary, and in adverse conditions,

Air Quality, Odour and Climate Mitigation Measures			the works may have to be stopped and the workface contained with a temporary cover, until adequate mitigation can be assured. The appointed contractor will agree such measures with the KCC Site Manager.
	A14	Air Quality – Landfill Gas	Kildare County Council will continue to monitor the level of hydrogen sulphide in the landfill gas on a weekly basis as part of the active management of landfill gas at the site throughout the Remediation Phase of the proposed Project. If higher sulphur, and H2S, levels are detected in the landfill gas flare inlet during the Remediation Phase, then a suitable abatement system, likely to be an activated carbon filter, will be fitted to reduce the levels of sulphur reaching the flare.
Noise and Vibration Mitigation Measures	N1	Noise and Vibration	Prior to the commencement of any on-site works, the appointed contractor will be required to prepare a Construction Environmental Management Plan (CEMP) in agreement with Kildare County Council. The CEMP shall contain a stand-alone Noise and Vibration Management Plan (NVMP) which will detail how the appointed contractor will comply with the noise criteria set out in the EIAR and will deal specifically with on-site activities in a strategic manner to remove or reduce significant noise and vibration impacts associated with the remediation works. The NVMP will detail the provision and installation of the acoustic barriers, the best practice noise measures that the appointed contractor will adhere to on-site and the noise and vibration monitoring programme that the appointed contractor will undertake during the remediation works.
	N2	Noise and Vibration – Noise Sensitive Receptors (NSRs)	The appointed contractor shall be required to carry noise monitoring at NSR locations on a weekly basis and this shall be increased to continuous monitoring in agreement with the EPA and the conditions of the IEAL, once the remediation works begin to approach the NSR locations. The measured noise levels at the NSR locations will be assessed against the noise limits and will be used to assist the scheduling of works. The results the noise monitoring will be available in real time to the KCC Site Manager. The measured noise levels at the NSR locations will be assessed against the noise limits and will be used to assist the scheduling of works to ensure that the noise emissions from the various works are kept within the prescribed noise limits. The appointed contractor shall also be required to carry out vibration monitoring at the nearest NSR locations during sensitive phases of the remediation works and this data shall be reviewed daily to ensure the limits are being complied with.
	N3	Noise and Vibration – Noise Sensitive Receptors (NSRs)	The NVMP will detail the best practice measures to be adhered to at the site including but not limited to the following: • the correct positioning of the mounted breakers in Zone 2A during Phase 1 on-site works to minimise their combined impact - To ensure that the noise limits are met, mounted breakers shall be positioned well apart from each other when operating simultaneously in Zone 2A. Scheduling of works for Zone 2A will ensure that the mounted breakers are correctly positioned to ensure that the relevant criteria are not exceeded at the nearest NSRs; • the correct sequencing of the building up or taking down of stockpiles on-site - Best Practice shall ensure that the stockpiling will be carried out in a sequence where the stockpile is built up from the boundary nearest to the receptors and added to so that the stockpile can act as a barrier between the noise source and the nearest receptors as the works develop; • the careful management of the number of plant items in simultaneous operation when the works are

Noise and Vibration Mitigation Measures			close to the NSRs along L2005 Kerdiffstown Road and other key locations; • the careful positioning of heavy plant items, such as the waste compactor, to minimise the potential for ground borne vibrations to be generated.
	N4	Noise and Vibration – Noise Sensitive Receptors (NSRs)	The remediation works will be managed through the use of construction noise limits which the appointed contractor will be required to work within. Best practice control measures including choice of plant, scheduling of works on site, provision of temporary acoustic screening, on-site noise monitoring and other measures will be employed in order to ensure noise limits are not exceeded.
	N5	Noise and Vibration	Best practice noise management procedures for the control of noise and vibration from demolition and construction activities as presented in BS5228 will be followed. Such measures to be adhered will include the following: On-site Work Practices • Avoid unnecessary revving of engines and switch off equipment when not required; • Keep internal haul routes well maintained and avoid steep gradients; • Use rubber linings in chutes and dumpers to reduce impact noise; • Minimise drop height of materials; • Start-up plant and vehicles sequentially rather than all together; • Equipment shall be located away from noise sensitive areas, as much as is feasible; • Regular and effective maintenance by trained personnel shall be carried out to reduce noise and/or vibration from plant and machinery; and • Limit noisy construction works to 07:00 to 19:00 weekdays with Saturday working from 08:00to 16:30 unless otherwise agreed with the relevant authority. In addition to the above BS5228 recommendations, Section 10.3 of NG4 discusses the management of Waste Related Operations and includes the following mitigation measures which will also be adhered to at the proposed Project: • Employ noise reducing technologies, such as attenuators or enclosures, where practicable; • Ensure that noise control measures are maintained as per the manufacturers requirements; • Minimise the number of vehicles/heavy plant on the proposed Project at any one time; • Maintain vehicles in good order, employ the principles of preventive maintenance and undertake reference vehicle noise measurements at defined intervals; • Ensure that noisy vehicles are parked as far as possible from noise sensitive areas; • Ensure that drivers are aware of the potential for noise to cause annoyance/disturbance to local residents – they shall show due regard to this, particularly when entering and leaving the proposed Project (e.g. no unnecessary horn blowing), and • Consider the use of alternative varieties of reversing alarm with reduced noise output, such as ambient noise sensing alarms with variable volume or directional modulated alarms – these must be evaluated on a case-by-case basis and regard must be had to any health and safety issues that may arise.
	N6	Noise and Vibration – Quiet	Selection of Quiet Plant • In accordance with best practicable means, plant and activities to be employed on the proposed

