

Huntstown Inert Clay Facility W0277-02 Annual Environmental Report 2017



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1.0 Introduction

1.1 Scope And Objectives

This Annual Environmental Report (AER) is prepared for the Huntstown Inert Clay Facility (HICF) operated by Roadstone Limited. This AER covers the period from January 2017 to December 2017.

The Environmental Protection Agency (EPA) issued a waste licence to Roadstone Ltd., in respect of an inert waste recovery facility at Huntstown North Quarry, Finglas, Dublin 11 on 11th February 2015 (Current Licence Number: W0277-02).

This EPA licence under which the facility operates, specifies a number of environmental controls:

“in order to minimise the risk of environmental pollution and nuisance to the public arising from the activities at the facility”

Accordingly, the content of this AER complies with the requirements of the facility waste licence, and in particular the requirements presented in Schedule D of the waste licence (Schedule D requirements listed in Table 1). The report has a number of other objectives which include but are not limited to the following:

- It serves to update all stakeholders on the environmental controls, monitoring and reporting of emissions as detailed in ‘*Schedule B: Emission Limits*’ of the facility licence. These comprise the following;
 - B.1 Emissions to Air;
 - B.2 Emissions to Water;
 - B.3 Noise Emissions; and
 - B.4 Dust Deposition Limits.
- It documents the measures taken or adopted at site in relation to the prevention of environmental damage;
- It reaffirms the financial provisions which are in place in relation to the underwriting of costs for remedial actions following anticipated events or accidents / incidents; and
- It summarises the methods and procedures in place at the facility to ensure that Condition 8 of the facility licence – ‘*Materials Handling*’ is undertaken explicitly as directed by the facility licence.

Finally, the report follows the recommended guidelines in the ‘*Annual Environmental Report: Standardised Reporting Guidance For All IPPC And Waste Licences*’ document published by the EPA.

1.2 Structure And Content

Within the facility waste licence, the annual environmental report content which is required is presented in Schedule D. The table below presents these content requirements, and the sections in this report in which they are addressed.

Table 1: Schedule D, Annual Environmental Report Content ^{Note1}

Item	Section In This Report Where Item Is Addressed
Emissions from facility	Section 5
Waste management record	Section 6
Resource consumption summary	Section 10.5
Complaints summary	Section 10.3
Schedule of environmental objectives and targets	Section 4
Environmental management programme – report for previous year	Section 4
Environmental management programme – proposal for current year	Section 4
Pollutant release and transfer register – report for previous year	Section 3
Pollutant release and transfer register – proposal for current year	Section 3
Noise monitoring report summary	Section 5.1
Tank and pipeline testing and inspection report	Section 9
Reported incidents summary	Section 10.2
Bird survey report	Section 7
Energy efficiency audit summary	Section 11
Development / infrastructural works summary (completed in previous year or prepared for current year)	Section 10.1
Reports on financial provision made under this licence, management and staffing structure of the facility and a programme for public information	Section 13
Review of closure, restoration & aftercare management plan	Section 12
Statement of measures in relation to prevention of environmental damage and remedial actions (Environmental liabilities)	Section 13
Any other items specified by the agency	N/A

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

2.0 Site Description

2.1 Site History

The excavation and blasting of limestone has been undertaken at the Huntstown Quarry Complex for the past four decades following grant of an outline permission in or around 1969. It is understood that quarrying at the northern and central areas was commenced at some time in the early-to-mid 1980s on foot of a planning permission granted in 1982.

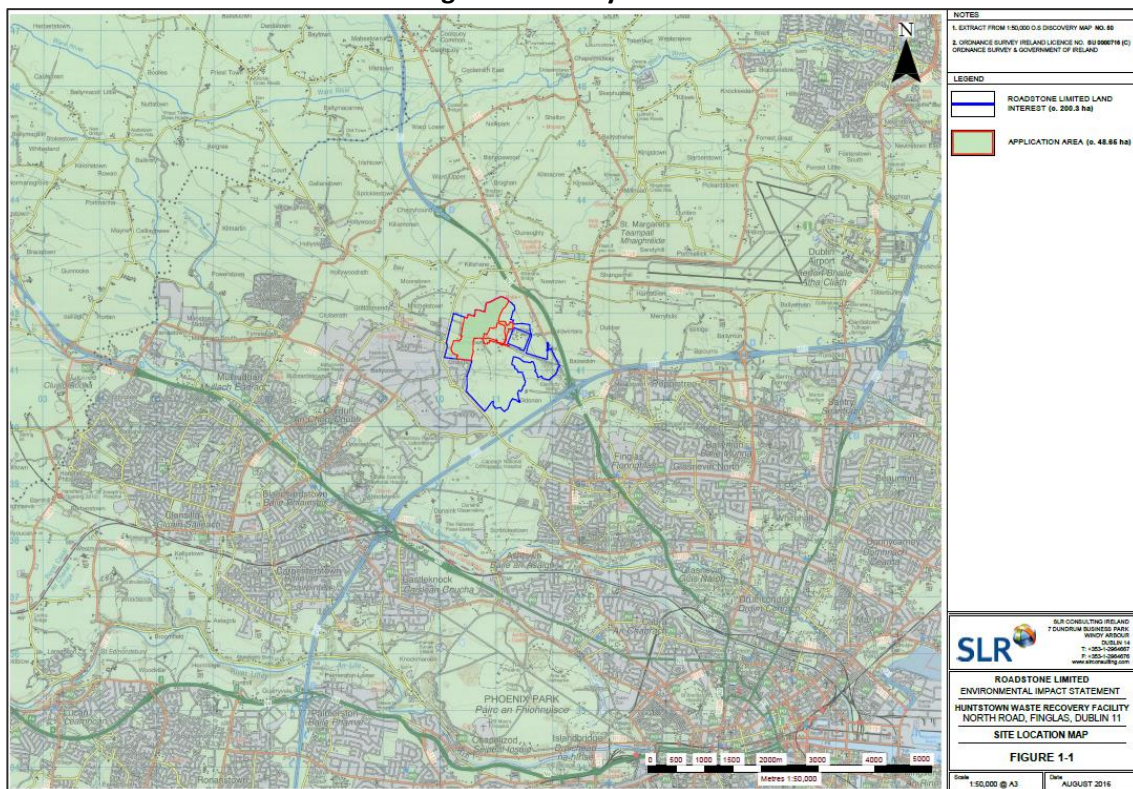
In August 2014, Roadstone secured planning permission for continuation of quarrying at its Huntstown Quarry complex for a further 20 year period (Fingal County Council Ref. No. FW12A-0022, An Bord Pleanála Ref. No. 06F 241693). The overall development proposal, which was subject to EIA, included provision for ultimate backfilling and restoration of the existing North, West and South Quarries and the planned Central Quarry to original ground level.

At the present time, backfilling and restoration of the North Quarry is proceeding in accordance with the existing planning permission and waste licence as described in the following sections. The maximum permitted material intake is currently 1,500, 000 tonnes per calendar year.

2.2 Facility Location And Layout

The licensed inert waste recovery facility is located entirely within the townlands of Huntstown and Kilshane, Co. Dublin which is situated approximately 2.5km north-west of the Dublin suburb of Finglas and 2km north-west of the interchange between the N2 dual carriageway and the M50 motorway. The site is accessed by the 'old' N2 road. The boundary of the lands owned by Roadstone Ltd., is shown on the ordinance survey map of the region in Figure 1.

Figure 1: Facility Location



The waste licence facility is contained within an active quarry operation and adjoining concrete and asphalt production facilities, which are also operated by Roadstone Ltd. The entire waste facility licence covers an area of approximately 36.1 hectares, while the footprint of the quarry void to be backfilled comprises one third of the total at approximately 12 hectares.

2.3 Legislative Framework

2.3.1 European Legislation

The Waste Framework Directive 98/2008/EC on waste sets out the general obligations for the collection, transport, recovery and disposal of waste. The Directive requires all member states to take necessary measures to ensure waste is recovered or disposed of without endangering human health or causing harm to the environment. This includes collection registration, permitting, registration and inspection requirements.

The directive is made up of a series of 27 Articles. Each has a different theme or topic covering environmental protection, waste definition, waste handling, waste movement etc. Article 13 addresses the protection of human health and the environment:

Member States shall take the necessary measures to ensure that waste management is carried out without endangering human health, without harming the environment and, in particular:

- a) Without risk to water, air, soil, plants or animals;*
- b) Without causing a nuisance through noise or odours; and*
- c) Without adversely affecting the countryside or places of special interest.*

2.3.2 Irish Legislation

The Waste Directive is implemented in Ireland by The Waste Management Act 1996, the Waste Management (Amendment) Act 2001 and the Protection of the Environment Act 2003. Up until July 2016, the Department of the Environment, Community and Local Government had overall responsibility for waste management policy. These functions have now been transferred to the Department of Communications, Climate Action and Environment. The Waste Management Act creates a series of waste authorisations appropriate to the level of risk and complexity of the waste activity. The waste licence for HICF (Ref. No. W0277-01) was issued by the Environmental Protection Agency (EPA) on 11th February 2015. This was reviewed in 2017 and the current licence under which the facility operates is W0277-02, and this annual environmental report complies with this most up to date licence version.

2.4 Waste Recovery Processes

As detailed in 'Schedule A: Limitations' of the facility licence the following waste recovery processes are authorised:

'importation, stockpiling and recovery of soil and stone through deposition for the purposes of quarry restoration.'

Quarry restoration using inert waste soil and stone is a recovery operation which does not have a clear assignment to recovery (R) codes, however, legislative reporting obligations have been defined for backfilling operations. The following waste activities are licensed onsite in accordance with the Forth Schedule of the Waste Management Act 1996 as amended:

- Class R 3. Recycling / reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes), which includes gasification and pyrolysis using the components as chemicals.
-

-
- Class R 5 (P). Recycling / reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials.
 - Class R 13. Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1), on the site where the waste is produced).

Additionally the waste licence authorises the following activities onsite:

- i. Backfilling of a total quantity of 9,450,000 tonnes of soil and stone and dredging spoil (note this does not include material required for final profiling as may be required by the Planning Authority and agreed by the Agency;
- ii. Separation of any non-inert construction and demolition waste (principally metal, timber, PVC pipes and plastic) unintentionally imported to site;
- iii. Transfer of any separated waste streams to a dedicated waste inspection and quarantine facility for temporary storage, pending inspection, testing and potential removal to off-site authorised waste disposal or recovery facilities;
- iv. Stockpiling and storage of imported topsoil pending re-use as cover material during final phase of restoration;
- v. Progressive restoration of the backfilled void (including placement of cover soils and seeding) and return to a natural grassland habitat; and

Environmental monitoring of noise, dust, surface water and groundwater for the duration of the proposed site restoration works and for a short aftercare period.

2.4.1 Inert Waste

Inert wastes do not biologically, chemically or physically degrade. Inert waste is defined in the Waste Management Act and the Waste Framework Directive:

"Inert waste means waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and / or groundwater."

2.4.2 EWC Codes Accepted

A European Union wide harmonised list of wastes (LOW) and accompanying coding system was established in June 2015. The different types of waste in the list are fully defined by a six digit code which identifies the source of the waste and the waste type. This ensures that the collection, transportation, storage and treatment of waste is carried out in a manner that provides protection for the environment and human health and in compliance with legal requirements.


Material which is acceptable for recovery at the facility, along with the accompanying EWC codes are shown in Table 2.

Table 2: Huntstown Licenced Waste Categories And Quantities

EWC Code	Waste Type	Maximum (Tonnes per calendar year)
17 05 04	Soil and stones other than those mentioned in 17 05 03	1,500,000
17 05 06	Dredging spoil	
20 02 02	Soil and stones	

The total amount of material licenced to be used to backfill the quarry is 9,450,000.

3.0 Pollutant Release And Transfer Register

 Environmental Protection Agency		PRTR# : W0277 Facility Name : Huntstown Inert Waste Recovery Facility Filename : W0277_2017.xls Return Year : 2017	
		Guidance to completing the PRTR workbook	
		PRTR Returns Workbook <small>Version 1.1.19</small>	
REFERENCE YEAR		2017	
1. FACILITY IDENTIFICATION			
Parent Company Name		Roadstone Limited	
Facility Name		Huntstown Inert Waste Recovery Facility	
PRTR Identification Number		W0277	
Licence Number		W0277-02	
Classes of Activity			
		No.	class name
		-	Refer to PRTR class activities below
Address 1		Huntstown Quarry	
Address 2		Huntstown	
Address 3		Kilshane and Johnstown Townlands	
Address 4		Finglas, Dublin 11	
		Dublin	
Country		Ireland	
Coordinates of Location		-6.33473017853.41561163	
River Basin District		IEEA	
NACE Code		3832	
Main Economic Activity		Recovery of sorted materials	
AER Returns Contact Name		Marie Kelleher	
AER Returns Contact Email Address		mkeller@roadstone.ie	
AER Returns Contact Position		HSE Officer	
AER Returns Contact Telephone Number		0217336336	
AER Returns Contact Mobile Phone Number			
AER Returns Contact Fax Number			
Production Volume		0.0	
Production Volume Units			
Number of Installations		0	
Number of Operating Hours in Year		0	
Number of Employees		5	
User Feedback/Comments		There were no rejected loads during 2017	
Web Address			
2. PRTR CLASS ACTIVITIES			
Activity Number		Activity Name	
50.1		General	
3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)			
Is it applicable?			
Have you been granted an exemption ?			
If applicable which activity class applies (as per Schedule 2 of the regulations) ?			
Is the reduction scheme compliance route being used ?			
4. WASTE IMPORTED/ACCEPTED ONTO SITE			
		Guidance on waste imported/accepted onto site	
Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?		Yes	
<small>This question is only applicable if you are an IPPC or Quarry site</small>			

3.1 Releases To Air

4.1 RELEASES TO AIR		Link to previous years emissions data			PRTR# : W0277 Facility Name : Huntstown Inert Waste Recovery Facility Filename : W0277_2017.xls Return Year : 2017			29/03/2018 10:12	
SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS									
RELEASES TO AIR					Please enter all quantities in this section in KGs				
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
						0.0	0.0	0.0	0.0
						0.0	0.0	0.0	0.0
						0.0	0.0	0.0	0.0
						0.0	0.0	0.0	0.0
						0.0	0.0	0.0	0.0
						0.0	0.0	0.0	0.0
ADD NEW ROW DELETE ROW * * Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button									
SECTION B : REMAINING PRTR POLLUTANTS									
RELEASES TO AIR					Please enter all quantities in this section in KGs				
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
05	Nitrous oxide (N2O)	C	OTH	EPA Calculation Toolset	8.8	8.8	0.0	0.0	
06	Ammonia (NH3)	C	OTH	EPA Calculation Toolset	0.5	0.5	0.0	0.0	
07	Non-methane volatile organic compounds (NMVOC)	C	OTH	EPA Calculation Toolset	220.0	220.0	0.0	0.0	
01	Methane (CH4)	C	OTH	EPA Calculation Toolset	3.6	3.6	0.0	0.0	
02	Carbon monoxide (CO)	C	OTH	EPA Calculation Toolset	696.9	696.9	0.0	0.0	
03	Carbon dioxide (CO2)	C	OTH	EPA Calculation Toolset	205400.0	205400.0	0.0	0.0	
08	Nitrogen oxides (NOx/NO2)	C	OTH	EPA Calculation Toolset	21315.0	21315.0	0.0	0.0	
11	Sulphur oxides (SOx/SO2)	C	OTH	EPA Calculation Toolset	208.0	208.0	0.0	0.0	
86	Particulate matter (PM10)	C	OTH	EPA Calculation Toolset	135.6	135.6	0.0	0.0	
ADD NEW ROW DELETE ROW * * Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button									
SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)									
RELEASES TO AIR					Please enter all quantities in this section in KGs				
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
						0.0	0.0	0.0	0.0

3.2 Releases To Waters

4.2 RELEASES TO WATERS [Link to previous years emissions data](#) | PRTR#: W0277 | Facility Name : Huntstown Inert Waste Recovery Facility | Filename : W0277_2017.xls | Return Year : 2017 | 29/03/2018 10:12

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as this c

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button				

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button				

SECTION C : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button				

3.3 Releases To Wastewater Or Sewer

4.3 RELEASES TO WASTEWATER OR SEWER [Link to previous years emissions data](#) | PRTR#: W0277 | Facility Name : Huntstown Inert Waste Recovery Facility | Filename : W0277_201 | 29/03/2018 10:12

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button				

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button				

3.4 Releases To Land

4.4 RELEASES TO LAND [Link to previous years emissions data](#) | PRTR#: W0277 | Facility Name : Huntstown Inert Waste Recovery Facility | Filename : W0277_2017.xls | Return Year : 2017 | 29/03/2018 10:12

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND					Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY	
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button			

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO LAND					Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY	
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button			

3.5 Treatment And Transfer Of Waste

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE | PRTR#: W0277 | Facility Name : Huntstown Inert Waste Recovery Facility | Filename : W0277_2017.xls | Return Year : 2017 | 29/03/2018 10:12

Please enter all quantities on this sheet in Tonnes 3

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	M/C/E	Method Used	Location of Treatment	Haz Waste: Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste: Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
Within the Country	20 03 01	No	3.0	mixed municipal waste	D1	M	Weighed	Offsite in Ireland	Greyhound Recycling & Recovery,W0205-01	Crag Avenue,Clondalkin Industrial Estate,Dublin,.,,Ireland		
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking the Description of Waste then click the delete button								

4.0 Environmental Management System (EMS)

4.1 Introduction

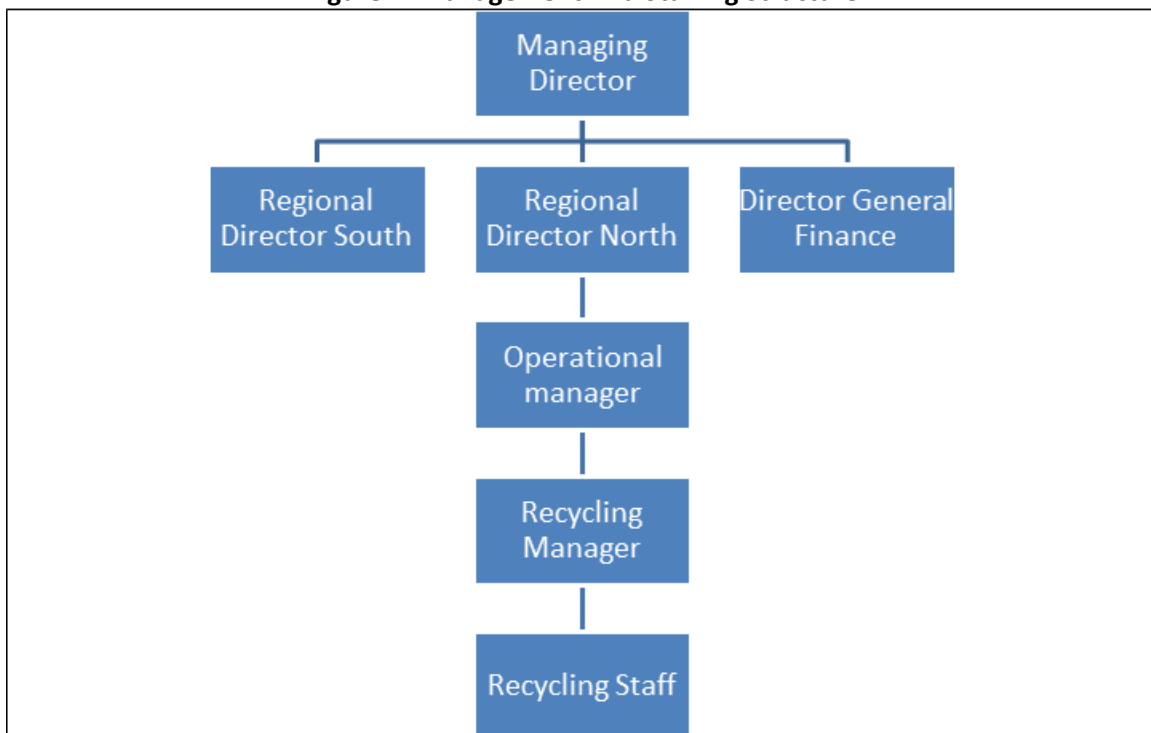
Roadstone implements a comprehensive Environmental Management System (EMS) at all of its facilities which predominantly comprise quarrying and construction material production activities. In recent years, the scope of the EMS has been expanded to include inert soil / C & D waste recovery activities. As part of its EMS, Roadstone has developed standard procedures to address waste acceptance and handling activities, as well as an emergency response plan. These are all available for at the facility.