		Plan	Project will be reviewed to ensure that they are the quietest available for the required purpose.
Noise and Vibration Mitigation Measures	N7	Noise and Vibration – Acoustic Screens and Barriers	Acoustic Screens and Barriers Acoustic screens are required to be erected in certain locations for the duration of the Remediation Phase works (refer to EIAR Figure 8.2 and Section 8.4.1 for more details). These screens shall be carefully positioned to be as effective as possible. In general, the barrier shall have no gaps or openings in the joins of the barrier material and the barrier material shall have a minimum mass per unit area of 7 kg/m2. The minimum height of the barrier shall typically be such that no part of the noise source will be visible from the receiving point. This will not always be possible and therefore the minimum recommended height is prescribed at 2.4m. The existing screening banks along the western boundary of the proposed Project will be supplemented to give additional noise protection to the private residences along the L2005 Kerdiffstown Road. This shall be done with the use of straw bales (or equivalent) as that is the most readily accessible and highly mobile screen type with very effective mitigation properties. The low-reflection acoustic screens required around the boundary of Zone 2A shall be solidly constructed of straw bales (or equivalent) and shall be of minimum 5m height. The locations for the erection of the acoustic screens are shown in EIAR Figure 8.2.
	N8	Noise and Vibration – Noise Control	Noise Control • Improved sound reduction methods, such as equipment enclosures shall be used (this is also addressed in Environmental Protection Agency (2016). Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (EPA,2016))
	N9	Noise and Vibration - Communications	Communications The appointed contractor shall continue the current engagement with local residents and stakeholders and will notify them before the commencement of any works forecasted to generate appreciable levels of noise or vibration, explaining the nature and duration of the works. Throughout the Remediation Phase there shall be distribution of information circulars by the appointed contractor informing people of the progress of works and any likely periods of significant noise and vibration. A nominated contact for any communications in relation to noise and vibration for the duration of the project remediation works and any queries, complaints or other formal correspondence regarding noise and vibration shall be appointed by the contractor. Any liaison with local residents will be undertaken in agreement with the KCC Site Manager.
	N10	Noise and Vibration – Monitoring	Monitoring The appointed contractor shall be required to carry noise monitoring at NSR locations on a weekly basis and this shall be increased to continuous monitoring in agreement with the EPA and the conditions of the IEAL, once the remediation works begin to approach the NSR locations. The measured noise levels at the NSR locations will be assessed against the noise limits and will be used to assist the scheduling of works. The results the noise monitoring will be available in real time to the KCC Site Manager. The measured noise levels at the NSR locations will be assessed against the noise limits and will be used to assist the scheduling of works to ensure that the noise emissions from the various works are kept within the prescribed noise limits. The appointed contractor shall also be required to carry out vibration monitoring at the nearest NSR locations during sensitive phases of the

			remediation works and this data shall be reviewed daily to ensure the limits are being complied with.
Landscape and Visual Mitigation Measures	LV1	Landscape and Visual	Prior to commencement of the Remediation Phase, the appointed contractor shall prepare a Construction Environmental Management Plan (CEMP). The CEMP shall contain these mitigation measures and plans identified in the EIAR and ensure that they are fully implemented during the Remediation Phase, to prevent or reduce the impacts identified in the impact assessment. The landscaping and planting proposals for the proposed Project will be subject to confirmation during the detailed design stage.
	LV2	Landscape and Visual	Landscape mitigation measures are indicated on the Landscape General Arrangements-Overall Layout drawing MDR1406-RPS-00-XX-DR-L-LA5001.
	LV3	Landscape and Visual - Planting	Tree and shrub planting will occur wherever practicable (Refer to the Landscape General Arrangements drawing). This will mainly occur in peripheral areas and site boundaries due to limitations as to where tree planting can take place so as not to compromise the integrity of the engineering capping system.
	LV4	Landscape and Visual - Pond	At the north-west end of the mound is a proposed pond to manage surface water runoff from this area of the site and this occurs adjacent to a patch of woodland contained within the neighbouring property of Kerdiffstown House. The area surrounding this pond will remain fenced off from the public providing an opportunity for ecological enhancement.
	LV5	Landscape and Visual - Swale	The swale proposed at the base of the eastern slope of Zone 1 will be outside of the capped area and will be planted with semi-mature parkland trees.
	LV6	Landscape and Visual - Planting	Perimeter tree and hedge planting will also be incorporated into the boundary treatment on the western side of the site. This will include amenity planting around the site entrance as well as native hedgerow screen planting to fill a short gap in the roadside vegetation adjacent to an existing residential dwelling on the eastern side of the Kerdiffstown road. Two patches of woodland planting in the form of whips and feathered trees will be provided at the south-eastern end of the site to expand and consolidate existing woodland areas that occur immediately adjacent to the site. The Landfill Infrastructure Compound located to the east of the public park entrance will be planted with trees and shrubs to screen the compound insofar as possible. It should be noted that all proposed woodland and hedgerow amenity and mitigation planting will comprise of native and naturalised species.
	LV7	Landscape and Visual - Wetland	Wetland ponds proposed for Zone 1A and central portion of Zone 4 will be planted up with a variety of wetland plants to benefit biodiversity.
	LV8	Landscape and Visual - Residential	For the three residential properties (REC006, REC007 and REC008) that will lose front boundary vegetation as part of the widening and realignment works, the local access road to the south of the site, new stonewall/fencing will be provided. Semi- mature tree and shrub planting will also be provided to the inside of the wall for additional screening and amenity purposes. These mitigation measures are subject to consultation with the property owners in question.

Archaeology, Cultural Heritage and Architectural Heritage Mitigation Measures	ARC1	Archaeology Heritage -Greenfield	The Contractor shall undertake archaeological works as set out in the Works Requirements.
	ARC2	Archaeology Heritage – Church Site	The Contractor shall undertake archaeological works as set out in the Works Requirements.
	ARC3	Archaeology Heritage – Wade Survey	The Contractor shall undertake archaeological works as set out in the Works Requirements.
	ARC4	Archaeology Heritage – Topsoil Stripping	The Contractor shall undertake archaeological works as set out in the Works Requirements.
Biodiversity Mitigation Measures	B1	Biodiversity	There are a number of key mitigation measures that will be undertaken in order to minimise the overall impact of the proposed Project. Prior to commencement of the Remediation Phase, the appointed contractor shall prepare a Construction Environmental Management Plan (CEMP). The CEMP shall contain these mitigation measures and plans identified in the following sections and ensure that they are fully implemented during the construction phase, to prevent or reduce the impacts identified in the impact assessment. The CEMP will include a Site Biodiversity Management Plan which will address the following as a minimum: • Badgers; • Bat (including the retained Leisler's maternity roost); and • Habitat including retention of habitats during Remediation Phase and the development of new habitats during the Operational Phase.
	B2	Biodiversity – Habitats and Flora	Any trees, scrub or hedgerows adjacent to, or within, the site boundary which are intended to be retained will be afforded adequate protection prior to remediation works commencing. Mitigation measure will be in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b), as follows: • All trees along the site boundary that are intended to be retained, both within and adjacent to the site boundary (where the root protection area of the tree extends into the site boundary), will be fenced off at the outset of works in the adjacent working area and for the duration of the remediation works in that area to avoid structural damage to the trunk, branches or root systems of the trees. Temporary fencing (post and rail) will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. In general, the RPA covers an area equivalentto a circle with a radius 12 times the stem diameter (measured at 1.5m above ground level for single stemmed trees, or above the root flare for multi-stemmed trees);

Biodiversity Mitigation Measures			• Where fencing is not feasible due to insufficient space, protection for the trees will be afforded by wrapping hessian sacking (or equivalent) around the trunk of the tree and strapping stout buffer timbers around it; • The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) will not be undertaken within 10m of any retained trees, hedgerows and treelines; • If construction activities are required within the RPA, e.g. excavation work, then a qualified arborist will advise on the best methods for protecting the tree. For example, any excavation works carried out within the RPA will need to avoid damage to the protective bark covering larger roots. This may involve excavation by mini-digger and/or hand as deemed appropriate. Exposed roots will be wrapped in a hessian sacking to avoid desiccation and roots less than 2.5cm in diameter can be pruned back to a side root. The advice of a qualified arborist will be sought if larger roots that influence anchorage need to be severed. Any remedial works required to trees will be carried out by a qualified arborist; and Where tree removal may be required (due to health and safety considerations) in areas not previously identified liaison with a suitably qualified ecologist will be required.
	B3	Biodiversity – Habitats and Flora	If the appointed contractor is required to work within 7m of a Japanese knotweed infested area an invasive species specialist will be appointed. The invasive species specialist will identify the extents of Japanese knotweed and provide recommendations to the appointed contractor on what measures may be required to remove or avoid spreading this invasive species. This would need to be detailed in the Invasive Species Management Plan which will be developed as part of the CEMP. Any mitigation strategy in relation to invasive plant species will be based on the Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (National Roads Authority, 2010a). The following non-exhaustive measures shall be included in the Invasive Species Management Plan: • Works including access will need to avoid disturbing the Japanese knotweed or potentially contaminated soil within at least 7m of the infested area. • If works cannot be avoided within the exclusion zone the Japanese knotweed and contaminated soil will need to be treated and/or excavated and potentially removed off site or buried on site under licence from the NPWS, this would be detailed in the Invasive Species Management Plan. **Post-EIAR Note: Further Japanese Knotweed has been identified on site and existing treatment is currently ongoing.**
	B4	Biodiversity – Badger	Badger Pre-construction surveys for badger will be undertaken prior to commencement of remediation works to assess the status of the existing setts and any potential newly established setts as specified in the Wildlife Act Licence (DER/BADGER 2017-92) as granted by NPWS – licence has been provided to NPWS as part of the confidential badger report. The findings of these surveys will inform any updates to the derogation licence. The mitigation measures described below follow the recommendations set out in the Guidelines for the Treatment of Badgers during the Construction of National Road

Biodiversity Mitigation Measures			Schemes (National Roads Authority, 2006c). The location containing the main sett will be retained and as such, the permanent removal of the sett as a result of remediation activities will not occur. The subsidiary sett will be removed prior to remediation works to facilitate remediation and installation of the engineered capping system. The mitigation measures that apply in relation to each badger sett within the ZoI are discussed below.
	B4A	**Biodiversity – Badger**	**Badger** **Post-EIAR Note: A licence application "to interfere with breeding & resting places of badger" was made to the Department of Culture, Heritage and the Gaeltacht in June 2019, which sets out further mitigation measures in relation to the construction of a new artificial badger sett that will need to be incorporated into the site biodiversity management plan and supersedes certain measures outlined in the EIAR.**
	B5	Biodiversity – Badger	Badger Prior to remediation works commencing within the vicinity of the main sett all site personnel will be given a Toolbox talk where they will be briefed on the presence of the sett and the legal protection that badgers, and their setts, are afforded.
	B6	Biodiversity – Badger	Badger - Closure of Subsidiary Sett Prior to commencement of remediation works in this area and the closure of the sett, the log pile immediately adjacent to the sett will be removed under licence and supervision by a suitably qualified ecologist. Any additional sett entrances identified will be gated as part of the exclusion. Prior to closure the sett will be assessed to determine the use of each hole. Any holes that appear to be disused will be soft-blocked (backfilled with earth and vegetation) and then hard-blocked and proofed to prevent badgers digging back into the sett. Badger gates will then be fitted to all of the used holes on the sett. Sett exclusion will be carried out over a minimum period of 21 days, with the setts being monitored every three days. This will provide information on whether the badgers are still active at the sett. Camera traps will be placed facing the most well used entrance hole, in order to establish that the badger gates are working correctly and are preventing the badgers from re-entering the sett. In order to monitor all other holes where cameras have not been placed, small sticks will be leant in front of the gate to enable an assessment of badger activity. Monitoring will also confirm that the gates are functioning properly. Once there is certainty that all badgers have been excluded from the sett the gates will be locked permanently stopping any access into or out of the sett. Standard guidance (NRA 2006) states that a sett should be destroyed as soon as the exclusion has been completed. However, the standard methods usually employed for safe destruction of a sett will not be feasible in this instance. The sett is located within a steep sandy bank, located on the northern perimeter of the site and is considered to extend in a northerly direction into lands beyond the site. Assessment has shown that the bank could become destabilised and collapse if the sett tunnels and chambers were to be excavated. Furthermore, there is very high risk of the bank including mature trees (one of which contains a bat roost) collapsing using standard methods for destruction of the sett.