4.2 Site Management Structure

Roadstone Ltd. currently employs 5 people at the facility on a full time basis. The organisation and management structure in the facility is provided in Figure 2. It shows a section of the overall organisation to highlight the management and reporting structure of the facility department. The staff at the facility include the following:

- Management staff;
- Technical staff; and
- Weighbridge staff.

Figure 2: Management And Staffing Structure



Individual staff and the accompanying roles are presented in Table 3.

Table 3: Facility Staff Roles

Staff	Role
Leonard Grogan	Facility Manager
John Fennell	Materials Intake Compliance Officer
Owen McGrath	Clay Technician
Brian Maguire	Weighbridge Operator
Kevin Slattery	Dispatch Clerk

4.3 Staff Awareness And Training

Staff training which was carried out in 2017 is summarised in Table 4.

Table 4: Summary Of Staff Training

Personnel	Date	Training Details	Comment
John Fennell	30/03/2017	Waste Management Training – Waste Legislation	Provided by Environmental Training Solutions Ltd.
Leonard Grogan	11/10/2017 to 12/10/2017	Haz-Mat Online – 1 day training course	Provided by One Touch Data Ltd.

4.4 Public Communications Programme

The public can, by appointment, call in to the weighbridge office to view information about the facility. Additional information is available on Roadstone’s website.

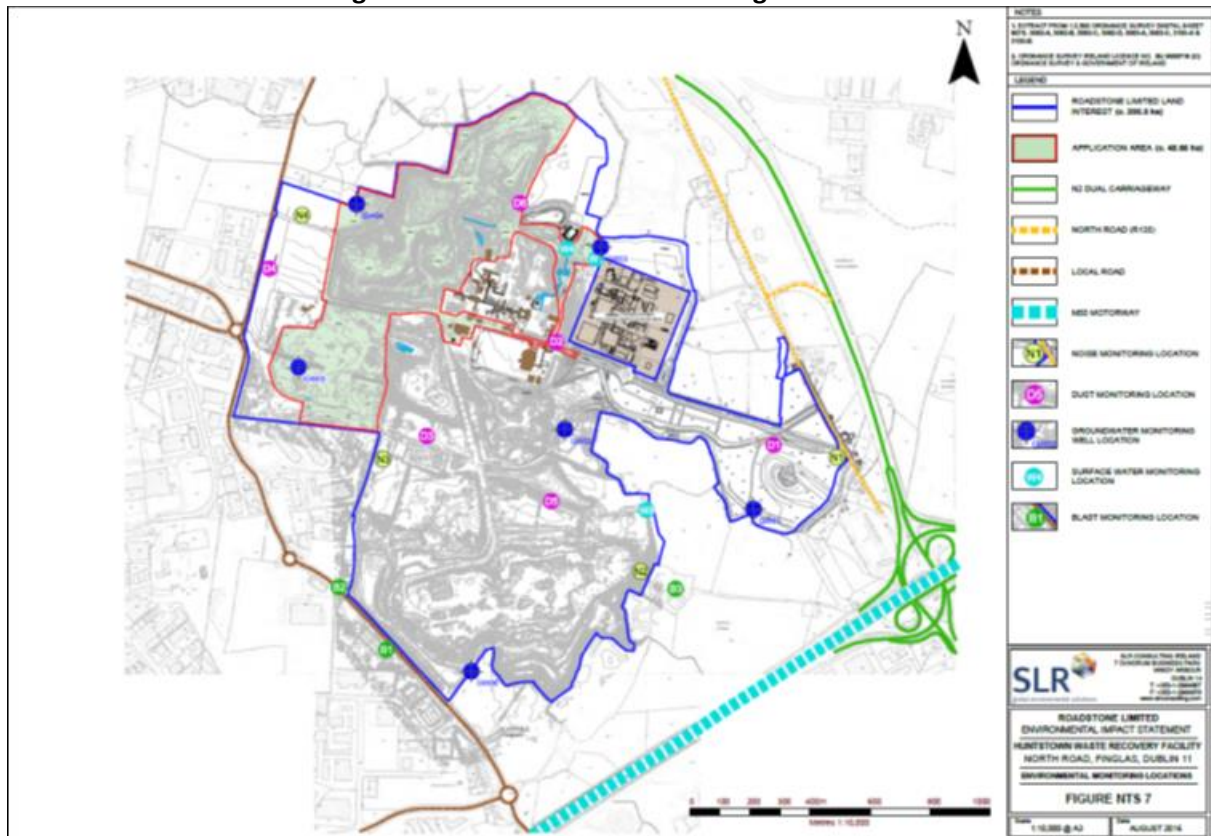
Records which are available for public inspection at the site office include:

- EPA issued Waste Licence W0277-02;
 - Monitoring Records;
 - Complaints Register;
 - Incidents Register; and
 - EPA correspondence file.
-

5.0 Emissions From The Facility

Environmental monitoring of surface water, groundwater, noise and dust is undertaken at designated locations across the facility. These are shown in Figure 3. An established programme of environmental monitoring associated with the ongoing rock extraction, aggregate processing and concrete / asphalt production activity is undertaken across the Huntstown Quarry Complex. The environmental monitoring requirements of the facility waste licence W0277-02 are undertaken in collaboration with the requirements set out in other site licences and permits. Only the environmental monitoring requirements detailed in the Waste Licence W0277-02, under which the recovery facility operates, are presented in this report.

Figure 3: Environmental Monitoring Locations



5.1 Noise Monitoring

5.1.1 Requirements

Noise monitoring is undertaken at the facility at a frequency as required by the Agency. Roadstone therefore undertake noise monitoring on a bi-annual basis. Noise data collection, analysis and subsequent reporting is carried out by BHP environmental consultancy who are based in Thomondgate, Co. Limerick. The dates when the two rounds of monitoring were undertaken are shown in Table 5. The full report containing the data, analysis and conclusions undertaken by BHP is appended to this report in Appendix A.

Table 5: Noise Monitoring Dates 2017

Monitoring Round	Daytime Measurements	Night-time Measurements
First	09/03/2017	25/03/2017
Second	18/12/2017	19/12/2017

5.1.2 Limits And Frequency

The noise emission limits are presented in the facility licence in *Schedule B.3 Noise Emissions*. These limits are presented in Table 6 below.

Table 6: Noise Emissions

Daytime dB _{Lar,T} (30 minutes)	Evening dB _{Lar,T} (30 minutes)	Night-time dB _{LAeq,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.

In order to ensure compliance with the noise emission limits monitoring is undertaken in accordance with the required survey duration and periods as shown in Schedule C.2 Noise Monitoring of the facility licence. These survey durations and periods are presented in Table 7 below.

Table 7: Noise Monitoring Frequency

Period	Minimum Survey Duration ^{Note 1}
Daytime (07:00hrs to 19:00hrs)	A minimum of 3 sampling periods at each noise monitoring location.
Evening-time (07:00hrs to 23:00hrs)	A minimum of 1 sampling period at each noise monitoring location.
Night-time ^{Note2} (23:00hrs to 07:00hrs)	A minimum of 2 sampling periods at each noise monitoring location.

Note 1: Sampling period T will be in accordance *Schedule B.3 Emission Limits* of the facility licence. This applies to day, evening and night time periods.

Note 2: Night-time measurements shall be made between 2300hrs and 0400hrs, Sunday to Thursday, with 2300 hrs being the preferred start time.

The survey programme was undertaken in accordance with the methodology specified in the 'Guidance note for noise: Licence applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' as published by the EPA, and also in adherence of the following standards:

- International Standard (ISO 1996-1: 2003E) Acoustics - Description, measurement and assessment of Environmental Noise. Part 1. Basic quantities and assessment procedures.
-

- International Standard (ISO 1996-2: 2007E) Acoustics - Description, measurement and assessment of Environmental Noise. Part 2. Determination of environmental noise levels.

British Standard: BS 7445 Part 3: 1991 (ISO 1996-3: 1987) Description and measurement of Environmental Noise. Part 3. Guide to application to noise limits.

5.1.3 Noise Monitoring Results

The results from the noise monitoring reports undertaken in 2017 can be summarised as follows:

- The noise contribution from site activity did not exceed the daytime limit of 55dBA at all locations;
- The noise contribution from site activity did not exceed the evening time limit of 50dBA at all locations;
- The noise contribution from site activity did not exceed the night time limit of 45dBA at the entrance; and
- There was no evidence of tonal or impulsive qualities to the recorded noise from the quarry at the nominated locations.

5.2 Dust Monitoring

5.2.1 Requirements

Roadstone have implemented a number of measures onsite for the control of dust. The operations onsite do not result in any fugitive dust emissions from the facility.

In order to minimise airborne dust nuisance during periods of dry weather water sprinklers are utilised. For those site roads and other areas used by vehicles which are not serviced by water sprinklers, a water bowser is used to ensure dust suppression. The road network in the vicinity of the facility is kept free from any debris caused by vehicles entering or leaving the facility. Any such debris or deposited materials is removed without delay.

5.2.2 Limits And Monitoring Frequency

Dust monitoring is undertaken in compliance with the facility licence on a bi-annual basis. Dust is monitored at the monitoring locations (as shown on Figure No. 8-1 titled 'Dust Monitoring Locations', dated August 2016 of the EIS).

Table 8: Dust Deposition Limits

Level (mg/m ² /day) ^{Note 1}
350

Note 1: 30 day composite sample with the results expressed as mg/m²/day.

The analysis method / technique used is the VDI 2119 (Bergerhoff method). Monitoring is undertaken by BHP laboratories. BHP are ISO 17025 INAB accredited.

5.2.3 Dust Monitoring Results

Dust monitoring at the facility was undertaken on 12th July 2017 and the 7th November 2017. The full test reports (July results – Test report no. 139599 and November results – Test Report No. 143645) are appended to this report in Appendix B. A summary of the results are presented in Table 9.

Table 9: Bi-Annual Dust Monitoring Results

Monitoring Point	July Results (mg/m ² /day)	November Results (mg/m ² /day)
D1	139	174
D2	245	114
D3	128	87
D4	134	349
D5	166	109
D6	N/A	232

The dust jar at D6 had been damaged for the July monitoring round. However, all of the other sampling locations were within the EPA limits of 350mg/m²/day for both sampling events.

5.3 Emissions To Water

5.3.1 Requirements

The facility water emission point reference number is W4. This is shown on drawing number. F3-1 titled 'Surface water monitoring locations' dated September 2016, of the EIS application. This is the last point at which water discharges from the facility after it has gone through the facility settlement ponds. The receiving waters are a tributary of the Ballystrahan stream.

5.3.2 Limits And Monitoring Frequency

The emission limit values are shown in Table 10.

Table 10: Surface Water Emission Limits

Parameter	Unit	Emission Limit Value
Temperature	°C	25 (max)
pH	pH units	6 – 9
BOD	mg/l	5.0
Suspended Solids	mg/l	15.0
Ammonia (as N)	mg/l	0.5
Orthophosphate (as P)	mg/l	0.5

The parameters which are analysed at W4 and the corresponding sampling frequency required for each parameter are shown in Table 11.

Table 11: W4 Monitoring Frequency And Parameters

Control Parameter	Monitoring Frequency	Analysis Method / Technique
Visual Inspection	Daily	Sample and examine for colour & odour
Flow	Daily	Flow meter
Temperature	Weekly	Temperature probe
pH	Weekly	pH electrode / meter
BOD	Weekly	Standard Method
Suspended Solids (mg/l)	Weekly	
Ammonia (as N)	Weekly	
Orthophosphate (as P)	Weekly	
Dissolved Metals ^{Note 1}	Quarterly	
Total Dissolved Solids	Quarterly	
Total Petroleum Hydrocarbons	Biannually	
Diesel Range Organics	Biannually	
Petrol Range Organics	Biannually	

Note 1: Cd, Cu, Fe, Pb, Mg, Mn, Ni and Zn.

5.3.3 Monitoring Results

The monitoring results for 2017 show that all water discharged from the facility was within the emission limit value for all parameters. The weekly discharge results are presented in Figure 4. During periods of dry weather no discharge from the facility takes place. Accordingly, no sample is taken during these periods as there is no discharge to sample.

Figure 4: W4 Discharge Weekly Chemical Analysis

Huntstown W4 Discharge Summary - Weekly Results							
MAC Values		0.5	5	6.0-9.0	0.5	15	25
Date	Lab ID	Ammoniacal Nitrogen (mg/L)	BOD (mg/L)	pH	Orthophosphate as P (mg/L)	Suspended Solids (mg/L)	Temperature °C
05/01/17	134409	<0.08	<2	8.1	<0.01	10	6.3
12/01/17	134596	<0.08	<2	8.2	<0.33	5	6
19/01/17	134731	<0.08	<2	8.0	<0.33	3	8
26/01/17	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
30/01/17	134910	<0.08	2	8.1	<0.33	10	7
09/02/17	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
16/02/17	135268	2	<5	8.1	<0.33	2	6
23/02/17	135439	1.1	<2	8.1	<0.33	3	8
27/02/17	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
09/03/17	135844	<0.08	<2	8.0	0.02	2	8
16/03/17	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
22/03/17	136085	0.41	<2	8.1	<0.01	5	7
30/03/17	136261	0.12	<2	8.0	<0.01	7	12
11/04/17	136596	0.09	<2	8.3	<0.01	8	12
20/04/17	136737	<0.08	<2	7.9	<0.01	1	11
24/04/17	136763	<0.08	<2	8.1	<0.01	4	12
04/05/17	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
11/05/17	137306	<0.08	<2	8.0	<0.33	6	11
18/05/2017	137457	<0.08	<2	7.7	<0.33	6	14
25/05/2017	137589	<0.08	<2	7.7	<0.33	4	15
01/06/2017	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
08/06/2017	137847	<0.08	<2	8.0	<0.33	6	14
15/06/2017	138067	<0.08	<2	7.8	<0.33	8	14
22/06/2017	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
29/06/2017	138363	<0.08	<2	7.9	<0.33	6	13
06/07/2017	138511	<0.08	3	7.6	<0.33	<1	16
13/07/2017	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
17/07/2017	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
27/07/2017	138977	<0.08	<2	7.3	<0.33	5	15
03/08/2017	139119	<0.08	<2	7.9	<0.33	1	16
10/08/2017	139493	<0.08	3	7.6	<0.33	2	14
17/08/2017	139671	<0.08	2	7.3	<0.33	<1	15
24/08/2017	139839	<0.08	<2	7.2	<0.33	3	15
30/08/2017	140036	<0.08	<2	7.5	<0.33	<1	13
07/09/2017	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
14/09/2017	140510	<0.08	<2	7.7	<0.33	3	11
21/09/2017	140737	<0.08	<2	7.7	<0.33	3	13
27/09/2017	140924	<0.08	<2	7.6	<0.33	4	13
05/10/2017	141284	<0.08	<2	7.7	<0.33	2	12
12/10/2017	141509	<0.08	<2	7.8	<0.33	4	11
19/10/2017	141670	<0.08	<2	8.1	<0.33	<1	12
25/10/2017	141846	0.11	3	7.7	<0.33	1	12
02/11/2017	142040	<0.08	<2	7.7	<0.33	<1	11
09/11/2017	142288	<0.08	2	8.1	<0.33	<1	10
16/11/2017	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
23/11/2017	142707	<0.08	<2	8.1	<0.33	4	8
28/11/2017	142827	<0.08	<2	8.1	<0.33	<1	7
07/12/2017	143135	0.14	<2	7.8	<0.33	6	9
13/12/2017	143255	<0.08	<2	7.9	<0.33	<1	7
21/12/2017	143439	<0.08	3	7.9	<0.33	1	10

Figure 5 shows the quarterly chemical analyses which are undertaken at W4. The results for 2017 show that all of the parameters tested were within guideline values for good environmental status for waterbodies.

Figure 5: W4 Discharge Quarterly Chemical Analysis

Huntstown W4 Discharge Summary - Quarterly Results												
Date	Lab ID	Copper	Dissolved Solids	Diesel Range Organics	PRO	TPH	Iron	Lead	Magnesium	Manganese	Nickel	Zinc
30/01/2017	134910	<0.05	521	<0.01	<0.001	<0.01	<0.20	<0.2	22	0.04	<0.1	0.02
24/04/2017	136763	<0.05	525	<0.01	<0.001	<0.01	<0.05	<0.2	21	0.03	<0.1	0.01
19/10/2017	141670	<0.05	535	<0.01	<0.001	<0.01	<0.05	<0.2	22	<0.03	<0.10	<0.01
25/10/2017	141846	<0.05	540	<0.01	<0.001	<0.01	<0.05	<0.2	22	0.04	<0.10	<0.010

5.4 Groundwater Monitoring

There are six groundwater monitoring points at the facility – GW01, GW02, GW03, GW04, GW05 and GW06. At the request of the Agency an additional groundwater monitoring point was installed in 2017. This is labelled as GW07. Groundwater sampling and analysis is undertaken by Tellabs.

Table 12: Groundwater Sampling Frequency

Parameter	Monitoring Frequency	Analysis Method / Techniques
Level	Quarterly	Standard Method
Visual Inspection		
pH		pH electrode / meter
Conductivity	Biannually	Standard Method
Ammonia (as N)		
Orthophosphate (as P)		
Nitrate		
Nitrite		
Total Dissolved Solids	Annually	Standard Method
Dissolved Metals ^{Note 1}		
Total Petroleum Hydrocarbons		
Diesel Range Organics		
Petrol Range Organics		
Total Coliforms		
Faecal Coliforms		

Note 1: Cd, Cu, Fe, Pb, Mg, Mn, Ni and Zn.