Biodiversity Mitigation Measures			The remediation works required at this area of the site will comprise backfilling and raising up to be almost level with the existing bank; as such the sett will be buried as part of the remediation works. Rather than destroying the sett it is proposed to leave the gates on for the duration of the works until this area is infilled. The gates would be left in place and the bank covered with wire mesh to prevent badger digging back in. The area immediately surrounding the sett will also be fenced off with mammal proof fencing and vegetation in the vicinity removed to make it less favourable to badger. The area would be monitored once a month to ensure that the gates/mesh and fencing are all in proper working order.
	B7	Biodiversity – Badger	Badger- Measures to Minimise Disturbance to Main Sett The following lists of mitigation measures are to be undertaken during remediation works in the vicinity of the main sett to minimise disturbance within retained habitat areas immediately adjacent to the site. These measures will be incorporated into the relevant contract documents: • Any works within 30m of the sett will be supervised by a suitably qualified ecologist (extended to 50m during the breeding season). A 30m buffer will be demarcated around the sett, using barrier tape. Where any works are planned in the vicinity of these exclusion zones (and where they could encroach into same the ecologist will be contacted prior to any such works. The ecologist willensure that the appointed contractor is complying with the mitigation measures outlined below. • Night-time working will be restricted as far as possible within 100m of the sett. As badgers are nocturnal, disturbance will be reduced by restricting the amount of night-time working within the vicinity of sett. Night-time, in terms of badger nocturnal activity, is defined as beginning onehour before sunset and lasting to one hour after sunrise; • The use of noisy plant and machinery in the vicinity of badger setts will cease before sunset; If the works involve excavations they will either be covered (with plywood), fenced or have an escaperamp installed overnight to prevent badgers, or other wildlife, from falling into them and becomingtrapped; • Any borrow pits or spoil heaps will be sited at a minimum distance of 30m from setts; • Chemicals shall not be used within 20m of a badger sett; and • Mammal proof fencing to be installed in the vicinity of the sett will be hand dug under supervision. A licence has been granted by the NPWS to enable the Remediation Phase works. The licence allows for the monitoring of the setts prior to commencement of remediation works, for exclusion of the subsidiary sett, for the installation of the fence line and to permit works within the distancebands described above. Works within the distance bands described above will only be carried out during daylight hours so as not to disturb foraging badgers.
	B8	Biodiversity – Other Mammals	Other Mammals (Pygmy shrew and Hedgehog) There is no known method for excluding pygmy shrew or hedgehog from nest / hibernation sites and therefore the seasonal clearance of vegetation for breeding birds (as described below) will be implemented. This means vegetation clearance works will avoid the period 1 March – 31 August as far as practicable; a significant portion of the main breeding season for both species. This mitigation will simultaneously avoid the majority of the main breeding season for most small mammal species (Hayden & Harrington 2001).

Biodiversity Mitigation Measures	B9	Biodiversity - Bats	Bats Three properties (REC010, REC011 and REC016) will be demolished during the Remediation Phase of the site. These private properties and surrounding gardens were not accessed during the initial bat assessment and surveys. Daytime bat assessments and potential further roost surveys of these properties and trees will be required to be undertaken by a suitably qualified ecologist prior to them being demolished. If a bat roost is identified the roost will be removed under licence from the NPWS and appropriate mitigation implemented per the licence requirements. The lighting design principles will be avoidance of lighting within particularly sensitive areas. Measures to mitigate the impact of lighting disturbance on bats during the Remediation Phase will include: • Avoid lighting of retained habitats, particularly in the vicinity of woodland, boundary treelines and the confirmed roost. This will ensure that important roosting, foraging and commuting corridors are maintained; • Lighting if required shall be of a low height (as low as possible without compromising safe working standards) to ensure minimal light spill and where feasible timers or motion sensors shall be used to ensure areas are retained in darkness as much as possible. Lighting shall be directed to where it is required only and this can be achieved by fitting louvres to the lighting; and • White LED or amber coloured LED lighting will be used as this is considered to be relatively low impact in comparison to other lighting types as it is less attractive to insects and as such insects will not be diverted away from darker areas where more sensitive bat species will be foraging.
	B10	Biodiversity – Breeding Birds	Breeding Birds Vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed between the 1 March and 31 August, to avoid impacts on nesting birds. Although the Wildlife Acts provide an exemption from this seasonal restriction to vegetation removal for some construction activities, there is no exemption provided for the destruction of nest sites. It is recognised that the remediation works are to be phased, hence vegetation clearance will not be undertaken across the entire site in one operation but will be targeted based on appropriate working areas that can be controlled and managed. Where the remediation programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Where nests are present, an ecologist will make a decision as to whether a licence is required for vegetation removal. Alternatively, the ecologist can demarcate a suitable buffer around an active nest and clearance within this area will be postponed until the chicks have fledged. A suitable exclusion zone will be established dependent on the species identified. Areas found not to contain nests must be cleared within three days of the inspection; otherwise repeat inspections will be required. If vegetation is to be cleared in the breeding season (under supervision of an ecologist) it will be chipped, removed or covered (ideally) on the same day to prevent birds from nesting.
	B11	Biodiversity – Amphibians and	Amphibians and Reptiles Areas of suitable reptile habitat such as grassland will initially be cut to 10cm high in order to avoid harm to any reptiles should they be present. This will be carried out by hand using hand tools, or if

Biodiversity Mitigation Measures		Reptiles	machinery is used, this will be set to a height of 10cm as advised by a suitably qualified ecologist. Refugia such as log piles will be cleared in warmer months (typically April – September) when reptiles are active. Newly created habitat can be enhanced for reptiles, which will entail provision of artificial hibernacula (see Appendix A11.4, Photo 11.7). Newly created hibernacula will be south- facing and free-draining. If works to clear the existing waterbodies are to be undertaken during the season where frogspawn / tadpoles may be present (February – July) a pre-construction survey will be undertaken to determine whether breeding amphibians are present. If found to be present, the species will be removed by hand net and translocated to the nearest available habitat that is suitable, under licence from the NPWS. There is an abundance of suitable receptor habitat in the immediate locality including ponds located within Kerdiffstown House adjacent to the site. A licence has been granted by the NPWS (Refer to EIAR Appendix A11.8) to enable the removal of frog spawn prior to remediation works should it be required.
	B12	Biodiversity – White-Clawed Crayfish	White-Clawed Crayfish Mitigation measures to protect water quality during the Remediation Phase are detailed in EIAR Section 13.6.1. The mitigation approach to protect the white-clawed crayfish during the proposed work is to undertake capture and relocation of individuals immediately prior to undertaking the construction of the outfall, following pre-construction surveys to confirm the presence of white-clawed crayfish in the vicinity of the outfall and associated works. As the mitigation approach will require the capture of crayfish and the potential disturbance of refuges, it will require a licence from the NPWS. As these works are proposed for year three of the Remediation Phase a licence has not yet been sought. This will be applied for by KCC (or a nominated representative) prior to the works being undertaken. Capture and translocation if required will be undertaken between July – September (to avoid the sensitive period for fish). All works will be undertaken in line with the following documents: • Guidance on works affecting white-clawed crayfish (Peay 2000); • Guidance on Habitat for White-clawed crayfish and its restoration (Peay 2002); and • Conservation management of the white-clawed crayfish, (Austropotamobius pallipes)(Reynolds 2010).
	B13	Biodiversity – Fish (Salmonids and Lamprey)	Fish (Salmonids and Lamprey) All works will be carried out in accordance with the requirements of IFI as set out in Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016). If instream work outside July-September period is required these shall be agreed in writing with IFI. The following measures will be implemented to mitigate the potential impacts to fish species: • Maintaining water quality in the surface water network • Maintaining fish passage while the outfall is being constructed. Only a small section of the river may require to be de-watered using sandbags or similar, hence a continuous flow will be maintained around the de-watered area; • Prior to dewatering the area will be electrofished and fish will be placed upstream of works; and Instream works will only be carried out during the period July - September (inclusive).

Soils, Geology, Contaminated Land and Groundwater Mitigation Measures	GW1	Soils – Landfill Gas	The potential impact from landfill gas to off-site human health receptors is significant and mitigation measures are required. These mitigation measures are provided in the Landfill Gas Management Plan (EIAR Appendix A4.5) which sets out the likely requirements for gas mitigation measures and monitoring to be undertaken by the appointed contractor during the remediation works (subject to agreement with the regulatory authorities and specified in the IEAL). During the works additional or replacement interim gas controls may need to be installed in agreement with KCC to ensure the risk of lateral off-site migration is not increased.
	GW2	Soils – Landfill Gas	The proposals for gas monitoring will need to be bespoke for the remediation works in order to assess the changing nature of the site and associated impacts from gas migration. Throughout the period of remediation works monitoring of all off-site boreholes shall be conducted at least monthly. During active remedial works, or where materials are moved to uncapped areas of wastes for temporary storage, more frequent monitoring of off-site boreholes adjacent to affected areas is likely to be required. Frequency will be determined by the risk assessment produced by the appointed contractor for each phase of works and incorporated within their method statement for working.
	GW3	Soils – Landfill Gas	The installation of gas extraction wells within the site as works progress will be in a phased manner, moving from zone to zone as the active remediation works move around the site. Details of the gas control measures and monitoring that will be in place for the Remediation Phase are provided in the Landfill Gas Management Plan (EIAR Appendix A4.5).
	GW4	Groundwater	Groundwater quality monitoring will be undertaken during the Remediation Phase to ensure that potential negative impacts are not occurring in the groundwater. The boreholes and analytical suite to be used will be agreed with the regulatory authorities and will be specified in the Industrial Emissions Activities Licence (IEAL) for the site. The monitoring will be based on results of ongoing baseline monitoring. The need for installation of new boreholes (which may be required if existing boreholes are to be lost as part of the remediation works) will be considered and if required new boreholes will be installed prior to the remediation works starting. The results of this monitoring will be reported to the EPA to comply with the conditions of the IEAL.
Water – Hydrology Mitigation Measures	H1	Water – Hydrology	Prior to commencement of the Remediation Phase, the appointed contractor responsible for the remediation works shall prepare a Construction Environmental Management Plan (CEMP) for agreement with KCC. The CEMP shall contain the mitigation measures and plans identified in the EIAR (as a minimum) and shall implement the conditions set out in the planning approval and the requirements of the site's Industrial Emissions Activities Licence (IEAL). The appointed contractor shall also ensure that the CEMP is fully implemented during the Remediation Phase in agreement with KCC, to prevent or reduce the impacts identified in the impact assessment. All construction works shall be completed in line with reference to the guidelines outlined below where applicable, and specified in the CEMP: • 'Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes' (NRA, 2005); • CIRIA C648 'Control of Water Pollution from Linear Construction Projects: Technical Guide'

Water – Hydrology Mitigation Measures			(Murnane et al., 2006); • CIRIA C649 'Control of Water Pollution from Linear Construction Projects: Site Guide' (Murnane et al., 2006); • CIRIA C692 Environmental Good Practice on Site 3rd Edition (2010); • 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA, 2001); • 'IFI Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters' (IFI, 2016); and • UK Environment Agency: - PPG3 Use and design of oil separators in surface water drainage systems; - PPG5 Pollution Prevention Guidelines Works and Maintenance in/ or near Water; - PPG21 Incident Response Planning; - PPG22 Dealing with Spills; and - PPG26 Drums and Intermediate Bulk Containers.
	H2	Water – Hydrology	The first phase of the remediation works will include the removal of the site connection to the Canal Feeder Stream. Therefore, there will be no direct hydrological connection from the site to the Canal Feeder Stream during the Remediation Phase. Temporary construction surface drainage and sediment control measures will be in place before earthworks commence.
	H3	Water – Hydrology	There will be no direct hydrological connection from the site to the Morell River during the Remediation Phase. The surface water pond areas (to be utilised in the Operational Phase) will be used temporarily for the storage of run-off during the remediation works. These ponds will be lined. Further temporary ponds may be constructed at locations adjacent to working areas to assist with management of run- off if the phasing and timing works require additional storage volumes. These temporary ponds will also be lined. Therefore, any potentially contaminated run-off will be captured and contained and will not be discharged from the site. Water may be required for on-site purposes. Re-use on site will include dust suppression and irrigation where necessary (during periods of dry weather) and where the water has been appropriately tested for the intended use. Any waters confirmed to be contaminated and considered as unsuitable for treatment or reuse on site will require to be removed from the site via a road tanker or to sewer in agreement with Irish Water. The appointed contractor will be required to ensure that water is disposed of to a licenced treatment facility. Discharge to ground may be utilised via the soakaway in the north-west extents of the site (Zone 1A).
	H4	Water – Hydrology	The appointed contractor will be required to prepare an Erosion and Sediment Control Plan (ESCP) prior to commencing the remediation works. The ESCP shall be included in the CEMP. To prevent or reduce the amount of sediment or other polluting substances being released into watercourses, the ESCP will include the following measures to be implemented by the appointed contractor: • Provision of measures to prevent the release of sediment to the Morell River during the construction works (outfall construction to the Morell River, pipeline crossings beneath the Morell River, and road realignment works to include footpath and cycleway with drainage connecting to existing road