5.4.1 Groundwater Monitoring Results

Figure 6: GW01 Monitoring Results

Date	Ammoniacal Nitrogen as N (mg/L)	Cadmium (mg/L)	Conductivity (uS/cm @ 20°C)	Copper (mg/L)	Dissolved Solids	Diesel Range Organics	Iron	Lead	Magnesium	Nickel	Manganese	Nitrate (mg/L)	Nitrite (mg/L)	Orthophosphate as P (mg/L)	pH	PRO	Selenium	sulphate	TPH	Visual	Zinc (mg/L)	Faecal Coliforms (cfu/100ml)	Total Coliforms (cfu/100ml)
30/01/2017	<0.08		749		418	0.02						<0.5	<0.2	<0.33	7.4				0.057	Clear		Clear	
27/02/2017	<0.08		821		445	-						<0.50	<0.20	<0.33	7.2					slightly turbid, colourless		slightly turbid, colourless	1
22/03/2017	<0.08		1360		745							9	<0.10	<0.33	7.2					brown, turbid, lots of sand			9
24/04/2017	<0.08	<0.03	915	<0.05	441	<0.010	0.09	<0.2	21	<0.1	0.37	<0.1	<0.1	2.8	7.2	<0.001				Turbid	0.36	0	0
18/05/2017	<0.08		741		401							1	<0.20	<0.33	7.1					clear, colourless			3
15/06/2017	<0.08		740		397							0.59	<0.2	<0.33	7.1					slightly turbid with very few suspended solids			3
17/07/2017	<0.08		721		388	0.016						<0.5	<0.2	<0.33	7.6				0.032	clear, colourless		0	0
30/08/2017	<0.08		719		389							1	<0.20	<0.33	7.3				0.039	slightly turbid			>100
27/09/2017	<0.08		716		386							1	<0.20	<0.33	7.2			54	0.048	clear, colourless		1	9
25/10/2017	0.09		714		389	<0.010						<0.5	<0.20	<0.33	7.3			63	<0.010	slightly turbid		1	1
23/11/2017	<0.08		712		645							<0.50	<0.20	<0.33	7.4			63	<0.010	very slightly turbid, colourless			96
13/12/2017	<0.08		725		650							<0.5	<0.20	<0.33	7.2			63	<0.010	very slightly turbid			>100

Figure 7: GW02 Monitoring Results

Date	Lab ID	Ammoniacal Nitrogen	Cadmium	Conductivity (uS/cm @ 20°C)	Copper	Dissolved Solids	Diesel Range Organics	Iron	Lead	Magnesium	Nickel	Manganese	Nitrate	Nitrite	Orthophosphate as P	pH	PRO	Sulphate	TPH	Visual	Zinc	Faecal Coliforms (cfu/100ml)	Total Coliforms (cfu/100ml)
30/01/2017	134915	<0.08		1115		620	0.013						<0.5	<0.2	<0.33	7.2			0.037	Clear		0	0
27/02/2017	135484	<0.08		1422		780							<0.20	<0.33	7.2					Very slightly turbid, colourless		53	72
22/03/2017	136087	<0.08		891		484							3	<0.10	<0.01	7.2				clear, colourless			>100
24/04/2017	136759	<0.08	<0.03	1058	<0.05	513	<0.010	<0.05	<0.2	10		<0.03	<0.1	<0.1	<0.01	7.2	<0.0010			Slightly Turbid	0.01	0	19
18/05/2017	137459	<0.08		929		504							<0.50	<0.20	<0.33	7				turbid			6
15/06/2017	138069	<0.08		1294		707							0.74	<0.2	<0.33	7.1				turbid with sand and settles sediment			87
17/07/2017	138758	<0.08		1330		728	0.021						1	<0.2	<0.33	7.2			0.036	clear, colourless		0	60
30/08/2017	140043	<0.08		1578		865							1	<0.20	<0.33	7.1				nause			>100
27/09/2017	140919	<0.08		899		486							2	<0.20	<0.33	7.2			232	very slightly turbid, colourless		2	58
25/10/2017	141853	<0.08		1455		808	0.02						0.8	<0.20	<0.33	6.9			720	very turbid		5	>100
23/11/2017	142709	<0.08		817		741							2	<0.20	<0.33	7.1			237	very slightly turbid, colourless			>100
13/12/2017	143265	<0.08		456		1110							<0.5	<0.20	<0.33	7.1			2	clear, colourless			>100

Figure 8: GW03 Monitoring Results

Date	Lab ID	Ammoniacal Nitrogen	Cadmium	Conductivity (uS/cm @ 20°C)	Copper	Dissolved Solids	Diesel Range Organics	Iron	Lead	Magnesium	Nickel	Manganese	Nitrate	Nitrite	Orthophosphate as P	pH	PRO	sulphate	TPH	Visual	Zinc	Faecal Coliforms (cfu/100ml)	Total Coliforms (cfu/100ml)	
30/01/2017	134916	0.1		883		501	<0.010						1	<0.2	<0.33	7.3			0.02	Clear		0	0	
27/02/2017	135485	0.2		940		510							2	<0.20	<0.33	7.3				clear, colourless		0	0	
22/03/2017	136088	<0.08		923		500							4	<0.10	<0.01	7.2				<0.010	clear, colourless		0	0
24/04/2017	136760	<0.08	<0.03	1024	<0.05	500	<0.01	<0.05	<0.2	17		1.3	<0.1	1	<0.1	<0.01	7.2	<0.001		<0.01	Clear, colourless	<0.01	0	0
18/05/2017	137460	<0.08		918		499							2	<0.20	<0.33	7.1				<0.010	clear, colourless		0	0
15/06/2017	138070	<0.08		923		498							1.6	<0.2	<0.33	7.2				<0.010	clear, colourless		0	0
17/07/2017	138759	0.12		922		496	0.015						1	<0.2	<0.33	7.4				0.025	clear, colourless		0	0
30/08/2017	140043	0.31		925		499							1	<0.20	<0.33	7.2				0.039	clear, colourless		4	4
27/09/2017	140920	<0.08		923		501							1	<0.20	<0.33	7.1			164	0.072	clear, colourless		0	13
19/10/2017	141869	<0.08		927		499	<0.010						1	<0.20	<0.33	7.4			160	<0.010	turbid		9	0
25/10/2017	141854	0.43		911		501	<0.010						1.4	<0.20	<0.33	7.1			164	0.012			1	4
23/11/2017	142710	<0.08		871		797							0.51	<0.20	<0.33	7.2			134	<0.010	clear, colourless			13

Figure 9: GW04 Monitoring Results

Date	Lab ID	Ammoniacal Nitrogen	Cadmium	Conductivity (uS/cm @ 20°C)	Copper	Dissolved Solids	Diesel Range Organics	Iron	Lead	Magnesium	Nickel	Manganese	Nitrate	Nitrite	Orthophosphate as P	pH	PRO	Sulphate	Selenium	TPH	Visual	Zinc	Faecal Coliforms (cfu/100ml)	Total Coliforms (cfu/100ml)		
03/04/2017	134917	<0.08		775		442	<0.010						2	<0.2	<0.33	7.3			0.06	Clear			1	1		
27/02/2017	135486	<0.08		813		451							1	<0.20	<0.33	7.3				<0.010	clear, colourless			0	0	
22/03/2017	136089	<0.08		822		446							9	<0.10	<0.01	7.3				0.026	clear, colourless			1	1	
24/04/2017	136761	<0.08	<0.03	925.00	<0.05	446	<0.01	<0.05	<0.2	14	0.19	<0.1	1	<0.10	<0.01	7.2	<0.001			<0.01	Clear Colourless	<0.01	0	3		
18/05/2017	137461	<0.08		816		442							2	<0.20	<0.33	7.1	<0.010				clear, colourless with few suspended solids			9	9	
15/06/2017	138071	<0.08		819.000		442							1.6	<0.2	<0.33	7.1				<0.010	clear, colourless			8	8	
17/07/2017	138760	<0.08		820		442	0.015						2	<0.2	<0.33	7.4				0.029	clear, colourless		0	8	8	
30/09/2017	140044	<0.08		821		442							1	<0.20	<0.33	7.1				0.029	clear, colourless			>100	>100	
27/09/2017	140921	<0.08		823		445							1	<0.20	<0.33	7.2			101	0.037	clear, colourless		1	70	70	
19/10/2017	141871	<0.08		823		446	<0.010						2	<0.20	<0.33	7.5			101	<0.010	slightly turbid with few suspended solids			45	43	
25/10/2017	141855	0.11		806		441	<0.010						3	<0.20	<0.33	7.1			106	<0.010	very turbid		70	>100	>100	
23/11/2017	142711	<0.08		826		751							1	<0.20	<0.33	7.2			106	<0.010	clear, colourless				>100	>100

Figure 10: GW06 Monitoring Results

Date	Lab ID	Ammoniacal Nitrogen	Antimony	Cadmium	Conductivity (uS/cm @ 20°C)	Copper	Dissolved Solids	Diesel Range Organics	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Nitrite	Molybdenum	Orthophosphate as P	pH	PRO	Selenium	Sulphate	TPH	Visual	Zinc	Faecal Coliforms (cfu/100ml)	Total Coliforms (cfu/100ml)		
18/05/2017	137463	0.24			812		471							1	<0.20		<0.33	7.2					<0.010					
15/06/2017	138073	0.1			854		462							<0.5	<0.2		<0.33	7.2					<0.010					>100
17/07/2017	138762	0.1			800		432	0.031						1	<0.2		<0.33	7.4					0.050		1		30	
30/08/2017	140046	<0.08			781		420							<0.5	<0.20		<0.33	7.2					0.022				14	
27/09/2017	140923	<0.08			784		420							<0.05	<0.20		<0.33	7.1			116	0.054		1		11		
25/10/2017	141857	0.17			777		421	<0.010						0.9	<0.20		<0.33	7.2				152	<0.010		0		6	
23/11/2017	142713	<0.08			798		726							<0.20	0.79		<0.33	7.3				126	<0.010					
14/12/2017	143295	0.11	6.1		860		667							0.8	<0.2	1.9	<0.33	7.2		0.63	165	<0.010					33	
23/01/2017	144048	<0.08			838		455	<10						<0.5	<0.20		<0.33	7.3			149	<10					1	

Figure 11: GW07 Monitoring Result

Date	Lab ID	Ammoniacal Nitrogen	Antimony	Cadmium	Conductivity (uS/cm @ 20°C)	Copper	Dissolved Solids	Diesel Range Organics	Iron	Lead	Magnesium	Manganese	Nickel	Nitrate	Nitrite	Molybdenum	Orthophosphate as P	pH	PRO	Selenium	Sulphate	TPH	Visual	Zinc	Faecal Coliforms (cfu/100ml)	Total Coliforms (cfu/100ml)	
13/12/2017	143265	0.13			1101		1000							1	<0.20		<0.33	6.9		0.52	245	<0.010					82

6.0 Waste Management Record

The results of the chemical analyses undertaken on recovered soil and stone at the facility is presented in the table overleaf. The results show that all soil and stone accepted at the facility for recovery in 2017 was within the facility waste acceptance criteria (WAC) limits.

The total soil and stone intake for 2017 was 997,356 tonnes.

7.0 Breeding Bird Survey

7.1 Requirements

An annual breeding bird survey is carried out at the facility as specified in condition 6.14 of the facility licence:

'The licensee shall carry out an annual breeding bird survey, unless otherwise required by the Agency. The survey shall record the number of birds of conservation concern using the sit. The results of this assessment shall be reported as part of the Annual Environmental Report.'

The breeding bird survey was carried out on 25th May 2017 by SLR Consulting using the common bird census (CBC) method. The main aim of the breeding bird survey onsite comprised the following:

- To assess the number of active bird territories present in suitable habitats within the overall site margins and to map active nests where present;
- To evaluate the overall community of birds present on the overall site by recording all behavioural activity of non-territorial birds e.g. birds in flight; and
- To identify areas of the overall site that may merit special consideration should quarry activities or habitat change be planned during the breeding bird season.

7.2 Monitoring Results

The only suitable habitat for breeding birds onsite are the semi mature trees at the quarry margins.

A total of 20 species were recorded during the survey. These were either singing, foraging within the habitats on the survey areas, or flying over or passing through the site.

Of the 20 species recorded, 8 were Amber listed on the BoCCI:

- House martin;
- Lesser black backed gull;
- Linnet;
- Robin;
- Sand martin;
- Starling;
- Swallow; and
- Wheatear.

Of the 20 species recorded, 2 were Red listed on the BoCCI:

- Herring gull; and
- Meadow pipit.

However, only meadow pipit and robin are likely to be breeding in the vicinity of the waste recovery facility where suitable habitat is present around the peripheries of the site and / or where suitable habitat is available in restored areas.

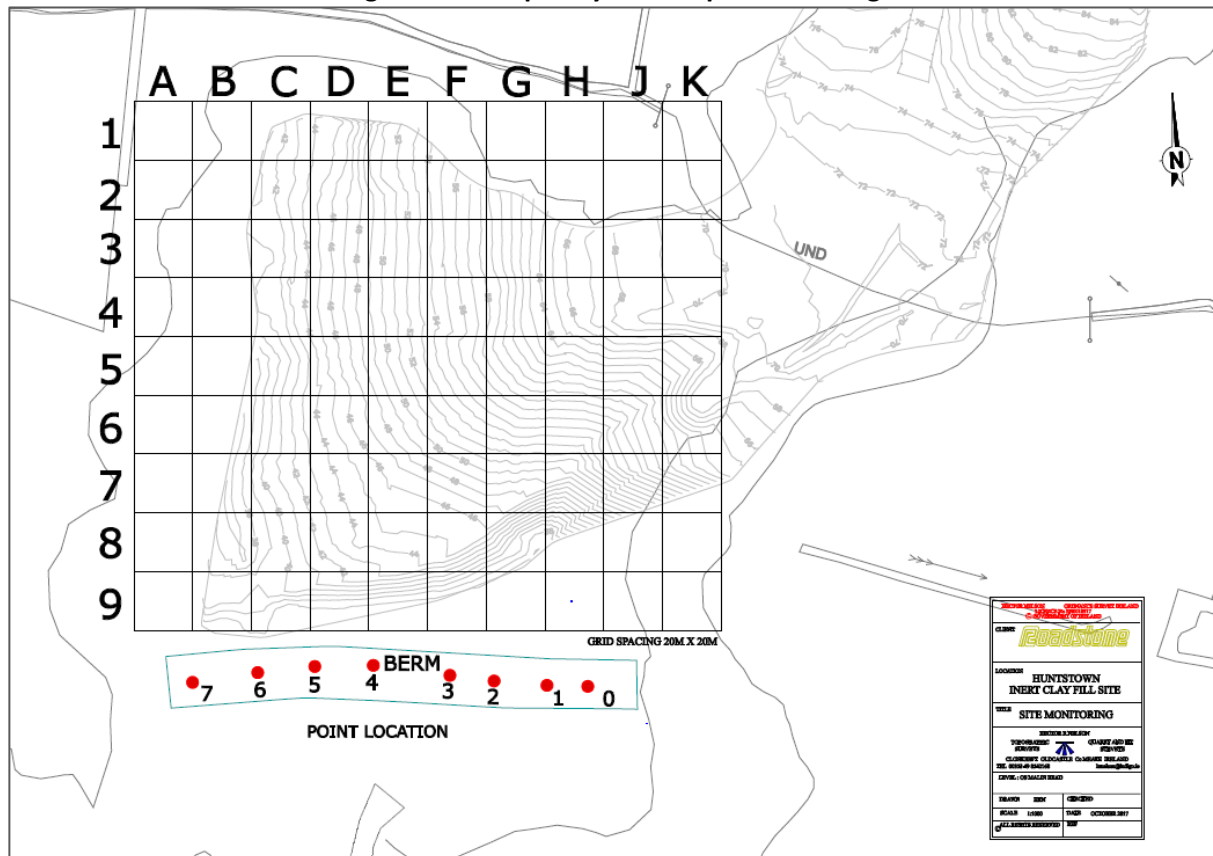
The full breeding bird survey is appended to this report in Appendix C.

8.0 Topographical Monitoring & Stability Assessment

8.1 Stability Assessment

A stability assessment was initiated on the temporary side slope (berm) at the facility in June 2017. This assessment comprised the weekly monitoring of the berm for any movement using GIS monitoring equipment. Monitoring was undertaken at seven designated monitoring points along the bund over a 6 week period. Easting, northing and elevation was recorded at each monitoring point with an accuracy of 0.1mm. The location of the berm and monitoring points are shown in Figure 12.

Figure 12: Temporary Side Slope Monitoring



The results of the monitoring are presented in Appendix D. The monitoring shows that there was no change in the location of each monitoring point on the berm throughout the monitoring period. Therefore no movement in the berm occurred during 2017.

8.2 Topographical Monitoring

The annual topographical survey was carried out using drone survey equipment. The survey includes a measurement of the total void space that has been filled and the remaining available void space. This survey has been carried out in accordance with the written instructions issued by the Agency. The output of the survey is shown in Figure 13 below.

Figure 13: Topographical Monitoring Of Void Space



For the purposes of calculation of void space in the north quarry the survey has separated into two areas. Those areas which have:

- Been partially filled to date (beige shaded area on Figure 13); and
- Not been filled at all (blue shaded area on Figure 13, and also includes the Western Quarry Capacity).

Table 13: Void Space Remaining

Area	Tonnes Imported	Tonnes Remaining	Remaining Capacity (tonnes)
Partially Filled (beige)	2,500,000	0	0
Not Yet Filled (blue)	0	6,000,000	6,000,000

9.0 Tank And Pipeline Testing And Inspection

The tank and pipeline testing and inspection report was completed by Environmental Efficiency consultancy on 18th May 2016. Environmental Efficiency have the following ISO accreditations:

- ISO 9001; and
- ISO14001.

During the field visit by Environmental Efficiency, nine individual inspections were undertaken on bunds located onsite and within the W0277-02 licenced area. Each bund was assessed for its compliance against the following requirements:

- Adequacy of size;
- Of suitable construction;
- Protection from rain; and
- Interceptor at refuelling area.

The results of the tank and pipeline testing are presented in the report Document Number: 1690-01 v2.00. This is attached as Appendix E.

10.0 Facility Operations Summary

10.1 Development / Infrastructural Works Summary

Roadstone continue to implement infrastructural works and improvements at the facility. A summary of the works which have been completed in 2017 are shown in Table 14 below.

Table 14: Infrastructural Works At The Facility

Infrastructural Work	Completion Date	Improvement
Wheel Cleaner Upgrade	November 2017	New settlement tanks and wheel cleaner machine to wash all vehicles leaving facility
Communications System	March 2017	Purchase of new Hytera portable radios
Facility Transport	December 2018	Purchase of additional facility 4x4 vehicles

The infrastructural works proposed for 2018 comprise the following:

- Installation of new sprinkler system for dust suppression – expected start May 2018;
- Upgrade of facility CCTV system – expected start June 2018;
- Upgrade of communications system, additional radios – expected start March 2018; and
- Installation of additional facility road signage – expected start July 2018.

10.2 Reported Incidents Summary

There have been two reported incidents during 2017, both of which were category minor, and one of which has been closed. Both incidents involved material which had been deemed unsuitable for recovery and which were subsequently moved to the waste quarantine area pending removal offsite to an authorised licenced facility. A summary of the details of the incidents are shown in Table 15.

Table 15: Incidents Summary

Incident Number	Category	Incident Date	Status
INCI013449	Trigger Level Reached	26/10/2017	Open
INCI012437	Other	13/06/2017	Closed

10.3 Complaints Summary

No complaints were made as a result of the operation of the facility during 2017.

10.4 Produced Waste Management Record

Waste management at the facility is undertaken by Thorntons recycling (Roadstone customer reference number: 17088). Thorntons recycling have the following accreditations:

- ISO9001;
- EN15713;
- ISO14001; and
- OHSAS 18001.

The monthly waste management data for 2017 for the facility is summarised in Table 16.