Water – Hydrology Mitigation Measures			drainage outfall). Measures will include but not be limited to a cofferdam, sediment fences, and silt curtain; and • Provision of exclusion zones and barriers (sediment fences) between earthworks (re-profiling of slopes), stockpiles and temporary surfaces and watercourses to prevent sediment washing into the watercourse. No waste material including wastewater, will be permitted to discharge into any watercourse during the works.
	H5	Water – Hydrology	During the Remediation Phase there will be a requirement to expose existing waste, which may allow the infiltration of rainfall to the waste and result in contaminated run-off. To minimise this effect, works will be managed by the appointed contractor through a number of on-site operations, including: • Working in discrete areas to minimise the area of exposed waste; • Interception of any leachate outbreaks identified during waste excavation and re-profiling activities; • Provision of daily cover to exposed wastes, occurring as part of the remediation works; and • Progressively remediate the site with a landfill cap. These measures will be detailed by the appointed contractor in the ESCP.
	H6	Water – Hydrology	Cleaning of roads to reduce mud and dust deposits will be carried out away from watercourses.
	H7	Water – Hydrology	Any pouring of cement for the provision of the outfall and/or pipeline crossings for the works will be carried out in the dry and allowed to cure for 48 hours before re-flooding. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to surface water.
	H8	Water – Hydrology	No storage of hydrocarbons or any toxic chemicals will occur within 50m of a watercourse. Fuel storage tanks will be bunded to a capacity of at least 110% of the volume of the storage tank. Re- fuelling of machinery will not occur within 50m of any watercourse and only in bunded refuelling areas. Emergency procedures will be put in place and construction staff will be familiar with emergency procedures.
	H9	Water – Hydrology	The appointed contractor shall consult with IFI in relation to the ESCP and shall include their requirements in this regard.
	H10	Water – Hydrology	The detailed design of works within and adjacent to watercourses (e.g. directional drilling beneath the Morell River for the new pipeline crossings; construction of the new outfall to the Morell River from the surface water ponds) will be undertaken with input from a hydromorphologist. Such works will only be conducted during forecast low flow periods and shall be done in July to September. Following in-channel working (i.e. for the outfall and pipeline crossing) the channel cross-section will be reinstated as per pre-work conditions and tied into the structures.
	H11	Water – Hydrology	The appointed contractor will detail emergency measures to be implemented in the event of a spillage or accidental discharge. This Emergency Plan will form part of the overall ESCP incorporated as part of the CEMP to be prepared by the appointed contractor and agreed with KCC.
	H12	Water – Hydrology	Water quality monitoring will be undertaken as indicated in the Industrial Emissions Activities Licence (IEAL) as agreed by the EPA and this will be supported by a Monitoring and Control Management Plan.

Water – Hydrology Mitigation Measures			The IEAL will require the licence holder (KCC) to undertake a monitoring regime to include the Morell River, with key pollution indicators analysed on a regular basis from locations up and downstream of the site. The results of this monitoring will be reported to the EPA to comply with the conditions of the licence. In addition, daily visual inspections of the surface drainage and sediment control measures and the watercourses will be undertaken by the KCC Site Manager or nominated representative. Indicators that water pollution may have occurred include the following: • Change in water colour; • Change in water transparency; • Increases in the level of silt in the water; • Oily sheen to water surface; • Floating detritus; or • Scums and foams. These inspections shall be recorded. In the event that such indicators are observed, review of site works will be undertaken to determine potential linkage. Where a potential linkage is determined an investigation of the potential cause will be undertaken by the appointed contractor. The above monitoring will allow KCC to be assured that the mitigation measures employed by the appointed contractor are successfully operating.
Traffic and Transport Mitigation Measures	TT1	Traffic and Transport	Prior to commencement of the Remediation Phase, the appointed contractor shall prepare a Construction Traffic Management Plan (CTMP). The purpose of the CTMP is to set out management and mitigation measures to prevent or minimise the transport impacts during the Remediation Phase of the proposed Project. The CTMP shall include details of the following: • Identify to all staff and contractors the appropriate and safe routes to and from the proposed Project; • Confirmation that routing of HGV traffic is not permitted via Sallins, all Remediation Phase HGV traffic will route via the N7 Junction 8; • Timing of HGV movements to take place outside of peak flow hours, where practicable, in order to minimise disruption to general traffic flows on the road network, including details of delivery windows confirming when traffic is predicted to arrive on-site; • Consideration of location of weighbridge within the site in order to minimise queueing of site traffic on the L2005 Kerdiffstown Road; • Measures to ensure access to all private properties along the L2005 Kerdiffstown Road is maintained throughout the Remediation Phase works; and • Appropriate warning signs to be erected to warn other road users of the presence of HGV's and general Remediation Phase related traffic. Through the CTMP, regular engagement with the existing Community Liaison Group shall be undertaken in order to engage with the local residents on when remediation works will commence, including;

Traffic and Transport Mitigation Measures			• The schedule of works; • Disseminate details of signage • The direction from where HGV loads will be travelling from; • A dedicated telephone number which the residents can contact to report any issues; • Provide details of the dates of the community liaison group meetings; and • Obtain local resident's feedback on other issues that need to be addressed including details of any forthcoming public events etc. that need to be considered. The CTMP shall provide for regular inspections to be carried out to ensure that agreed mitigation measures, as outlined above, are being undertaken.
	TT2	Traffic and Transport	The appointed contractor responsible for the remediation works will be required to undertake a pre- condition survey of the existing road from the N7 to the site with the scope and method of assessment to be agreed with KCC Transportation Department. Following completion of the importation works, a further survey will be undertaken to determine any deterioration and the requirement for any remedial works, for agreement with the KCC Transportation Department.
	TT3	Traffic and Transport	A Mobility Management Plan (MMP) shall be prepared by the appointed contractor prior to initiation of the Remediation Phase, the purpose of which is to provide the mechanism to support and promote sustainable travel for staff, contractors and visitors travelling to the proposed Project. The MMP shall seek to eliminate where feasible the barriers preventing users of the site from accessing via sustainable travel modes, improving travel choices and managing single occupancy car use.
Waste Mitigation Measures	W1	Waste – Excavated Materials	It is estimated that all of the material excavated during re-profiling works will be reused on-site as part of the remediation of the site. Inspections will be undertaken of the material to ensure suitability for reuse and any opportunity for processing to achieve other uses on site. Should any waste material be suspected to be non-compliant, the appointed contractor will be required to quarantine that waste by constructing a perimeter bund and placement of a tarpaulin or other suitable cover over the waste until such time as testing is undertaken and waste classification confirmed. In the event that any of the excavated material is deemed to be hazardous, it will be removed for disposal by a licenced waste contractor to a suitably licenced facility.
	W2	Waste – Demolition	With respect to the demolition of the on-site concrete structures, the rebar will be removed from the site for reuse or recycling. The appointed contractor will be responsible for the compliant management of the waste rebar. The concrete which arises from the demolition of the concrete structures will be crushed and reused on-site. Waste arising from the demolition of the three properties which fall under CPOs will be managed by the appointed contractor in accordance with the Construction Environmental Management Plan (CEMP).
	W3	Waste	Waste tyres currently used to anchor the temporary geosynthetic capping in Zone 3, will be removed off-site for reuse or recycling. These will be managed by the appointed contractor in accordance with the CEMP.
	W4	Waste	Materials which will require to be imported to the site to facilitate the remediation works will be appropriately sourced and managed to ensure that the material is of suitable engineering grade for

Waste Mitigation Measures			the proposed Project. In so far as is possible, materials will be ordered within a reasonable timeframe of when they will be required on-site. This should prevent waste being generated through over- ordering, or through materials degrading due to long periods of storage on-site prior to use.
	W5	Waste	Where material needs to be stockpiled within the site the appointed contractor will be responsible for management of the stockpiles in accordance with the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (DEFRA 2009) to ensure that surface water and groundwater are protected from contamination and these provisions will be detailed in the CEMP. Please refer to Chapter 4 Description of the Proposed Project for further information and requirements on stockpile management. As a minimum stockpile management will include: • Visual screening for potential contaminated materials; • Segregation of material suspected to be contaminated from clean materials; • Stockpiling of materials at appropriate heights / batters to prevent potential instability; • Protection of stockpiled materials from scour / erosion; • The provision of adequate drainage to limit and control potentialcontaminated surface water runoff, including silt mitigation; and • The avoidance of un-necessary trafficking / handling of stockpiled materials. With the exception of top soil (or soil forming materials), stockpile heights will be restricted to a maximum of 4m to facilitate adequate management during the works. A reduced stockpile height of 2m will apply to any top soil / soil forming materials to prevent possible degradation of soil structure.
	W6	Waste	The appointed contractor(s) responsible for the remediation works will ensure that any facility to which waste is brought is licenced / permitted in compliance with waste management legislation and will obtain the appropriate certification of disposal / destruction of waste. Prior to commencement of the Remediation Phase, the appointed contractor shall prepare a CEMP. The CEMP shall contain the mitigation measures and plans identified in the EIAR and ensure that they are fully implemented during the Remediation Phase, to prevent or reduce the impacts identified in the impact assessment. The CEMP will outline measures and provisions for the management of waste during the Remediation Phase, and will take the following guidance documents into consideration: • Best Practice Guidelines on the preparation of Waste Management Plans of Construction and Demolition Projects, Department of the Environment, Heritage and Local Government, July2006; • CIRIA document C692 – Environmental Good Practice on site; • CIRIA document 133 Waste Minimisation in Construction; • National Hazardous Waste Management Plan 2014-2020; and • Guidelines for the Management of Waste from National Road Construction Projects, NRA2008.
	W7	Waste – Hazardous Waste	As well as hazardous wastes generated by the remediation works, there is a slight possibility of encountering some unknown hazardous waste during the remediation works. If such waste types are uncovered, further investigation, testing and risk assessment will be undertaken to determine the appropriate actions to be taken with regards to compliant removal and disposal of such waste.

Waste Mitigation Measures			Materials identified as hazardous will be required to be suitably disposed of in a licenced hazardous waste disposal facility. Where practicable, the closest suitable facilities to the proposed Project will be selected to reduce impacts associated with vehicle movements such as air emissions and noise. There are no facilities within County Kildare which accept hazardous wastes. There are a number of facilities located in Dublin, the closest of which is Rilta which is approximately 17km from the proposed Project. There is also an Enva facility in Dublin which is approximately 25km from the proposed Project. Enva also have a facility in Portlaoise for the treatment of contaminated soils, which is approximately 60km from the site of the proposed Project. Any such material will be managed in accordance with waste management legislation and the following requirements: • Excavation will be targeted and stockpiling will be managed in order to prevent potential contaminants from being released into the surrounding environment; • All hazardous waste will be segregated from non-hazardous waste, with different types of hazardous waste being segregated from each other if safe to do so. Each hazardous waste storage location will be clearly signposted stating the type of waste and that it is hazardous; and • A Waste Transfer Form (WTF) will be used to record the transportation of hazardous waste within the State and will be required of any movements of hazardous waste arising during construction of the proposed Project. Should the need arise for the Transfrontier Shipment (TFS) of waste, the movement between countries is subject to control procedures under the EU and national legislation and guidance, such as the Waste Management (Transfrontier Shipment of Waste) Regulations, 2007. The appointed contractor, as the waste producer, will be responsible for ensuring the compliant disposal of all wastes during the Remediation Phase of the proposed Project, and as such will be required to retain records of all hazardous wastes. Kildare County Council will monitor that all waste arising as part of the Remediation Phase is handled and disposed of compliantly by the appointed contractor as per these requirements. Copies of all testing will be retained by the KCC Site Manager.
	W8	Waste – Leachate and Effluent	During the Remediation Phase of the proposed Project, the management of leachate and effluent will need to be maintained at the baseline levels at a minimum. The Leachate Management Plan (Appendix A4.4) will be implemented to ensure continued collection and compliant disposal of leachate being generated from the site. The Leachate Management Plan outlines leachate management proposals throughout a number of different stages of the remediation works. These include: • Operation in discrete areas to minimise the area of exposed waste; • Interception of any leachate outbreaks during waste excavation or re-profiling activities; • Provision of daily cover to exposed wastes; and • Progressively remediate the site with a landfill cap. Discharge of run-off during remediation works will not be permitted as per the Surface Water Management Plan (EIAR Appendix A4.6), with ponds lined with geomembrane liner to offer additional protection to groundwater during this period. Should a situation arise where run-off levels are