Table 16: Waste Management Summary

Date	Waste Type	Nett Weight (kgs)
January	Bulky Mixed Municipal Waste	1.000
February	Bulky Mixed Municipal Waste	0.500
May	Mixed Municipal Waste	0.135
June	Mixed Municipal Waste	0.220
July	Mixed Municipal Waste	0.160
August	Mixed Municipal Waste	0.130
September	Mixed Municipal Waste	0.205
October	Mixed Municipal Waste	0.145
November	Mixed Municipal Waste	0.213
December	Mixed Municipal Waste	0.250

10.5 Resource Consumption Summary

Diesel usage is monitored onsite on a daily basis. Both diesel consumption and the corresponding hours worked are recorded for each machine. A summary of the monthly data is presented in Table 17.

Table 17: Resource Consumption Summary (Litres Diesel)

Machine	January	February	March	April	May ¹	June ¹	July	August ¹	September	October ¹	November	December	Total For year
A40 Dumper	101	0	0	0	0	0	0	0	0	0	0	0	101
Case 350 Digger	0	0	0	0	0	0	0	0	0	342	0	0	342
Cat 330	977	0	0	0	0	0	0	0	0	0	0	0	977
Digger Hire 145	0	0	0	0	0	0	0	0	0	0	0	0	0
Doosan 380	0	0	0	0	0	0	2926	0	0	0	0	0	2926
Hyundi 145	439	724	708	370	0	0	432	0	137	0	393	447	3650
JCB Roller	0	0	0	0	0	0	0	0	0	0	209	217	426
Jeep (Red)	0	80	50	65	0	0	0	0	62	0	0	0	257
Jeep-LG (Gold)	0	0	0	0	0	0	0	0	0	0	0	0	0
Komatsu 65 (Adr)	0	0	1837	813	0	0	406	0	0	0	0	565	3621
Komatsu 65 (Rd)	1617	0	2247	3361	0	0	253	0	0	0	0	205	7683
Komatsu 85 (A)	5087	5089	5243	0	0	604	4149	0	0	0	2118	3256	25546
Komatsu 85 (B)	661	4390	5606	2613	0	262	4282	228	3988	0	3384	3092	28506
Komatsu 35 tonne	0	0	0	0	0	0	0	0	0	0	0	0	0
Komatsu HM400	0	0	0	0	0	0	0	0	0	0	0	0	0
Low Loader	0	203	0	0	0	0	0	0	0	0	0	94	297
Mick Moylan Case	250	0	0	337	0	0	218	0	0	0	206	204	1215
Volvo A25 (Roadstone)	252	0	634	162	0	0	0	0	0	0	0	0	1048
Monthly Total (litres)	9384	10486	16325	7721	N/A	866	12666	228	4187	342	6310	8080	76595

Note 1: Figures for this month are inaccurate as some of the data sheets were illegible due to water damage from rainfall.

11.0 Energy Efficiency Audit Report

An energy audit for the facility was carried out on 1st March 2017. This was the first energy audit undertaken at the facility and was accompanied by an energy meeting. Action points raised during the audit were discussed during the meeting. A summary of these action points are as follows:

- Develop site specific folder and location drawings;
- Develop KPI data and baselines; and
- Investigate the possibility of EFT integration.

In order to increase energy efficiency at the facility, the audit identified nine items which are required to be addressed within specific timeframes. These have all been completed within the allocated timeframes.

Table 18: Energy Efficiency Audit Actions

Item	Description	Responsibility	Time Frame
Item 1	Develop Energy Management Folder – Ref Appendix 1 of the energy audit report (contained in Appendix F) .	Leonard Grogan & John Fennell	March 2017
Item 2	Complete Location Drawing	Leonard Grogan & John Fennell	May 2017 Ongoing
Item 3	Investigate Possibility of integration into EFT System	Leonard Grogan & John Fennell	May 2017
Item 4	Create PC Based Spreadsheet to include pumping data and associated generator fuel data.	Leonard Grogan & John Fennell	June 2017
Item 5	Develop Location Drawings to include Lighting and Heating Loads associated with administration buildings.	Leonard Grogan & John Fennell	October 2017
Item 6	Investigate Bowser to establish if an energy baseline can be developed.	Leonard Grogan & John Fennell	June 2017
Item 7	Develop Location Drawings to include how water moves around the location.	Leonard Grogan & John Fennell	December 2017
Item 8	Transpose data associated with mobile plant into an excel format.	Leonard Grogan & John Fennell	April 2017
Item 9	Use KPI data to develop internal awareness campaigns and training.	Leonard Grogan & John Fennell	May 2017

Training and awareness requirements which have been highlighted as a result of the energy audit are shown in Table 19.

Table 19: Energy Audit Training & Awareness

Employee Name	Awareness Training	Training Needs
Leonard Grogan	Leonard was involved in development of Energy Management Systems for Roadstone and as such is extremely familiar with energy management.	Ongoing
John Fennell	John was present for the audit and site meetings and will continue to develop as Items 1-9 are addressed.	Ongoing
Brian Maguire	Brian is responsible for retaining the fuel data and was present for discussions on possible developments in this area.	Ongoing
General Employees	Update – Completed following internal audit and development of KPI Data	Date to be set to coincide with next site energy meeting

Mapping and process drawings will be used to develop an understanding of the processes onsite. The monitoring and metering plan will be developed within the drawings and reviewed on an ongoing basis and will be a means to explore developments that can be made in this area. These drawings will also facilitate meaningful internal audits. Location Specific KPI Reports are used at the location and are a means of highlighting ongoing monthly performance and benchmarking. EFT has been successful in securing the contract for developing the Monitoring and Metering Infrastructure which may be developed so that graphical representations of the process and automated cost reports can be produced. The full energy audit report is contained in Appendix F.

12.0 Closure, Restoration & Aftercare Management Plan

The updated facility closure, restoration and aftercare management plan (CRAMP) was completed by SLR and is appended to this report in Appendix G. This CRAMP is reviewed annually and updated where necessary to take account of any facility or process changes, technology changes and costing changes (inflation).

The CRAMP was prepared in accordance with the EPA publication '*Guidance on Assessing and Costing Environmental Liabilities (2014)*'. The plan envisages that the licensed facility will achieve a clean closure, such that on cessation of waste recovery operations, plant and equipment are decommissioned, decontaminated and / or removed from the facility in order to ensure that the facility presents no environmental liabilities or risk of long-term environmental pollution.

The facility CRAMP has identified that the total combined cost of the facility closure, restoration and aftercare management will be €1,534,502 (including 15% contingency) of which €913,387 is for closure and €621,115 is for aftercare.

Roadstone Ltd. is prepared to make the required financial provision in respect of closure and aftercare costs by means of a financial bond submitted under separate cover to the Agency.

13.0 Environmental Liabilities Risk Assessment

An environmental liabilities risk assessment (ELRA) was undertaken by SLR consulting in August 2015. The ELRA was prepared in accordance with the EPA publication *'Guidance on Assessing and Costing Environmental Liabilities (2014)'*.

The environmental liability was assessed based on the worst case scenario of a major fuel leak from the existing 53,000 litre fuel storage tank. In this event, the maximum environmental liability which could be incurred is estimated to be of the order of €1,584,300 (inclusive of 20% contingency).

Roadstone Ltd. has the following insurance cover in place by way of provisioning for potential environmental liabilities in respect of the planned waste recovery facility at Huntstown:

- Employers liability insurance – indemnified for up to €22.7 million; and
- Public liability insurance – indemnified for up to €13 million.

As detailed in the ELRA report:

'Roadstone will make the financial provision necessary to cover the amount of the assessed environmental liability by lodging an insurance company bond with the Agency, coupled with an agreement which will empower it to apply such security (or part thereof as may be required) in the event that a liability event materialises at the waste recovery facility at Huntstown.'

Details of Roadstone's current employers liability insurance and public liability insurance are provided in the full ELRA Report which is appended to this AER in Appendix H.

14.0 Close

During the reporting year 2017, the recovery facility has been managed, operated and controlled in accordance with all of the licence conditions in the facility licence W0277-02. Roadstone consider that as a result of facility compliance, the facility has not caused environmental pollution or breached any environmental quality or emission standard. The facility continues to operate in an environmentally progressive manner.

APPENDIX A

Noise Monitoring Reports

TEST REPORT 135089



Client:

**Roadstone Wood Ltd
Fortunestown
Tallaght
Dublin 24**

BHP Ref No.: 17/03/0701

Order No.:

Date Received: 9th & 25th March 2017

Date Tested: 9th & 25th March 2017

Test Specification: Noise Monitoring

BHP

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E Mail
dervlapurcell@bhp.ie

FAO: Cormac McCarthy

Item: Noise survey at Noise Sensitive Locations at the Roadstone operation located at Huntstown, Finglas, Co. Dublin.

For and on behalf of BHP Ltd.

A handwritten signature in black ink, appearing to read 'Dervla Purcell'.

Dervla Purcell

Date Issued: 29th March 2017

Supplement to report No. N/A

Test results relate only to this item. This test report shall not be duplicated except in full and with the permission of the test laboratory

Contents

- 1.0 Scope
- 2.0 Survey Approach
- 3.0 Date of survey
- 4.0 Results
 - 4.1 Noise levels
- 5.0 Interpretation of results
 - 5.1 Noise Levels
- 6.0 Conclusions

Appendix A: Map showing noise monitoring locations

Appendix B: Photographs indicating noise monitoring locations

1.0 Scope of survey

At the request of Roadstone Wood Ltd., BHP undertook noise monitoring at their operation in Huntstown, Finglas, Co. Dublin. The purpose of this survey was to provide Roadstone with the noise data and analysis required as part of their planning requirements.

This report deals with four nominated noise locations at the operation in Huntstown, Finglas, Co. Dublin.

2.0 Survey approach

Two sound level meters (SLM's) were used in the survey, a Cirrus 171C type 1 (serial number G068852) and a Cirrus 831C type 1 (serial number D20874FF). The SLM's were calibrated at the start of the survey with a CRL 515 calibrator (serial number 74767). The same calibrator was used to check the SLM at the end of the survey, to inspect the microphone drift.

Monitoring and the interpretation of acquired data are to the following standards:

- International Standard (ISO 1996-1: 2003E) Acoustics – Description, measurement and assessment of Environmental Noise. Part 1. Basic quantities and assessment procedures.
- International Standard (ISO 1996-2: 2007E) Acoustics – Description, measurement and assessment of Environmental Noise. Part 2. Determination of environmental noise levels.
- British Standard: BS 7445 Part 3: 1991 (ISO 1996-3: 1987) Description and measurement of Environmental Noise. Part 3. Guide to application to noise limits.

60-minute daytime levels were measured at four locations and 15minutes at the quarry entrance for night time levels. The locations are identified on the map included in Appendix A.

Appendix B contains photographs of the noise monitoring equipment at the monitoring points.

3.0 Date of survey

The daytime monitoring survey was carried out on the 9th March 2017 by Aidan Daffy and the night time survey was carried out on the 25th March 2017 by Dervla Purcell

4.0 Results

4.1 Noise levels:

Levels are presented on the following pages.

Day-time Measurements - Noise Locations – Huntstown, Finglas, Co. Dublin. (9th March 2017)

Location	Sampling Interval	Duration (mins)	L_{AEQ} dB	L_{A10} dB	L_{A90} dB	Wind speed m/s	Sampling notes
N1	14:08-15:08Hrs	60	55	58	46	0-1 W	Airplanes are taking off at up to 72dBA. Passing traffic audible at up to 58dBA from nearby public roads. No quarry noise was audible. Trucks entering and leaving the quarry were audible in the range of 50-55dBA.
N2	12:40-13:40Hrs	60	63	65	60	0-1 W	The crusher operations were constant throughout the noise monitoring period at 59-66dBA. Frequent aircrafts passing overhead were audible at up to 72dBA. The crusher is the main noise source at this location.
N3	13:30-14:30Hrs	60	55	58	45	0-1 SW	The quarry is not audible. Noise from the adjacent industrial facility is audible at 45-50dBA and up to 53dBA at times. Overhead aircrafts are audible at up to 75dBA.
N4	12:18-13:18Hrs	60	58	61	45	0-1 W	Some activity was audible from the quarry at 45-50dBA. Frequent aircrafts overhead are audible at up to 70dBA. Aircraft activity is the main noise source.

Night-time Measurements - Noise Locations – Huntstown, Finglas, Co. Dublin. (25th March 2017)

Location	Sampling Interval	Duration (mins)	L_{AEQ} dB	L_{A10} dB	L_{A90} dB	Wind speed m/s	Sampling notes
Entrance	21.35-21.50Hrs	15	59	61	56	0	The quarry is not operational or audible. The N2 and M50 road traffic is constant at 55-58dBA. Aircraft noise was audible at up to 70dBA frequently.

5.0 Interpretation of results

5.1 Noise levels;

The noise limits for the Roadstone operation in Huntstown Quarry, Finglas, Co. Dublin are as follows:

Daytime Limit L_{Aeq} 55dBA

Night time Limit L_{Aeq} 45dBA

5.1.1 Day-time levels :

As can be seen in section 4.1, L_{Aeq} levels at the noise monitoring locations are on or above the limit at all the locations.

From on-site observations it can be seen that the main noise sources for the noise levels at N1, N3 and N4 are the M50 or planes from Dublin airport. These are not considered exceedances of the limits by the quarry operations.

N2 was impacted by airplanes but the main noise source was the crusher and screener working in the quarry pit. This is considered an exceedance of the site limits by the quarry.

5.1.2 Night-time levels:

As can be seen in section 4.1, L_{Aeq} levels at the entrance are over the limit. The exceedance of the noise limit at this location is due to noise sources not related to the quarry. This is not considered an exceedance of the limit by the quarry.

6.0 Conclusions

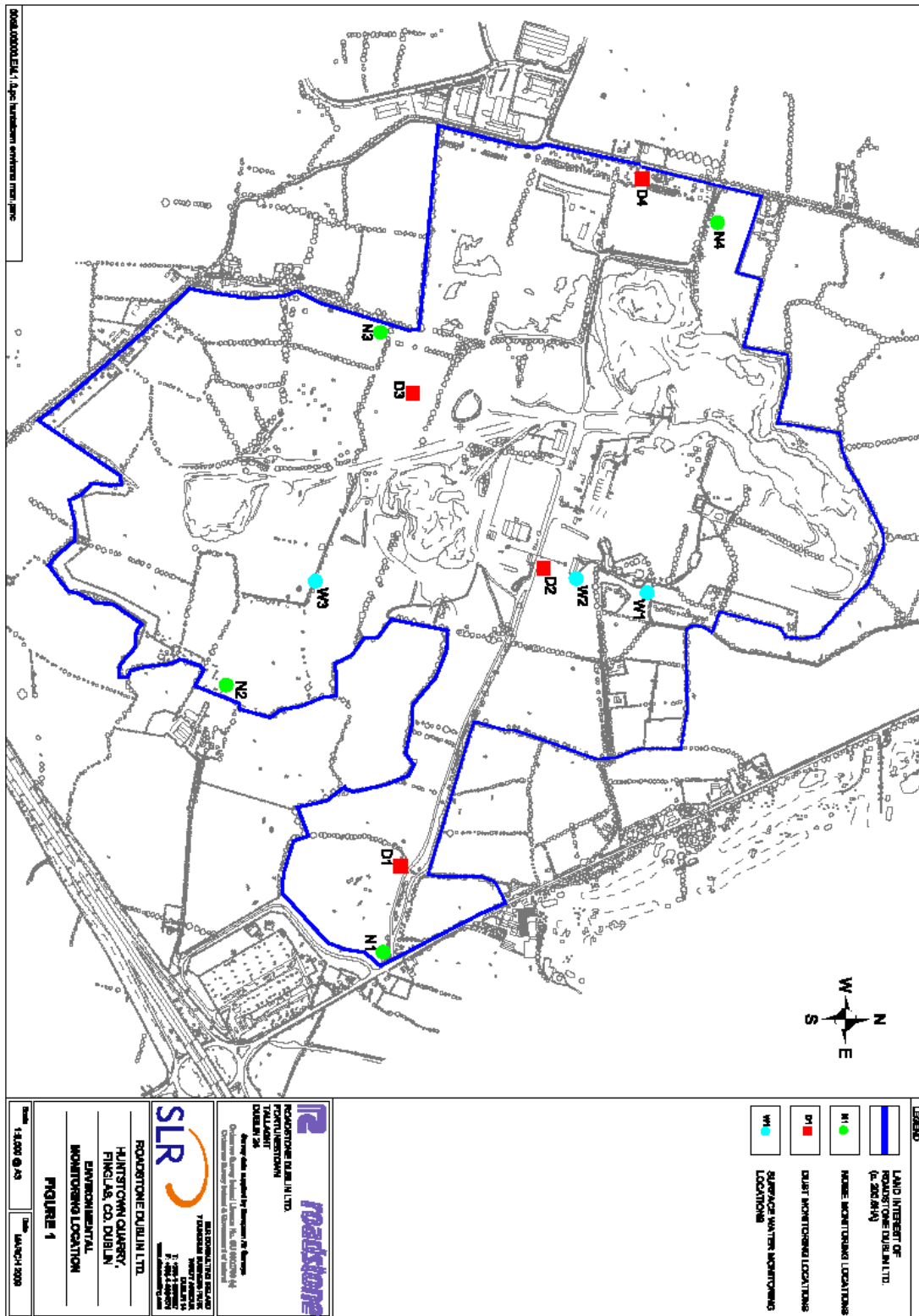
The noise contribution from quarrying activity did not exceed the daytime limit of 55dB at all locations except N2. The crusher operations led to the noise failure at this location.

The noise contribution from quarrying activity did not exceed the night time limit of 45dB at the entrance.

There was no evidence of tonal or impulsive qualities to the recorded noise from the quarry at the nominated locations.

Appendix A

Site map showing noise monitoring locations
 Huntstown, Finglas, Co.Dublin.

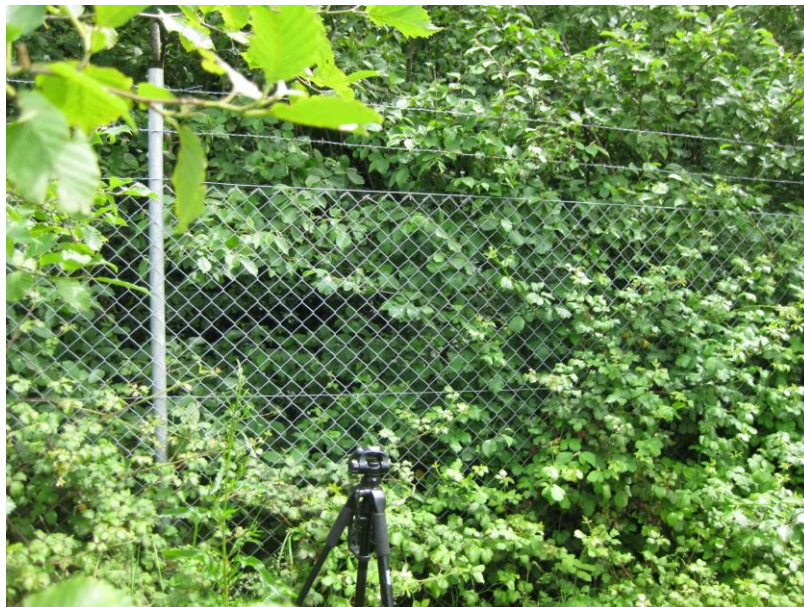


Appendix B

Photographs of Noise Monitoring equipment on-site during monitoring



Noise monitoring equipment at Monitoring Location N1



Noise monitoring equipment at Monitoring Location N2



Noise monitoring equipment at Monitoring Location N3



Noise monitoring equipment at Monitoring Location N4

BHP/CEM/23/A

Analysing
Testing
Consulting
Calibrating

TEST REPORT 145109



Client:

**Roadstone Wood Ltd
Fortunestown
Tallaght
Dublin 24**

**BHP Ref No.: 17/12/1661
Order No.:
Date Received: 18th December 2017
Date Tested: 18th December 2017
Test Specification: Noise Monitoring**

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Item: Noise survey at Noise Sensitive Locations at the Roadstone operation located at Huntstown, Finglas, Co. Dublin.

For and on behalf of BHP Ltd.

A handwritten signature in black ink, appearing to read 'Dervla Purcell'.

**Dervla Purcell
Date Issued: 4th January 2018
Supplement to report No. N/A**

Test results relate only to this item. This test report shall not be duplicated except in full and with the permission of the test laboratory

Contents

- 1.0 Scope
- 2.0 Survey Approach
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- 6.0 Conclusions

Appendix A: Map showing noise monitoring locations

Appendix B: Photographs indicating noise monitoring locations

1.0 Scope of survey

At the request of Roadstone Wood Ltd., BHP undertook noise monitoring at their operation in Huntstown, Finglas, Co. Dublin. The purpose of this survey was to provide Roadstone with the noise data and analysis required as part of their planning requirements.

This report deals with four nominated noise locations at the operation in Huntstown, Finglas, Co. Dublin.

2.0 Survey approach

Two sound level meters (SLM's) were used in the survey, a Cirrus 171C type 1 (serial number G068852) and a Cirrus 831C type 1 (serial number D20874FF). The SLM's were calibrated at the start of the survey with a CRL 515 calibrator (serial number 74767). The same calibrator was used to check the SLM at the end of the survey, to inspect the microphone drift.

Monitoring and the interpretation of acquired data are to the following standards:

- International Standard (ISO 1996-1: 2003E) Acoustics – Description, measurement and assessment of Environmental Noise. Part 1. Basic quantities and assessment procedures.
- International Standard (ISO 1996-2: 2007E) Acoustics – Description, measurement and assessment of Environmental Noise. Part 2. Determination of environmental noise levels.
- British Standard: BS 7445 Part 3: 1991 (ISO 1996-3: 1987) Description and measurement of Environmental Noise. Part 3. Guide to application to noise limits.

Three 30-minute daytime levels, one 30-minute evening time level and two 15-minute night time levels were measured at four locations. The locations are identified on the map included in Appendix A.

Appendix B contains photographs of the noise monitoring equipment at the monitoring points.

3.0 Date of survey

The monitoring survey was carried out on the 18th – 19th December by Tara Foley.

4.0 Results

4.1 Noise levels:

Levels are presented on the following pages.

Day-time Measurements - Noise Locations – (18th December 2017)

Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL1	12.24-12.54Hrs	30	59	61	54	0-1 W	Road traffic was audible at 51-55dBA frequently. Trucks leaving the site were audible at up to 56dBA. Frequent planes passing overhead were audible at up to 70dBA.
	12.54-13.24Hrs	30	57	60	54		
	13.24-13.54Hrs	30	57	58	53		
Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL2	12.56-13.26Hrs	30	56	58	52	0-1 W	Planes passing overhead were frequent and audible at up to 62dBA. Constant traffic noise was audible at 51-54dBA. Birdsong reached levels of about 60dBA. Some sounds were audible from the quarry at 50-52dBA and up to 53dBA with reversing sirens.
	13.26-13.56Hrs	30	53	54	51		
	13.56-14.26Hrs	30	56	59	52		
Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL3	12.39-13.09Hrs	30	59	64	50	0-1 W	Planes passing overhead were frequent and audible at up to 70dBA. Road traffic is audible at 49-52 and almost constant. Quarry activity was audible at 48-52dBA at times. There was less planes passing overhead during the third monitoring period leading to a lower L _{Aeq} level.
	13.09-13.39Hrs	30	58	62	49		
	13.39-14.09Hrs	30	52	53	47		
Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL4	12.47-13.17Hrs	30	62	67	51	0-1 W	Constant road traffic was audible at 50-55dBA. Birdsong was frequent and reached levels of 51-54dBA. Aircrafts passing overhead could be heard at up to 75dBA. Quarry activity was barely audible above background levels at about 50-52dBA.
	13.17-13.47Hrs	30	60	62	50		
	13.47-14.17Hrs	30	57	55	50		

Evening-time Measurements - Noise Locations – (18th December 2017)

Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL1	22.02-22.32Hrs	30	56	56	52	0	Alarm off site was sounding and audible at 52-54dBA. M50 traffic noise was constant at 45-55dBA. Aircrafts passing overhead were audible at up to 70dBA. No quarry activity was audible.
Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL2	22.09-22.39Hrs	30	52	52	48	0	Traffic noise was constant at 45-47dBA. Aircrafts passing overhead were audible at up to 70dBA. No quarry activity was audible.
Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL3	22.14-22.44Hrs	30	51	51	46	0	Traffic noise was constant at 44-47dBA. Aircrafts passing overhead were audible at up to 70dBA. No quarry activity was audible.
Location	Sampling Interval	Duration (mins)	L _{AEQ} dB	L _{A10} dB	L _{A90} dB	Wind speed m/s	Sampling notes
NSL4	22.20-22.50Hrs	30	55	52	48	0	Traffic noise was constant at 45-50dBA. Aircrafts passing overhead were audible at up to 70dBA. No quarry activity was audible.

Night-time Measurements - Noise Locations – (18-19th December 2017)

Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL1	23.08-23.23Hrs	15	54	52	51	0-1 W	Road noise audible at 50-55dBA. Aircrafts passing overhead audible at up to 70dBA.
	23.23-23.38Hrs	15	53	52	51		
Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL2	23.02-23.17Hrs	15	49	51	47	0-1 W	Road noise audible at 45-47dBA. Some wind noise was audible at 40-43dBA.
	23.17-23.32Hrs	15	51	52	47		
Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL3	23.04-23.19Hrs	15	48	49	46	0-1 W	Road noise audible at 44-47dBA. Some wind noise was audible at 40-43dBA.
	23.19-23.34Hrs	15	50	50	46		
Location	Sampling Interval	Duration (mins)	L _{AEQ} dBA	L _{A10} dBA	L _{A90} dBA	Wind speed m/s	Sampling notes
NSL4	23.00-23.15Hrs	15	50	50	46	0-1 W	Road noise audible at 45-50dBA. Dog barking was audible at 50dBA frequently.
	23.15-23.30Hrs	15	53	50	46		

5.0 Interpretation of results

5.1 Noise levels;

The daytime noise limits for the Roadstone operation in Huntstown, Co Dublin are as follows:

Daytime Limit	L_{Aeq} 55dBA
Evening time Limit	L_{Aeq} 50dBA
Night time Limit	L_{Aeq} 45dBA

5.1.1 Day-time levels:

As can be seen in section 4.1, L_{Aeq} levels at the noise monitoring locations are above the daytime limit at all the locations except for monitoring period 2 at N2 and monitoring period 3 at N3.

From on-site observations it can be seen that the main noise sources for the noise levels at all locations is the M50 traffic noise or planes from Dublin airport. These are not considered exceedances of the limits by the quarry operations.

5.1.2 Evening-time levels:

As can be seen in section 4.1, L_{Aeq} levels at all four locations are varying above and below the evening limit of 50dBA. The exceedance of the noise limit at these locations is due to noise sources not related to the quarry – aircrafts being noted as the main noise source at all four locations. There was no noise audible from the quarry itself. This is not considered an exceedance of the limit by the quarry.

5.1.3 Night-time levels:

As can be seen in section 4.1, L_{Aeq} levels at all four locations are above the night limit of 45dBA. The exceedance of the noise limit at these locations is due to noise sources not related to the quarry. There was no noise audible from the quarry itself. This is not considered an exceedance of the limit by the quarry.

6.0 Conclusions

The noise contribution from quarrying activity did not exceed the daytime limit of 55dBA at all locations.

The noise contribution from quarrying activity did not exceed the evening time limit of 50dBA at all locations.

The noise contribution from quarrying activity did not exceed the night time limit of 45dBA at the entrance.

There was no evidence of tonal or impulsive qualities to the recorded noise from the quarry at the nominated locations

Appendix A

Site map showing noise monitoring locations
Huntstown, Finglas, Co.Dublin.

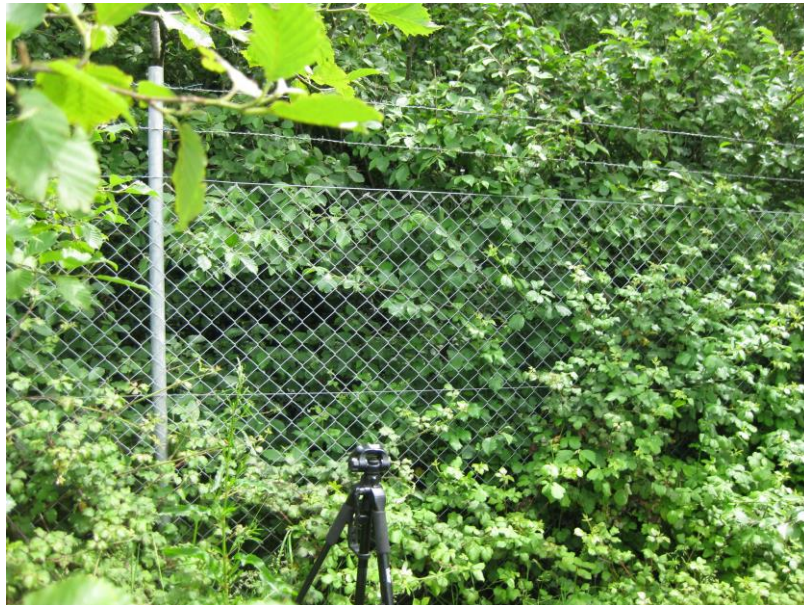


Appendix B

Photographs of Noise Monitoring equipment on-site during monitoring



Noise monitoring equipment at Monitoring Location N1



Noise monitoring equipment at Monitoring Location N2



Noise monitoring equipment at Monitoring Location N3



Noise monitoring equipment at Monitoring Location N4

APPENDIX B

Dust Monitoring Reports

Client: Roadstone Limited

Fortunestown
Tallaght
Dublin
Co. Dublin

BHP Ref. No: 17/07/1056-1061
Quote Ref: QC001137
Order No: To Follow
Sales Order: 28423
Date Received: 12/07/2017
Date Sampled: 12/07/2017
Date Completed: 17/07/2017
Sample Type: Environmental Dust
Sampling Period: 08/06/2017 - 12/07/2017



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Analysing
Consulting



BHP Laboratories
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Tel: +353 61 455399
Fax: +353 61 455447
Email: colettehannan@bhp.ie

FTAO: Bernadette Azzie
Site: Huntstown Quarry
BHP Ref: Monthly_ Environmental Dust

TestName	ClientRef	Units	Results	DateAnalysed	Method
Dust Deposition Acc	D1	mg/m ² /day	139	17/07/2017	BHP AC 017
Inorganic Deposition	D1	mg/m ² /day	101	17/07/2017	BHP AC 017
Organic Deposition	D1	mg/m ² /day	38	17/07/2017	BHP AC 017
Dust Deposition Acc	D2	mg/m ² /day	245	17/07/2017	BHP AC 017
Inorganic Deposition	D2	mg/m ² /day	199	17/07/2017	BHP AC 017
Organic Deposition	D2	mg/m ² /day	46	17/07/2017	BHP AC 017
Dust Deposition Acc	D3	mg/m ² /day	128	17/07/2017	BHP AC 017
Inorganic Deposition	D3	mg/m ² /day	83	17/07/2017	BHP AC 017
Organic Deposition	D3	mg/m ² /day	45	17/07/2017	BHP AC 017
Dust Deposition Acc	D4	mg/m ² /day	134	17/07/2017	BHP AC 017
Inorganic Deposition	D4	mg/m ² /day	52	17/07/2017	BHP AC 017
Organic Deposition	D4	mg/m ² /day	82	17/07/2017	BHP AC 017
Dust Deposition Acc	D5	mg/m ² /day	166	17/07/2017	BHP AC 017
Inorganic Deposition	D5	mg/m ² /day	123	17/07/2017	BHP AC 017
Organic Deposition	D5	mg/m ² /day	43	17/07/2017	BHP AC 017
Dust Deposition Acc	D6	mg/m ² /day	See Note		BHP AC 017
Inorganic Deposition	D6	mg/m ² /day	See Note		BHP AC 017
Organic Deposition	D6	mg/m ² /day	See Note		BHP AC 017

Authorised by:

Colette Hannan
Technical Manager

Date Authorised: 19/07/2017**Additional Information:** (Opinions, where stated, are not covered by accreditation)**Acc.:** INAB Accredited**Notes:** All sample locations were inside the EPA limit of 350 mg/m²/day.

Total dust residues were ashed at 600°C for 1 hour to determine inorganic dust deposition.

Organic deposition was determined by subtracting the inorganic dust deposition from the total dust deposition.

Sample Conditions: All samples in acceptable condition.

Client: Roadstone Limited

Fortunestown
Tallaght
Dublin
Co. Dublin

BHP Ref. No: 17/11/1011-1016
Quote Ref: QC001137
Order No: To Follow
Sales Order: 33731
Date Received: 07/11/2017
Date Sampled: 07/11/2017
Date Completed: 10/11/2017
Sample Type: Environmental Dust
Sampling Period: 10/10/2017 - 07/11/2017



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FTAO: Bernadette Azzie
Site: Huntstown Quarry
BHP Ref: Monthly_ Environmental Dust

TestName	ClientRef	Units	Results	DateAnalysed	Method
Dust Deposition Acc	D1	mg/m ² /day	174	10/11/2017	BHP AC 017
Inorganic Deposition	D1	mg/m ² /day	106	10/11/2017	BHP AC 017
Organic Deposition	D1	mg/m ² /day	68	10/11/2017	BHP AC 017
Dust Deposition Acc	D2	mg/m ² /day	114	10/11/2017	BHP AC 017
Inorganic Deposition	D2	mg/m ² /day	46	10/11/2017	BHP AC 017
Organic Deposition	D2	mg/m ² /day	68	10/11/2017	BHP AC 017
Dust Deposition Acc	D3	mg/m ² /day	87	10/11/2017	BHP AC 017
Inorganic Deposition	D3	mg/m ² /day	46	10/11/2017	BHP AC 017
Organic Deposition	D3	mg/m ² /day	41	10/11/2017	BHP AC 017
Dust Deposition Acc	D4	mg/m ² /day	349	10/11/2017	BHP AC 017
Inorganic Deposition	D4	mg/m ² /day	141	10/11/2017	BHP AC 017
Organic Deposition	D4	mg/m ² /day	208	10/11/2017	BHP AC 017
Dust Deposition Acc	D5	mg/m ² /day	109	10/11/2017	BHP AC 017
Inorganic Deposition	D5	mg/m ² /day	58	10/11/2017	BHP AC 017
Organic Deposition	D5	mg/m ² /day	51	10/11/2017	BHP AC 017
Dust Deposition Acc	D6	mg/m ² /day	232	10/11/2017	BHP AC 017
Inorganic Deposition	D6	mg/m ² /day	198	10/11/2017	BHP AC 017
Organic Deposition	D6	mg/m ² /day	34	10/11/2017	BHP AC 017

Authorised by:

Colette Hannan
Technical Manager

Date Authorised: 15/11/2017**Additional Information:**(Opinions, where stated, are not covered by accreditation)**Acc.:** INAB Accredited**Notes:** All sample locations were inside the EPA limit of 350 mg/m²/day.

Total dust residues were ashed at 600°C for 1 hour to determine inorganic dust deposition.

Organic deposition was determined by subtracting the inorganic dust deposition from the total dust deposition.

Sample Conditions: All samples in acceptable condition.

APPENDIX C

Breeding Bird Survey

HUNTSTOWN WASTE RECOVERY FACILITY

Breeding Bird Survey April 2017
Prepared for: Roadstone Limited

:
SLR Ref: 428.02036.00495
Version No:1
May 2017



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1.0 Introduction

1.1 Background

SLR Consulting was commissioned by Roadstone Ltd to undertake a breeding bird survey of all suitable and accessible habitats within Huntstown Waste Recovery Facility (the Site). These surveys were required to satisfy Condition 6.14 of Waste Licence W0277-01 that states:

“The licensee shall carry out an annual breeding bird survey, unless otherwise required by the Agency. The survey shall record the number of birds of conservation concern utilising the site. The results of this assessment shall be reported as part of the Annual Environmental Report.”

The outcome of the survey would inform whether or not there were species of conservation concern using the site. The surveys were undertaken by Dr Rhys Bullman a Principal Ornithologist from SLR Consulting.

1.2 Aims and objectives

The aim of the 2017 breeding bird survey at the Site is to provide information on the status of the breeding bird community with specific reference to species of conservation concern.

The objectives of the survey are as follows:

- to assess the number of active bird territories present in suitable habitats within the overall site margins and to map active nests where present;
- to evaluate the overall community of birds present on the overall site by recording all behavioural activity of non-territorial birds e.g. birds in flight;
- to identify and areas of the overall site that may merit special consideration should quarry activities or habitat change be planned during the bird breeding season.

2.0 Methodology

The breeding birds survey was undertaken on 25/05/17 between 08:00 and 10:00, the weather conditions were suitable with light winds, no rain and good visibility.

The Common Bird Census (CBC) method was used and the survey followed a transect route around the entire site covering all the suitable breeding habitats present. The vast majority of the survey area considered was open ground, waste recovery facility for the backfilling of the quarry void and part of an active quarry and as such the habitats available for breeding birds on this site are very limited.

All birds either seen or heard were recorded and the standard BTO behaviour codes used. Where birds were clearly territorial then this was noted. As this one a single survey it is not possible to determine if these territories remained but for the sake of this report it is assumed that they were all active at the time of the survey.

Non territorial birds were also recorded i.e. birds in flight, birds not calling but foraging or loafing. Notes were also made on the habitats that the birds were using within each survey section.

For full details of the CBC method, see Gilbert *et al.* 1998¹.

¹ Common Bird Census in Gilbert, G., Gibbons, D.W. & Evans J. (1998) Bird Monitoring Methods: a manual of techniques of key UK species. RSPB, BTO, WWT, JNCC, ITE and the Seabird Group, pp 386 – 388.

3.0 Results

The habitats within the survey area consist mostly of open ground quarry workings with ephemeral ponds and some peripheral scrub and semi mature trees at the quarry margins which is the only suitable habitat for breeding birds.

A summary of the birds listed as either Red or Amber birds of conservation concern in Ireland (BoCCI), see Colhoun and Cummins (2013²) are shown in Table 1. The BoCCI is the third assessment of the status of all regularly occurring birds on the island of Ireland. The criteria on which the assessment is based include international conservation status, historical breeding declines, recent population declines (numbers and range in breeding and nonbreeding seasons), European conservation status, breeding rarity, localised distribution, and the international importance of populations. The number of Red-listed species has increased by twelve and Amber-listed species by five since the previous review in 2007.

A total of 20 species were recorded during the survey either singing or foraging within the habitats on the survey areas or flying over or passing through the site. Seven of these species were assessed as being territorial and nesting within the survey area (see Table 1)

Of the 20 species recorded, 8 were Amber listed on the BoCCI: house martin, lesser black backed gull, linnet, robin, sand martin, starling, swallow and wheatear and two were Red listed: herring gull and meadow pipit.