			becoming higher than can be adequately collected and maintained within the site, the collected water will be tankered off-site by a suitably licenced contractor for disposal at a suitably licenced facility. The leachate pipeline and Landfill Infrastructure Compound shall be built during the early Phases of the remediation works, allowing for the leachate collected in Zone 3 to be discharged from the site through the new system to the Johnstown Pumping Station. The appointed contractor will be responsible for ensuring the compliant management and disposal of leachate during the Remediation Phase of the proposed Project.
Population and Human Health Mitigation Measures	P1	Population and Human Health – Amenities and Recreation	Amenities & Recreation • During the Remediation Phase of the proposed Project, mitigation as detailed in EIAR Chapter 7 Air Quality, Odour and Climate, Chapter 8 Noise and Vibration and Chapter 9 Landscape and Visual will be implemented. This shall include the development of a CEMP by the appointed contractor. • The Kildare County Council Project Team with the appointed contractor will continue to communicate with the local residents, including the Community Liaison Group, as well as local recreation providers/local community. These communication channels will allow local groups to keep future visitors up to date on the proposed Project as well as providing an avenue to raise concerns or issues during this Phase of the project.
	P2	Population and Human Health – Amenities and Recreation	Community Severance & Accessibility • The appointed contractor will be required to maintain access to residential and commercial properties throughout the Remediation Phase.
	P3	Population and Human Health – Amenities and Recreation	Employment • The potential employment opportunities associated with the Remediation Phase are positive impacts, albeit in the short-term, however such impacts require no mitigation. • In relation to employment centres in direct proximity of the site, a CEMP shall be developed by the appointed contractor which shall implement appropriate measures to minimise impacts from Remediation Phase works (directly on site and in the realignment of the L2005 Kerdiffstown Road).
	P4	Population and Human Health – Land-Use	Land-Use • Access to areas subject to the temporary CPO process will be maintained throughout the Remediation Phase to ensure severance and community access issues are not a factor. Areas subject to the temporary CPO process will also be returned to their approximate previous state after necessary works are completed. • For the properties (REC006, REC007 and REC008), KCC will engage with the residents regarding appropriate fencing and screening along the realigned road at these properties to ensure the privacy of the residences during the Remediation Phase. This shall be undertaken by the erection of some form of additional wall or fencing and vegetative screening that would be agreed with the landowners in advance of the remediation works commencing.
	P5	Population and	Economy & Tourism

Population and Human Health Mitigation Measures		Human Health – Economy and Tourism	• During the Remediation Phase the proposed Project shall look to procure material and services from local providers, where reasonably practicable, and within the requirements of the procurement process. This would encourage additional economic activity in the local economy which may subsequently result in indirect employment opportunities being created.
Material Assets Mitigation Measures	MA1	Material Assets – Residential	The three properties to be demolished, as well as the areas of land required, shall be the subject to Compulsory Purchase Orders (CPOs), with the landowners to be compensated accordingly for the loss of the asset. A septic tank, of soakaway design, extends from property REC039 and discharges within the site boundary. This discharge will be removed and a sewer connection provided for this property.
	MA2	Material Assets – Utility Disruptions	All possible precautions shall be taken to avoid unplanned disruptions to any services during the Remediation Phase of the proposed Project. This shall include thorough investigation to identify the location of all utility infrastructure within the working area, and the implementation of robust procedures when undertaking works in and around known utility infrastructure such as overhead lines. Service disruptions impacting the surrounding residential, social and commercial properties shall be kept to a minimum, only occurring where unavoidable. Prior notification of disruptions shall be given to all impacted properties. This shall include information on when disruptions are scheduled to occur and the duration of the disruption. Consultation with relevant neighbouring parties shall be undertaken prior to any proposed disruptions. Specific mitigation measures are as follows: • Avoidance of interaction with overhead utility lines in and around the site; • Protection in place of all underground services for which diversion is not required; • Use of existing electricity, telecommunications and water connections where possible; • The surface water drain from the adjacent property shall be reconnected to the existing outfall to the Canal Feeder Stream outside of the site boundary, with the site connection removed; • Consultation and agreement in place with Irish Water on allowable quantities and acceptance criteria for the leachate and other wastewater to be discharged to the public sewer network; and • Pre-treatment of leachate (methane stripping) prior to disposal to the sewer to remove explosion risk within mains.
	MA3	Material Assets – Imported Materials	Where additional material is required for re-profiling and capping of the site, this material shall be imported. Only materials which meet suitable engineering grade shall be sourced as required. A number of key issues shall be considered as part of the selection process. These include source; material specification; production and transport costs; and the availability of material. Proposals for material management are to be set out in the Construction Environmental Management Plan (CEMP) for the proposed Project. Any material being imported to the site must be accompanied by a source report completed by the provider of the material, which will give the history of the material and the land from which it has been taken. Material shall only be accepted based on the information contained in the source report. No material shall be accepted to site without a suitable source report. The imported material shall be sourced locally as far as reasonably practicable in order to reduce the need for long distance transportation of the material. Possible future sources for this material may include nearby development sites