Birds in flight over and around the site included corvids, wood pigeon and numerous foraging hirundines: swallows, house martins and sand martins.

Details of all the species recorded and notes on their activities are given in Table 1.

² Colhoun, K. & Cummins, S. (2013) Birds of Conservation Concern in Ireland 2014 – 2019. Irish Birds, 9, 523 - 544

Table1: Birds recorded in Huntstown Waste Recovery Facility

Species recorded	Number of active territories	Notes on other activity	Conservation status
Buzzard	0	One in flight Over the quarry area if breeding in the environs the nest site will be outwith the quarry boundary as there is no suitable breeding habitat on site	-
Blackcap	1	Singing in scrub. Breeding probable	-
Goldfinch	2	Singing in scrub. Breeding probable	-
Great tit	4	Males heard in scrub around the site. Probable breeder	-
Herring gull	0	Occasional birds flying over the site	BoCCI (Red)
Hooded crow	0	No suitable nesting habitat but numerous birds foraging over the site. One bird seen to steal a check that a magpie had already taken	-
House martin	0	Numerous birds flying over the site hawking insects. Possibly nesting on some of the structures within the site.	BoCCI (Amber)
Jackdaw	> 10	Numerous birds on site. Nesting in suitable crevices and on ledges on the rock faces	-
Lesser black backed gull	0	One bird flying over the site	BoCCI (Amber)
Linnet	0	Three birds in flight over scrub. Possibly breeding on site	BoCCI (Amber)
Magpie	0	Four birds in various locations in areas of scrub. No suitable nesting	-

Species recorded	Number of active territories	Notes on other activity	Conservation status
		sites in the survey area. Birds raiding nests.	
Meadow pipit	2	Bird singing (towering) on territory over suitable habitat	BoCCI (Red)
Pied wagtail	0	Two birds feeding on insects over rock piles. Probable breeder	-
Robin	4	Males heard in scrub around the site	BoCCI (Amber)
Sand martin	0	Numerous birds seen flying around the site. Possible colony close by or birds prospecting some of the quarry faces. Little or no suitable habitat and no nest burrows noted on site.	BoCCI (Amber)
Starling	0	One bird seen flying over the site but there is suitable habitat for this species in the survey area	BoCCI (Amber)
Swallow	0	Numerous birds flying through and over the site. No suitable structures identified for nesting	BoCCI (Amber)
Wheatear	0	Male bird moving around on rock and gravel piles. Probable breeder.	BoCCI (Amber)
Woodpigeon	0	Seven birds foraging within the areas of scrub probable breeder on site but no nesting activity seen	-
Wren	5	Males seen and heard singing in scrub	-

4.0 Summary

This breeding bird survey identified a total of 20 species present at and within the vicinity of the Waste Recovery Facility at Huntstown, seven of which were territorial.

Of the 20 species recorded, 8 were Amber listed on the BoCCI: house martin, lesser black backed gull, linnet, robin, sand martin, starling, swallow and wheatear and two were Red listed: herring gull and meadow pipit. However, only meadow pipit and robin are likely to be breeding in the vicinity of the Waste Recovery Facility where suitable habitat is present around the peripheries of the site and/or where suitable habitat is available in restored areas.

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APPENDIX D

Stability Assessment Data

APPENDIX E

Tank And Pipeline Testing And Inspection Report



Environmental
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Lisburn (Co. Antrim) 028 9262 6733
Birmingham (U.K.) 0121 673 1804
Cork 021 4536155

Bund Integrity Assessment

Roadstone Ltd.

Site/Quarry: Huntstown

Document Number 1690-01 v2.00

Email: energy@enviro-consult.com www.enviro-consult.com

Registered Office: Parnell House, 19 Quinsboro Road, Bray, Co. Wicklow A98 XV04. Registered Number 243 412

Directors: Robert B. Sutcliffe, Ronan T. Sutcliffe

Environmental Services for Industry Including –

- ▶ Air, Noise & Water Monitoring
- ▶ Bund Testing
- ▶ Environmental Management Systems to ISO 14001
- ▶ Air & Noise Modelling
- ▶ Energy & Water use reduction
- ▶ IPC/IED/Waste Licence Compliance
- ▶ EIS & Planning
- ▶ Occupational Dust & Noise

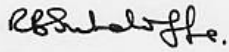
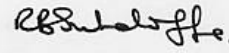
Affiliations & Accreditations

- ▶ ISO9001:2008 Registration No. 2015/2170
- ▶ ISO14001:2004 Registration No. 2012/1427
- ▶ MCERTS Certified personnel for stack testing
- ▶ Member of Royal Society for Prevention of Accidents
- ▶ EMPI Membership



QF 1. v2 Document Lead Sheet

Document Title	Bund Integrity Assessment
Project No.	1690
Document No.	1690-01
Client	Roadstone Wood Ltd
Site	Huntstown

Issue	Status	Date	Author	Signed for and on behalf of	
				Environmental Efficiency	Client
1.00	Approved	6 Oct 2015	RBS		
2.00	Approved	18 May 2016	RBS		

SR02 v1.11

EEC Document Author: Bob Sutcliffe, CEng, MIEI

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History

Issue 1.00 Issued

Issue 2.00 Revised to include additional bunds

1. Summary

Bund ref.	Bund integrity Result	Bund adequate size	Bund suitable construct'n	Bund protected from rain	Refuelling area has interceptor	Essential Action Required	Good practice recommendations
Green Gas Oil	Pass visual	Yes	Yes	No	Yes	None	Roof bund or mark maximum level rain water
Red Diesel	Pass visual	Yes	Yes	No	Yes	None	Roof bund or mark maximum level rain water
Sump pallet, garage, blue plastic #1	Pass visual	Yes	Yes	N/A	N/A	None	Label bund to allow unique identification
Sump pallet, garage, blue plastic #2	Pass visual	Yes	Yes	N/A	N/A	Empty oil from sump	Label bund to allow unique identification
Sump pallet, garage, galvanised steel #3	Pass visual	Yes	Yes	N/A	N/A	Empty oil from sump	Label bund to allow unique identification
Drum pallet, garage #4	Pass visual	Yes	Yes	N/A	N/A	None	Label bund to allow unique identification
Sump pallet, garage, blue steel #5	Fail visual	No	Yes	N/A	N/A	Scrap	Label bund to allow unique identification
Drum store, garage	Pass visual	Yes	Yes	N/A	N/A	None	None
Waste oil tank	Pass visual	Yes	Yes	N/A	N/A	None	None

2. Bund inspection results

2.1 Green gas oil tank bund

Table 2-1 Bund integrity assessment

Aspect	Value/Finding	Comment
Date of Assessment	9-Oct 15	
Bund type	Local	
Bund construction	Steel	
Capacity	Sufficient	
Defects	None	
Assessment result	Pass	

Table 2-2 Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	No (Fail)	Best practice is to protect from rain.
Maximum quantity of rainwater marked?	No (Fail)	Best practice is to mark maximum allowable level of rain water.
Is rainwater discharged by gravity?	Yes (Fail)	Outlet plug observed. Best practice is not for gravity discharge.
Is rainwater discharge point securely locked?	No (Fail)	Best practice is to securely lock access to discharge point.
Are tank filling points within bund?	Yes (Pass)	Best practice is for tank filling points to be within the bund.
Do pipes pass through bund wall?	N/A as bund of steel construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	N/A as bund of steel construction	Only applicable for block and plastic bunds.

Table 2-3 Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	Yes	
Impermeable ground?	Yes	
Interceptor?	Yes	
Defects	None	

Essential action

- None

Good practice

- Roof bund or mark maximum level rain water



Figure 1 Bund identification

2.2 Red diesel tank bund

Table 2-4 Bund integrity assessment

Aspect	Value/Finding	Comment
Date of Assessment	9-Oct 15	
Bund type	Local	
Bund construction	Steel	
Capacity	Sufficient	
Defects	None	
Assessment result	Pass	

Table 2-5 Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	No (Fail)	Best practice is to protect from rain.
Maximum quantity of rainwater marked?	No (Fail)	Best practice is to mark maximum allowable level of rain water.
Is rainwater discharged by gravity?	Yes (Fail)	Outlet plug observed. Best practice is not for gravity discharge.
Is rainwater discharge point securely locked?	No (Fail)	Best practice is to securely lock access to discharge point.
Are tank filling points within bund?	Yes (Pass)	Best practice is for tank filling points to be within the bund.
Do pipes pass through bund wall?	N/A as bund of steel construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	N/A as bund of steel construction	Only applicable for block and plastic bunds.

Table 2-6 Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	Yes	
Impermeable ground?	Yes	
Interceptor?	Yes	
Defects	None	

Essential action

- None

Good practice

- Roof bund or mark maximum level rain water



Figure 2 Bund identification

2.3 Sump pallet, garage, blue plastic #1

Table 2-7 Bund integrity assessment

Aspect	Value/Finding	Comment
Date of Assessment	27 April 2016	
Bund type	Local	
Bund construction	Plastic	
Capacity	Sufficient	
Defects	None	
Assessment result	Pass	

Table 2-8 Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes	Bund under cover.
Maximum quantity of rainwater marked?	N/A	Bund under cover.
Is rainwater discharged by gravity?	N/A	Bund under cover.
Is rainwater discharge point securely locked?	N/A	Bund under cover.
Are tank filling points within bund?	N/A	No tank
Do pipes pass through bund wall?	N/A as bund of plastic construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	No	Not in a highly trafficked area

Table 2-9 Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	No	
Impermeable ground?	N/A	
Interceptor?	N/A	
Defects	N/A	

Essential action

- None

Good practice

- Label bund to allow unique identification



Figure 3 Bund identification

2.4 Sump pallet, garage, blue plastic #2

Table 2-10 Bund integrity assessment

Aspect	Value/Finding	Comment
Date of Assessment	27 April 2016	
Bund type	Local	
Bund construction	Plastic	
Capacity	Sufficient	Sump half full of oil
Defects	None	
Assessment result	Pass	

Table 2-11 Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes	Bund under cover.
Maximum quantity of rainwater marked?	N/A	Bund under cover.
Is rainwater discharged by gravity?	N/A	Bund under cover.
Is rainwater discharge point securely locked?	N/A	Bund under cover.
Are tank filling points within bund?	N/A	No tank
Do pipes pass through bund wall?	N/A as bund of plastic construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	No	Not in a highly trafficked area.

Table 2-12 Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	No	
Impermeable ground?	N/A	
Interceptor?	N/A	
Defects	N/A	

Essential action

- Empty oil from sump

Good practice

- Label bund to allow unique identification



Figure 4 Bund identification

2.5 Sump pallet, garage, galvanised steel

Table 2-13 Bund integrity assessment

Aspect	Value/Finding	Comment
Date of Assessment	27 April 2016	
Bund type	Local	
Bund construction	Steel	
Capacity	Sufficient	Sump 2/3 full oil
Defects	None	
Assessment result	Pass	

Table 2-14 Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes	Bund under cover.
Maximum quantity of rainwater marked?	N/A	Bund under cover.
Is rainwater discharged by gravity?	N/A	Bund under cover.
Is rainwater discharge point securely locked?	N/A	Bund under cover.
Are tank filling points within bund?	N/A	No tank
Do pipes pass through bund wall?	N/A as bund of steel construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	N/A as bund of steel construction	Only applicable for block and plastic bunds.

Table 2-15 Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	No	
Impermeable ground?	N/A	
Interceptor?	N/A	
Defects	N/A	

Essential action

- Empty oil from sump

Good practice

- Label bund to allow unique identification



Figure 5 Bund identification

2.6 Drum pallet, garage

Table 2-16 Bund integrity assessment

Aspect	Value/Finding	Comment
Date of Assessment	27 April 2016	
Bund type	Local	
Bund construction	Steel	
Capacity	Sufficient	
Defects	None	
Assessment result	Pass	

Table 2-17 Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes	Bund under cover.
Maximum quantity of rainwater marked?	N/A	Bund under cover.
Is rainwater discharged by gravity?	N/A	Bund under cover.
Is rainwater discharge point securely locked?	N/A	Bund under cover.
Are tank filling points within bund?	N/A	No tank
Do pipes pass through bund wall?	N/A as bund of steel construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	N/A as bund of steel construction	Only applicable for block and plastic bunds.

Table 2-18 Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	No	
Impermeable ground?	N/A	
Interceptor?	N/A	
Defects	N/A	

Essential action

- None

Good practice

- Label bund to allow unique identification



Figure 6 Bund identification

2.7 Sump pallet, garage, blue steel #5

Table 2-19 Bund integrity assessment

Aspect	Value/Finding	Comment
Date of Assessment	27 April 2016	
Bund type	Local	
Bund construction	Steel	
Capacity	Sufficient	
Defects	Dent	Dent has reduced height of bund resulting in insufficient capacity
Assessment result	Fail	Suggest scrap bund

Table 2-20 Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes	Bund under cover.
Maximum quantity of rainwater marked?	N/A	Bund under cover.
Is rainwater discharged by gravity?	N/A	Bund under cover.
Is rainwater discharge point securely locked?	N/A	Bund under cover.
Are tank filling points within bund?	N/A	No tank
Do pipes pass through bund wall?	N/A as bund of steel construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	N/A as bund of steel construction	Only applicable for block and plastic bunds.

Table 2-21 Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	No	
Impermeable ground?	N/A	
Interceptor?	N/A	
Defects	N/A	

Essential action

- Scrap/replace

Good practice

- Label bund to allow unique identification



Figure 7 Bund identification

2.8 Drum store, garage

Table 2-22 Bund integrity assessment

Aspect	Value/Finding	Comment
Date of Assessment	27 April 2016	
Bund type	Local	
Bund construction	Masonry	
Capacity	Sufficient	
Defects	None	
Assessment result	Pass	

Table 2-23 Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes	Bund under cover.
Maximum quantity of rainwater marked?	N/A	Bund under cover.
Is rainwater discharged by gravity?	N/A	Bund under cover.
Is rainwater discharge point securely locked?	N/A	Bund under cover.
Are tank filling points within bund?	N/A	No tank
Do pipes pass through bund wall?	No	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	Yes	Only applicable for block and plastic bunds.

Table 2-24 Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	No	
Impermeable ground?	N/A	
Interceptor?	N/A	
Defects	N/A	

Essential action

- None

Good practice

- None



Figure 8 Bund identification

2.9 Waste oil tank

Table 2-25 Bund integrity assessment

Aspect	Value/Finding	Comment
Date of Assessment	27 April 2016	
Bund type	Local	
Bund construction	Steel double skinned tank	
Capacity	Sufficient	
Defects	None	
Assessment result	Pass	

Table 2-26 Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes	Double skinned.
Maximum quantity of rainwater marked?	N/A	Double skinned.
Is rainwater discharged by gravity?	N/A	Double skinned.
Is rainwater discharge point securely locked?	N/A	Double skinned.
Are tank filling points within bund?	Yes	Double skinned
Do pipes pass through bund wall?	N/A as bund of steel construction	Only applicable for masonry bunds
Is bund protected from vehicle strikes?	N/A as bund of steel construction	Only applicable for block and plastic bunds.

Table 2-27 Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	No	
Impermeable ground?	N/A	
Interceptor?	N/A	
Defects	N/A	

Essential action

- None

Good practice

- Label 'for waste oil' or similar wording



Figure 9 Bund identification

APPENDIX F

Energy Efficiency Audit Report

ISO 50001 Roadstone Ltd.

Internal Audit Form

Doc. No.: ECL/01
Revision No: 1
Revision Date: 07/9/16
Approved By: K D / T O'M

Audit Date	Location	Audit Type	Audit No eg. 2017/001	Auditor	
1 st Mar'17	Huntstown Recycling	Compliance <input type="checkbox"/> Process <input type="checkbox"/> Performance <input type="checkbox"/> Other <input type="checkbox"/>	2017 / 1	Print Name	Kevin Donovan
				Signature	
Circulation	Leonard Grogan, John Fennel, Tim O'Mahony, Richard McDonnell, John Glynn				

Items to be addressed: Responsible Persons & Timeframe

<u>Item</u>	<u>Description</u>	<u>Responsibility</u>	<u>Time Frame</u>
Item 1	Develop Energy Management Folder – Ref Appendix 1.	Leonard Grogan & John Fennel	March 2017
Item 2	Complete Location Drawing	Leonard Grogan & John Fennel	May 2017 Ongoing
Item 3	Investigate Possibility of integration into EFT System	Leonard Grogan & John Fennel	May 2017
Item 4	Create PC Based Spreadsheet to include pumping data and associated generator fuel data.	Leonard Grogan & John Fennel	June 2017
Item 5	Develop Location Drawings to include Lighting and Heating Loads associated with administration buildings.	Leonard Grogan & John Fennel	October 17
Item 6	Investigate Bowser to establish if an energy baseline can be developed.	Leonard Grogan & John Fennel	June 2017
Item 7	Develop Location Drawings to include how water moves around the location.	Leonard Grogan & John Fennel	December 17
Item 8	Transpose data associated with mobile plant into an excel format.	Leonard Grogan & John Fennel	April 17
Item 9	Use KPI data to develop internal awareness campaigns and training.	Leonard Grogan & John Fennel	May 17

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Finding Ref	Ancillary Activities	Audit Finding & Action Required	Cat
KD1/1	Energy Management System	An Energy Management Folder containing appropriate information could be retained at the Location and updated on an ongoing basis. The Contents of the Folder are detailed in Appendix 1. Item 1.	3
KD1/2		A drawing should be completed for the Location indicating what machines are used, the fuel point, the pumps and how water is moved about the Location including the sprinklers. The Location of the Administration Areas. Item 2	3
KD1/3	Electrical Bill Report – MIC Vs Max Demand / Wattless / c/kWh	The electricity supplied to the recycling plant is on the same Network at the Huntstown Quarry Location.	3
KD1/4	Details of the non-operational Hour Load at the Location.	There is no kWh reports for the recycling plant office, weighbridge and canteen. It may be an option to add this element into the Quarry Locations EFT (Electrical Sub-meter Platform). This will result in a separate electrical bill and electrical profile for this element. Item 3 If it were possible to add a sub-meter to the recycling plant it would be possible to determine if items are left on during non-operational hours.	3
KD1/5	Define Water Pumping Requirement / Control Measures / Hrs Operation / Cost c/kWh	Generators are used to pump water from the Location. There is a report at the Location that details the fuel added to the generator. This should be developed so that it is in a formal excel report within the Energy Management System detailing if possible L/Hr & L/M3 Water Pumped. Item 4	3
KD1/6	Detail Lighting & Heating Load Breakdown	Location Drawings should also be updated to include Lighting & Heating Load and associated control measures such as contactors, timers, occupancy sensors etc. As discussed during the audit the drawings should facilitate the calculation of the lighting & heating requirement kW and associated costs. Item 5	3
KD1/7	Is there a Compressed Air Load at Location	No Compressors presently at the Location.	3
KD1/8	Review Administration Buildings	EFT presently does not give access to Recycling Plant Administration Buildings.	3
KD1/10	Specific Awareness & Training/Housekeeping	Training was completed on the day of the Audit including a Location Meeting that refers to all elements appropriate to energy management at the Location.	3

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KD1/11	Details of Associated Energy Management Projects	Projects raised during audit must be included in Road Maps.	3
KD1/12	Opportunities Raised	Items 1-5	3

Finding Ref	Infill Process	Audit Finding	Cat
KD1/13	Details of Plant Drawings	The infilling process is completed on a phased bases in a controlled manner. The Mobile Plant completing the tasks are two Dozers and an excavator that is shared with the quarry.	3
KD1/14	Efficiency of Pumping Requirement	<p>There is a generator at the Location that is supplying power to the pumps. The Fuel added to the generator is compiled in a hand written report.</p> <p>Lagoons are currently being constructed at the Location. Water will move through a series of lagoons prior to use within the dust suppression sprinklers that are currently also being constructed.</p> <p>This may reduce the requirement for the road sweeper. Data could be collected on the road sweeper as if the associated savings are 30,000Litres the associated EEOS Rebate (Energy Efficiency Obligation Scheme) would be ~€3,500. This rebate would finance the electrical metering at the Location. Item 6</p>	3 3
KD/15	Description and details of Generators	Details of the Generator should be included in the Location Drawings.	3
KD1/16	Dust Suppression	As stated drawing indicating how water is moved around the Location should be developed. Water will be pumped around the Location for sprinklers and within the process and for dust suppression. We should establish what is the energy requirement associated with sprinklers and m3 of water pumped. Subsequently if upgraded as detailed above we would know the energy management savings. Item 7	3
KD1/17	Opportunities Raised	Item 6 – 7	3

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Finding Ref	Mobile Plant	Audit Finding	Cat
KD1/18	Description of Mobile Plant Requirement	<p>There are two Dozers, an Excavator that is shared with the quarry and a fuelling bowser at the Location.</p> <p>One of the Dozers will soon be replaced with a new dozer.</p> <p>Data form the previous set up should be established on spreadsheets in order to establish if the new dozer is more energy efficient. This data can also be included with the road-sweeper data and possible EEOS application. Item 8</p>	3
KD1/19	Details of Suitability to Tasks	Machines were operated in an efficient manner, no plant or equipment were operating in idle mode, movement within and around the infilling site was in an efficient manner.	3
KD1/20	Access to data and associated details	<p>Data is gathered by Brian Maguire for all mobile plant and retained within a Folder at the Weighbridge.</p> <p>The relevant data should be imputed into an excel file so that the relevant information can be trended and KPI's established.</p> <p>This data would indicate fluctuations that may later be investigated. The data can also be used within internal driver training programs and could be posted on a communication board in the canteen so that the drivers become more aware of their energy KPI's. Item 9</p>	3
KD1/21	Driver Specific Awareness & Training Details / Housekeeping	Once data is captured and KPI's established internal site specific training could be completed.	3
KD1/22	Details of Associated Energy Management Projects	N/A	
KD1/23	Opportunities Raised	Items 8-9 and Evaluate training requirements.	3

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Appendix 1

Energy Management Folder Contents:

- A. Site Drawings
- B. Minutes of Meetings
- C. Internal / External Audits
- D. Training
- E. Projects

Appendix 2

Audit Pictures



KPI Data should be developed for the Dozers and can be used for Projects, Internal Training and Communication.

Plate 1 – Mobile Plant working at the Location

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The Road Sweeper was operating at the Location. Once sprinklers are operation the bowser hrs may be reduced.

Plate 2 – Road Sweeper and Sprinklers under Construction

Appendix 3

Categories of Audit Findings Explanation

Category 1 – A major non conformance where there is a failure to implement and maintain one or more of the required EnMS elements which would raise doubt as to the capability of the EnMS to achieve Roadstone stated energy policies or meet the Locations energy objectives and targets.

Close out Period – 1 Week

Category 2 – A non conformance where there is a failure to meet the requirements of the EnMS 16001 but is less significant than, and does not meet the definition of a Category 1 non conformance.

Close out Period – 4 Weeks

Category 3 – A comment or a suggestion/opportunity for improvement which can be incorporated into future reviews/upgrades of the EnMS.

Close out Period – 6 Weeks

N/A – Not Applicable in relation to non conformance (can also indicate a positive aspect about the location EnMS)

Close out Period – n/a

APPENDIX G

Closure, Restoration & Aftercare Management Plan



global environmental solutions

**Huntstown Inert Waste Recovery Facility
North Quarry, Huntstown
Finglas, Dublin 11**

**CLOSURE, RESTORATION AND
AFTERCARE MANAGEMENT PLAN (CRAMP)**



September 2015
SLR Ref: 501.00180.00111 CRAMP Rev 2

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EXECUTIVE SUMMARY

Activity Details

Name	Huntstown Soil Recovery Facility
Address	North Quarry, Huntstown, Finglas, Dublin 11
Licence No.	WO277-01
Activities Licensed	<p><i>Class R5 (P):</i> Recycling / reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials (Principal Activity).</p> <p><i>Class R3 :</i> Recycling / reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) which includes gasification and pyrolysis using the components as chemicals.</p> <p><i>Class R13 :</i> Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in Section 5(1)), pending collection, on the site where the waste is produced).</p>

Report Preparation

This closure and restoration / aftercare management plan has been independently prepared on behalf of Roadstone Ltd. by SLR Consulting Ireland, of 7 Dundrum Business Park, Wind Arbour, Dublin 14.

Comparison with Previous Plans

This plan updates a draft closure and restoration / aftercare management plan previously submitted to the EPA by Roadstone Ltd. in December 2013 in support of its waste licence application. However, no financial provision was formally agreed with the EPA on foot of the draft plan at that time.

Overview of the Plan

This closure and restoration / aftercare management plan has had regard to the requirements outlined in Condition 10.3 of the Waste Licence and was prepared in accordance with the EPA publication, *Guidance on Assessing and Costing Environmental Liabilities (2014)*.

Scope

The closure plan envisages that the licensed waste facility will achieve a clean closure, such that, on cessation of waste recovery operations, plant and equipment are decommissioned, decontaminated and/or removed from the facility in order to ensure that the facility presents no environmental liabilities or risk of long-term environmental pollution.

Cost Summary

As a result of this assessment, the total combined cost of the facility closure, restoration and aftercare management is calculated at **€1,534,502.50** (including 15% contingency) of which €913,387.50 is for closure and €621,115 is for aftercare.

Financial Provision

Arising out of this assessment, Roadstone Ltd. is prepared to make the required financial provision in respect of closure and aftercare costs by means of a financial bond submitted under separate cover to the EPA.

Review

This Closure Plan will be reviewed annually and updated where necessary to take account of any facility or process changes, technology changes and costing changes (inflation). Details of the review shall be included in the Annual Environmental Report (AER) submission to the EPA.

1.0 INTRODUCTION

1.1 Huntstown Inert Waste Recovery Facility

The Environmental Protection Agency (hereinafter '*the Agency*' or '*EPA*') issued a waste licence to Roadstone Ltd. (hereinafter '*Roadstone*') in respect of an inert waste recovery facility at Huntstown North Quarry, Finglas, Dublin 11 on 11th February 2015 (Ref. W0277-01). The principal waste activity at the site will be backfilling of the existing quarry void using imported inert soil and stone. It is anticipated that waste activities will commence on-site in the late spring / early summer of 2015.

The waste licence provides for

- Backfilling of up to 7,295,000 tonnes (approximately 3,840,000m³) of naturally occurring waste materials, principally excess inert soil, stones and/or broken rock excavated on construction and development sites, to re-use in backfilling and restoring a large quarry void created by extraction of bedrock;
- Separation of any non-inert construction and demolition waste (principally metal, timber, PVC pipes and plastic) unintentionally imported to site and its temporary storage at a dedicated inspection and quarantine facility, prior to removal off-site to appropriately licensed waste disposal or recovery facilities;
- Restoration of the backfilled void (including placement of cover soils and seeding) and return to natural grassland habitat and
- Environmental monitoring of noise, dust, surface water and groundwater for the duration of the proposed site restoration works and for a short aftercare period.

1.2 Site Description

The licensed inert waste recovery facility is located entirely within the townlands of Huntstown and Kilshane, Co. Dublin, approximately 2.5km north-west of the Dublin suburb of Finglas and 2km north-west of the interchange between the N2 Dual Carriageway and the M50 Motorway. The plan extent of the lands owned by Roadstone Ltd. is outlined in blue on a map of the local area reproduced in Figure 1.

The waste licence facility is located entirely within a large active quarry complex and adjoining concrete and asphalt production facilities operated by Roadstone Ltd. The waste facility covers an area of approximately 36.1 hectares (87.0 acres) and comprises a largely worked-out limestone quarry with perimeter screening / overburden mounds, together with adjoining, established site infrastructure required to operate the inert waste / soil recovery facility. The existing site layout, together with additional infrastructure required to support waste recovery activities, is shown in Figure 2.

The total volume of inert soil waste to be recovered at the licensed facility at Huntstown is 3,840,000m³, (equivalent to approximately 7,295,000 tonnes). It is estimated that 50,000m³ (approximately 95,000 tonnes) of topsoil is available at on-site perimeter screening berms for incorporation into the final restored landform, following backfilling of the worked out quarry, leaving approximately 3,790,000m³ of material to be imported to the recovery facility from off-site locations. The area of the main quarry void to be backfilled has a plan footprint of approximately 12 hectares.

Ground levels across the licensed facility have been significantly disturbed by quarrying activities. The original ground levels around the worked-out quarry vary between approximately 62mOD and 66mOD (Malin) along the eastern face and between 80mOD and 85mOD along the western face. Existing ground levels immediately behind the quarry faces are locally 5m to 10m higher than surrounding ground due to the presence of perimeter screening mounds. The existing quarry void covers an area of approximately 11.2 hectares (27.0 acres) within the overall licensed area.

The existing floor level in the quarry lies at approximately 38mOD to 39mOD and its depth from the original (surrounding) ground level therefore varies from 24m to 28m along its eastern face and 42m to 47m along its western face.

Some restoration work was undertaken at the northern end of the waste licence area in the period from late 2002 to the end of 2003. At that time, a large volume of inert excavation spoil arising from construction of the Dublin Port Tunnel was imported to site and used to backfill the quarry void in that area. Since that time there has been only minor progress in the site restoration works. The future restoration and backfilling work in this area will proceed in accordance with the terms of the waste licence issued by the Agency.

1.3 Planning Status - Former / Existing / Planned Activities

Excavation and blasting of limestone has been carried out across the Huntstown Quarry Complex for the past four decades, following grant of planning permission in or around 1973. A 10 year planning permission (Ref. No. 93A/1134 and P06F.092622) was granted in 1994 to continue quarrying and for production of related concrete materials. Planning permission for the existing construction and demolition waste recycling facility in the centre of the quarry complex was granted in 2002 (Ref. No. F02A/0602 and PL06F.200623). Planning permission was granted in 2004 for continuation of quarrying for a 10 year period (Ref. No. F03A/1430 and PL06F.206789).

The proposal to backfill the North Quarry with in-situ and imported inert soil and stones was part of the quarry restoration works which were previously notified and agreed with Fingal County Council in 2002 in accordance with Condition No. 17 of 1994 planning permission. These works were commenced in the 2002-2003 period, but progressed only intermittently after that time. Quarry backfilling works were previously controlled by a series of waste permits issued by Fingal County Council.

In August 2014, planning permission was secured for continuation of quarrying for a 20 year period (Fingal County Council Ref. No FW12A-0022, An Bord Pleanála Ref. No. 06F.241693). The overall development proposal, which was subject to EIA, included provision for ultimate backfilling and restoration of the North Quarry area. As backfilling with inert waste soil is technically designated a waste activity under national waste management legislation, it was also necessary to obtain an EPA waste licence in respect of this activity.

Roadstone discharges dewatered groundwater and surface water run-off from the North Quarry, together with process water from aggregate washing and concrete production activities, via a series of existing settlement ponds to tributary streams of the Ward River. Discharge for non-waste activities are controlled by way of a licence issued by Fingal County Council in November 2011 (Ref WPW-F008-01). This superseded an earlier discharge licence issued by Dublin County Council in January 1987 (Ref. WPW/1/87).

1.4 Classes of Licensed Waste Activities

The waste licence issued to Roadstone by the Environmental Protection Agency (EPA) provides for the following licensed activities (as per the Fourth Schedule of the Waste Management Acts 1996-2014).

- Class R5 : Recycling / reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials (Principal Activity).
- Class R3 : Recycling / reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) which includes gasification and pyrolysis using the components as chemicals and
- Class R13 : Storage of waste pending any of the operations numbered R1 to R12.

1.5 Licence Requirements

This Closure, Restoration and Aftercare Management Plan (CRAMP) is prepared in compliance with Condition 10.2 of the waste licence for an inert soil waste recovery facility at Huntstown North Quarry, Finglas, Dublin 11 (Ref. W0277-01).

10.2 Closure, Restoration and Aftercare Management Plan (CRAMP)

- 10.2.1 *The licensee shall prepare, prior to the commencement of the activity and to the satisfaction of the Agency, a revised, fully detailed and costed revised plan for the closure, restoration and aftercare of the facility or part thereof.*
- 10.2.2 *The plan shall be reviewed annually and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the agreement of the Agency.*
- 10.2.3 *The licensee shall have regard to the Environmental Protection Agency Guidance on Assessing and Costing Environmental Liabilities (2014) when implementing Condition 10.2.1 and 10.2.2 above.*

1.6 Scope of this CRAMP

In preparing this plan, regard has been had to requirements outlined in Condition 10.3 of the Waste Licence which include

- *A scope statement for the plan;*
- *The criteria that define the successful decommissioning of the activity or part thereof, which ensures minimum impact on the environment;*
- *A programme to achieve the stated criteria;*
- *Where relevant, a test programme to demonstrate the successful implementation of the CRAMP;*
- *Details of the costings for the plan and the financial provisions to underwrite those costs.*

The objective of this CRAMP is to ensure that on completion / cessation of the inert soil waste recovery activities at Huntstown, the formed quarry void will be substantially re-integrated into the surrounding pastoral landscape, with much of the land restored to natural grassland habitat.

The scope of this CRAMP comprises:

- a Site Evaluation, which presents details of its planning history and an inventory of existing mobile plant and fixed infrastructure;
- the Closure Considerations and Criteria for successful closure;
- an outline Closure Plan Costing and measures for the Closure Plan update, review, implementation and validation; and
- the Facility Restoration and Aftercare proposals, including a restoration and aftercare management costing.

The CRAMP has also been prepared in accordance with the recent EPA publication, *Guidance on Assessing and Costing Environmental Liabilities (2014)*.

2.0 SITE EVALUATION

2.1 Operator Performance

2.1.1 Environmental Management Systems

Roadstone implements an Environmental Management System (EMS) at all its facilities in respect of its core quarrying and construction material production activities. In recent years it has extended the scope of the EMS to encompass inert soil / C&D waste recovery activities. A part of its EMS, Roadstone has developed standard procedures to address waste acceptance and handling activities, as well as an emergency response plan.

2.1.2 Compliance History

As previously noted, the excavation and blasting of limestone has been undertaken at the Huntstown Quarry Complex for the past four decades, following grant of planning permission in or around 1973.

Neither Roadstone Ltd. nor any of its predecessor companies (which includes Roadstone Dublin, Roadstone Provinces and John A. Wood), has ever been convicted of any offence under the Waste Management Acts 1996-2014, the Environmental Protection Agency Act 2003 or the Air Pollution Act 1987.

The Huntstown quarry complex has largely operated in compliance with all permits and planning consents and Roadstone has not been subject to enforcement action by the Local Authority. A number of complaints and warning letters in respect of compliance with planning conditions were received by the company between 2007 and 2010 were subsequently addressed and/or resolved by the company.

2.1.3 Incident History

A fuel leak / spill occurred during filling of diesel tanks in early 2013, overflowed at a downstream interceptor and impacted a lagoon to the south of the central infrastructure area (outside the proposed waste licence area). A specialist contractor was called to site to remove spilled fuel in lagoons or sumps of ponding at the ground surface. It also pumped out the ground around the fuel tank and interceptor outflow pipe.

Subsequent groundwater sampling and testing and a follow up site inspection and audit undertaken by AWN Consulting revealed that, following the site clean-up, there was no evidence of ground, surface water or groundwater contamination by hydrocarbons. A qualitative risk assessment undertaken by AWN also indicated that the spill presented a low risk to groundwater quality directly beneath the site and negligible risk to water supply boreholes, surface water bodies and site based personnel or visitors.

2.1.4 Environmental Monitoring

Environmental monitoring of surface water, groundwater, noise and dust is undertaken at designated locations across the licensed facility, at the locations indicated in Figure 3.

There is an established programme of environmental monitoring in connection with ongoing rock extraction, aggregate processing and concrete / asphalt production activity across the Huntstown Quarry Complex. This environmental monitoring programme complies with the requirements of existing planning permissions, waste permits and discharge licences issued by Fingal County Council in respect of established activities.

Surface Water

The inert soil recovery facility to be located in the North Quarry lies in the northern part of the Roadstone landholding, entirely within, albeit at the edge of the Ward River catchment. There is no surface water watercourse located within the licensed facility and the nearest

watercourses are artificial (man made) ditches and/or small tributary streams on the eastern side which flow north to the Ward River, which flows approximately 4km north of the facility.

Groundwater levels at the North Quarry are lowered by means of sumps in the quarry floor. Surface water falling across the quarry and dewatered groundwater are collected in a pond on the eastern side of the quarry floor and pumped to a drainage channel / watercourse at original ground surface level via an existing pipe network. Water pumped to this channel is routed via settlement lagoons to discharge to a tributary stream of the Ward River which runs northwards out of the licensed site.

Surface water sampling and testing is undertaken immediately downstream of the existing settlement lagoons, beyond the eastern face of the North Quarry (at location W4), and upstream of its discharge to the tributary stream of the Ward River (at location W1), as indicated in Figure 3. Surface water samples are tested for a wide range of physical and chemical parameters in order to assess water quality and detect possible contamination. Most recent monitoring (for 2014) indicates that water discharge quality complies with requirements of the existing discharge licence.

Groundwater

There are 6 No. groundwater monitoring wells installed across the Huntstown Quarry Complex. Of these, 2 No. (GW03 and GW04) are located in close proximity to the waste licence boundary, while 2 No. others (GW02 and GW05) occur at a short distance to the south.

The available groundwater quality data for groundwater at Huntstown indicates that it is of good status, with virtually all parameters analysed having ion concentrations lower than the Interim Guideline Values (IGV) set out in the EPA Publication 'Towards setting Guideline values for the Protection of Groundwater in Ireland'. The guideline value for chloride has been exceeded on occasion, but this may be due to proximity to seawater at the coast (12km away). All samples exceeded the guideline for hardness, which is not unusual for groundwater samples from limestone bedrock. Occasional recorded exceedances of guideline values for orthophosphate may be the result of fertiliser application on adjoining agricultural lands.

A septic tank installed to the east of the site offices and north of the existing blockyard currently services toilets, wash hand basins and sink units at the site. The treated effluent from the septic tanks discharges to groundwater via a percolation area. Much of the water demand in Huntstown and the surrounding area is met by a Local Authority mains supply.

Dust

Planning permissions for the ongoing rock extraction, aggregate processing and concrete / asphalt production activities at Huntstown specify an emission limit value for dust deposition (at the site boundary) of 350 mg/m²/day (30 day composite sample) when measured using the conventional 'Bergerhoff' method.

Atmospheric emissions related to site activities are primarily associated with dust emissions associated with aggregate processing and exhaust emissions from traffic to and from the R135 Regional Road (the former N2) and heavy good vehicle (HGV) / truck movements on unpaved roads around the quarry complex.

Dust emissions are monitored using Bergerhoff dust gauges at four locations (D1, D3 and D4) around the licensed facility and at one location within the central infrastructure area (D2), all shown on Figure 3. Monitoring gauges are located closest to emission sources and/or potentially sensitive receptors beyond the Licensee's property boundary.

Dust deposition monitoring undertaken in 2014 indicated that dust deposition levels around the Huntstown Complex were generally low, with average measured dust deposition levels around the perimeter comfortably within the prescribed emission limit value of 350mg/m²/day.

Noise

Planning permissions for associated established activities within Roadstone's landholding specify noise emission limit values of 55 dB(A) L_{Aeq} at the property boundary during day-time hours, with a reduced limit of 45 dB(A) L_{Aeq} during night-time hours.

Noise emissions are monitored on a quarterly (i.e. three monthly) basis at 4 No. locations across the Huntstown complex (designated N1 to N4), all of which are located beyond the licensed site boundary.

Noise surveys undertaken around the Roadstone landholding indicates that in 2013 and 2014, noise levels were elevated about the permissible limits on account of high background noise levels associated with high volume of traffic along the nearby M50 Motorway and N2 Dual Carriageway as well as frequent overhead plane movements in and out of Dublin Airport.

The principal noise impact associated with the operation of the inert soil waste recovery facility will be the increased noise generated by moving HGV trucks and/or earthworks equipment during daytime hours (07:00 to 19:00 hrs). No recovery operations or traffic movements will be undertaken at the recovery facility during either evening time (19:00 to 23:00 hrs) or night-time hours (23:00 to 07:00 hrs).

2.2 Environmental Pathways and Sensitivity

2.2.1 Geology

Topsoil was previously stripped from the site in order to facilitate the development of the North Quarry and is currently stockpiled in mounds across and around the existing site. Soil mapping suggests that the lands surrounding the Huntstown Quarry complex comprise well-drained soils which are suitable for a wide range of agricultural activity, generally grassland or tillage and some poorly drained soil which have more restricted uses, principally as seasonal grassland.

Site inspections indicate that the subsoil profile comprises a significant amount of Made Ground (soil disturbed or placed by human activity) over limited thickness of glacial till and/or rock. There is no evidence of soil contamination at the site.

Most of the Made Ground arises from historical and ongoing extractive activity, principally overburden removal and stockpiling or installation of fixed plant and infrastructure. The effect of this is that few areas of undisturbed soil or subsoil remain across the Huntstown Quarry complex.

The most recent geological map of the local area published by the Geological Survey of Ireland (GSI) indicates that rock around the licensed facility comprises limestones of the Lucan, Feltrim, Malahide and Tober Colleen Formations.

The GSI maps indicate that the geological contact between the Waulsortian Limestones of the Feltrim Limestone Formation and the Tober Colleen Formation is exposed in the roadway leading into the Central Quarry, to the south of the licensed facility and it has identified this feature for future designation as a Natural Heritage Area (NHA) on geomorphological / geological grounds.

2.2.2 Hydrology

The inert soil recovery facility to be located in the North Quarry lies entirely within the Ward River catchment. Rain falling across the licensed facility either

- runs over unsealed ground into the existing quarry void and the sump on the eastern side of the quarry floor
- percolates down through the existing soil / rock at the ground surface as recharge to groundwater, at which point it joins groundwater flow toward the quarry face
- collects in surface water drainage infrastructure installed across the central infrastructure area where aggregate processing and concrete production activities are currently concentrated.

Groundwater levels at the North Quarry are lowered by means of sumps in the quarry floor. Surface water falling across the quarry and dewatered groundwater are collected in the sump on the eastern side of the quarry floor and pumped to an existing drainage channel at original ground surface level via an existing pipe network. Water pumped to this channel is routed via existing settlement lagoons to discharge to a tributary stream which runs northwards out of Roadstone's property, toward the Ward River. This discharge is currently regulated by way of a discharge licence issued by Fingal County Council (Ref. WPW/F/008-01).

The northern portion of the Ward River (known as the Ballystrahan sub-catchment) is classified in the latest EPA assessment of Ireland's rivers (for years 2010-2012) as being of 'poor' status. The Ward River has a median quality which is generally deemed to be unsatisfactory. Siltation by agriculture and urban wastewater discharges are likely to be the principal contributors to reduced water quality in the stream.

2.2.3 Hydrogeology

Bedrock aquifer maps indicate that the Huntstown Quarry complex straddles bedrock formations which are generally considered to be locally important karstified aquifers. Of the three bedrock formations exposed at Huntstown, both the Waulsortian and Malahide Formations are classified by the GSI as locally important aquifers, while the Tober Colleen Formation is classified a poor aquifer.

While there is groundwater seepage into the North Quarry, volumes vary seasonally and are typically low to moderate.

Groundwater vulnerability maps published by the EPA on its website (www.epa.ie) indicate that the licensed site is located in an area with high to extreme groundwater vulnerability status where rock is close to the surface. Groundwater vulnerability reflects the potential for rapid groundwater movement through subsoil deposits into the underlying bedrock aquifer. It is generally high or extreme where subsoil deposits are thin or absent and provide little or no attenuation for potential pollutants or contaminants.

Recent groundwater sampling and testing indicate that groundwater quality at the site is generally good, with established on-site activities shown to have had no significant impact on existing groundwater quality.

2.2.4 Sensitive Receptors

The principal sensitive receptors in the vicinity of the licensed facility comprise a number of private residential properties along the western property boundary, along Kilshane Road.

The receptor locations considered for ecological exposure are those which might be adversely affected by any form of environmental emission. For the purposes of assessment, the most sensitive ecological receptor is deemed to be the locally important aquifers beneath the site. Other receptors could include the tributary to the Ward River. There are no designated nature conservation sites within 2km radius of the licensed facility.

2.2.5 Pathways

The only surface water emission / monitoring point at the licensed facility is the discharge point downstream of the settlement ponds and hydrocarbon interceptor located above the

eastern face of the North Quarry. All surface water run-off across the licensed facility is collected and passed through the existing settlement ponds and drainage infrastructure prior to its ultimate discharge to the Ballystrahan stream, a tributary of the Ward River. The quality of this run-off can be adversely impacted if it comes into contact with loose sediment, hazardous materials or contaminated ground. Water quality is a key indicator of environmental performance and as such, the surface water management infrastructure is a critical environmental pathway for the licensed facility.

As noted previously, some rainfall across the licensed site percolates down through the existing unsaturated zone (in soil / rock close to the ground surface) and recharges to the underlying locally important aquifer. In the event that there is some surface contamination of near-surface soil or ground, this recharge can introduce contaminants to the groundwater body and have an adverse impact on its quality and resource potential. As such, groundwater recharge through the ground is another critical environmental pathway for the licensed facility.

Most noise and dust emissions from the waste recovery facility will be generated by HGV truck movements and by earthworks equipment (bulldozer) engaged in haulage and backfilling activities. There are no fixed (point) noise or dust emission sources at the facility. Air borne emissions of dust and noise transmission from the waste recovery facility have the potential to impact on the occupants of the nearest residential properties.

2.3 Site Processes and Activities

As previously indicated, a significant proportion of the licensed facility has been excavated out and is to be infilled under the terms of the waste licence. The quarry void is still being dewatered of any incipient rainfall or groundwater inflows.

Rock excavated at Huntstown Quarry is used to produce concrete, blocks and asphalt products at the central infrastructure area adjacent to, and surrounded by, the licensed waste facility.

Although the extent of the licensed waste facility seeks to avoid conflict with other on-site activities (including concrete, asphalt and block production areas), it includes access roadways and all shared infrastructure necessary for the soil waste recovery activities (including offices, wheelwash, weighbridge, maintenance garage, hardstand areas etc.).

When operational, the waste recovery activity will provide for

- Importation and acceptance of inert soil, stones and/or broken rock
- Placement and compaction of the imported materials in backfilling and restoring the quarry void;
- Separation of any non-inert construction and demolition waste (principally metal, timber, PVC pipes and plastic) unintentionally imported to site;
- Transfer of any separated waste streams to the waste inspection and quarantine facility for temporary storage pending inspection, testing and potential removal to off-site waste disposal or recovery facilities;
- Stockpiling and storage of imported topsoil and/or subsoil pending re-use as cover material in the final phase of restoration;
- Environmental monitoring of noise, dust, surface water and groundwater for the duration of the proposed site restoration works and for a short aftercare period.

2.4 Site Inventory / Infrastructure

The established site facilities, mobile plant and fixed infrastructure at the waste recovery facility at Huntstown are listed below. Most of the site facilities and infrastructure are shared with the adjoining / co-located construction material production facility and have been in place for many years. The locations of the principal site facilities are shown on Figure 2.

- Buildings: site office, staff welfare facilities, canteen, plant maintenance building; waste quarantine shed, laboratory, weighbridge office.
- Site Security: security barriers at the existing site access point are manned by security staff on a 24 hour, 7 day a week basis.
- Fixed Infrastructure: paved / unpaved internal road network; paved employee and visitor parking areas, hardstanding, wheelwash; weighbridge, fuel / oil storage facilities, conveyor belt.
- Services: overhead electricity wires, water supply pipes (connected to local authority watermain), septic tank and associated sewerage pipework serving welfare facilities;
- Surface Water: sumps, pipelines, drains, settlement ponds and hydrocarbon interceptor;
- Plant and Machinery: re-fuelling plant; mechanical excavators; bulldozers; pumps.

Assuming co-located production activities continue following cessation of waste recovery activities at Huntstown, much of this infrastructure (either existing or replaced) will remain in place and continue to be used after that time.

2.5 Inventory of Raw Materials, Product and Waste

Table 1 overleaf provides an inventory of the raw materials, products and waste stored at the recovery facility. Most of the materials stored are oils, fuels and lubricants required for ongoing maintenance and repair of plant and equipment used in recovery activities.

Table 1
Inventory of Raw Materials, Products and Waste

Type	Storage Area	Storage Type	Maximum Storage Capacity	Measurement Unit
Road Diesel	External Tanks	Bunded Tank	40,000	Litres
Marked Diesel (Gasoil)	External Tanks	Bunded Tank	53,000	Litres
Diesel Engine Lubricant	Back Room in Maintenance Shed	Double Skinned Steel Tank	2,730 (600 gallon)	Litres
Hydraulic Oil	Back Room in Maintenance Shed	Double Skinned Steel Tank	2,730 (600 gallon)	Litres
Transmission Fluid	Back Room in Maintenance Shed	Double Skinned Steel Tank	1,365 (300 gallon)	Litres
Waste Oil	Back Room in Maintenance Shed	Double Skinned Steel Tank	2,730 (600 gallon)	Litres
Hydrocarbon Fluids and Gels	Maintenance Shed	Bunded Area or Bunded Tanks	200 litres	Litres

3.0 FACILITY CLOSURE

3.1 Closure Considerations

This closure plan envisages that the licensed waste facility will achieve a clean closure, such that, on cessation of waste recovery operations, plant and equipment are decommissioned, decontaminated and/or removed from the facility in order to ensure that the facility presents no risk of environmental pollution.

On suspension or unplanned cessation of waste recovery activities,

- the landform within the quarry void will be graded, rolled and compacted to create a uniform stable surface (flat or at shallow slope angle);
- any temporary settlement ponds at the base of the filling area will be dewatered and infilled with inert soil and stone;
- all mobile plant and equipment associated with the backfilling, placement and compaction of backfilled materials will be removed off-site;
- any dedicated water pumping and transmission infrastructure (flexible piping carrying surface water run-off and dewatered groundwater) will be maintained in place and operated for a 36 month period following facility closure;
- the dedicated silt trap / hydrocarbon interceptor tank will be emptied and decontaminated; deposited silts will be removed from the wheelwash and the septic tank will be desludged. All wastes arising will be transferred off-site to appropriately licensed waste disposal or recovery facilities;
- any unused oil and fuel storage tanks will be emptied and decontaminated. Unused oil and fuel will be removed off-site and used elsewhere;
- any unused oils, greases, lubricants, chemicals stored in the maintenance shed will be removed off-site and re-used elsewhere. Other hazardous materials will be removed to appropriately licensed waste disposal or recovery facilities;
- any materials which are stored on site and found to exceed inert waste acceptance criteria will be transferred off-site by licensed waste contractors to a suitably licensed waste disposal or recovery facility;
- environmental monitoring will continue over the period of the closure works (note however that provision will be made for monitoring over a 36 month period following facility closure.
- attendance by security staff (with a patrolling vehicle) at the facility for a 36 month period following facility closure.

As much of the storage and maintenance infrastructure within the recovery facility is shared with the adjoining stone, concrete and asphalt production activities, any storage tanks, drums, IBCs etc. holding fuel, oil or compounds (and related wastes) which could be required for the continued operation of those facilities will be retained and will not be decommissioned, demolished or removed off site.

3.2 Criteria for Successful Closure

The principal objective of the closure plan is to achieve clean closure of the site, with no residual risk of environmental pollution, particularly to soil or groundwater.

The principal criteria against which successful closure will be gauged are as follows:

- the existing landform within the quarry void will be uniformly graded and stable;
- all dedicated mobile plant and equipment associated with the recovery activity (specifically backfilling, soil placement and compaction) will have been decontaminated and/or removed off site;

- any potential pollutants and/or wastes associated with the recovery activity will have been removed off site.

3.3 Closure Plan Costing

The expected costs (present-day values), associated with the future closure of the waste recovery facility at the North Quarry at Huntstown, are outlined in Table 2 below. Note that the costs provided for assume a worst case scenario, where there is unexpected shut down of the facility, with no on-site activities or resources to cover facility closure or environmental protection costs.

Table 2
Waste Recovery Facility Closure Costs

ACTIVITY	QUANTITY	UNITS	RATE (€)	COST (€)	SOURCE
Remove all mobile plant (mechanical excavator and bulldozer) off site	Item	Sum	3,000	3,000	McCabes Mile River Ltd
Decommission waste recovery infrastructure					
Test sediments in settlement ponds / silt trap	8	No.	250	2,000	Chemtest
Excavate settlement pond sediments	1,000	m ³	5	5,000	NRA Rates
Remove sediments to landfill facility (as cover)	1,000	m ³	40	40,000	Greenstar
Empty hydrocarbon interceptor and tanker off-site (assume 5 tonnes sludge)	Item	Sum	2,000	2,000	Enva
Emptying and cleaning of oil and fuel storage tank (assume 5 tonnes sludge) and transfer of bottom sludge to off-site disposal/ recovery facility	Item	Sum	3,200	3,200	Enva
Removal of oils and lubricants from garage, workshop and external tanks and recovery at off-site facility	10	Tonnes	150	1,500	Rilta
Removal of other (solid / liquid) chemical wastes from laboratory / workshop and disposal or recovery off-site	5	Tonnes	150	750	Rilta
De-silting of wheelwash and disposal of silt at off-site landfill facility (assume 5 tonnes solid waste)	Item	Sum	2,000	2,000	Enva
Emptying of septic tank and disposal of solid waste (10 tonnes) at off-site facility	Item	Sum	1000	1,000	Enva

ACTIVITY	QUANTITY	UNITS	RATE (€)	COST (€)	SOURCE
Re-profile and grade upper surface of in-situ soils to create stable landform and facilitate surface water drainage	120,000	m ²	0.65	78,000	NRA / Landscape Contractors* / McCabes Mile River Ltd
Continued pumping of surface water run-off and dewatered groundwater from part backfilled quarry to settlement ponds / interceptor (upper bound energy consumption of 200,000 kWh/yr for 3 years)	600,000	kWh	0.125c / kWh	75,000	Electric Ireland
Off-site transfer and recovery / disposal of non-inert material	250	m ³	100	25,000	Rilta
Environmental Monitoring of Noise, Dust, Water (Quarterly for 3 year period, incl. closure works)	12	No.	1,500	18,000	SLR IE
24 hour manned security cover (during works and/or following unexpected closure or abandonment)	Month	36	13,500	486,000	TOP Security
Provision of security patrolling vehicle	Month	36	800	28,800	TOP Security
Provision of utilities to security office (light / heat / water)	Month	36	500	18,000	Electric Ireland / Irish Water
Closure Validation Report	Item	Sum	5,000	5,000	SLR IE
Total Site Closure Cost (excl. VAT)				€794,250	
15% Contingency (to address unforeseen issues / liabilities)				119,137.50	
Total Site Closure Cost (excl. VAT)				€913,387.50	

- * O'Brien Landscaping / Redlough Landscapes

3.4 Closure Plan Update and Review

As required by the waste licence conditions, this Closure Plan will be reviewed annually and updated where necessary to take account of any facility or process changes, technology changes and costing changes (inflation). Details of the review will be included in the Annual Environmental Report (AER) submission to the EPA.

3.5 Closure Plan Implementation

Quarry backfilling activity is currently projected to be complete within the life of the existing planning permission (i.e. 20 years). If an average importation rate of 400,000 tonnes / year, is assumed, the expected operational life of the waste recovery facility at Huntstown is 18 years. In reality, the timeline for backfilling the quarry void is very dependent on the availability of inert soil and stone generated by off-site construction activity locally and will be subject to ongoing review and change.

The EPA will be given 2 months notice of any proposed temporary closure or suspension of activities and 6 months notice of the intended final closure date. Notice will be provided in accordance with prevailing guidance and it is anticipated that there will also be ongoing discussions with the EPA in respect of required closure procedures.

3.6 Closure Plan Validation

A validation report (including a Certificate of Completion in respect of the Closure Plan) will be submitted to the Agency within 3 months of completion of the works provided for above.

The validation audit will be undertaken by an independent, external environmental Consultant. The final validation report will include:

- an assessment of how the objectives of the Closure Plan have been achieved;
- final 'as-closed' drawings and photographs of the facility;
- results of short-term environmental monitoring undertaken over the closure works period (note however that provision is made for an extended monitoring period thereafter);
- a Certificate of Completion for the CRAMP.

4.0 FACILITY RESTORATION AND AFTERCARE

4.1 Facility Restoration

The waste recovery activities at Huntstown primarily provide for the backfilling of a large void created by extraction of bedrock at the site using imported inert soil and stone and some in-situ stockpiled soil. Backfilling of the quarry void will facilitate restoration of the North Quarry to natural grassland habitat.

The operational life of the recovery facility is anticipated to be approximately 18-20 years and is ultimately contingent on the availability of inert soil waste from local development projects. On planned completion of the final phase of backfilling, much of the work required to achieve the final closure and restoration of the waste facility will already have been completed. It is expected that the final restoration of the waste recovery areas to natural grassland habitat will be completed within a period of 12 months following closure.

In addition to the closure tasks identified previously, the following works will be undertaken during the restoration and aftercare phase

- Progressive decommissioning of any site infrastructure used solely for waste recovery activities;
- Break up of any dedicated hard standing or paved surfaces using a hydraulic breaker;
- Classification testing of construction and demolition wastes;
- Removal of construction and demolition wastes off-site to appropriate construction and demolition waste recovery facility;
- Final grading of the backfilled materials within the quarry void to create the approved restoration landform / slope;
- On-going water management of surface water run-off;
- Backfilling of settlement ponds and decommissioning of all dedicated on-site drainage infrastructure;
- Topsoiling and seeding of the final landform / slope to facilitate development of natural grassland habitat;
- Additional planting around the infilled quarry void to separate the restored area from continuing concrete and asphalt production activities.
- Attendance by security staff (with a patrolling vehicle) at the facility for the duration of the aftercare works.

Further details on the proposed final earthworks and tree planting are provided below.

4.2 Backfilling / Earthworks / Grass Seeding

The backfilling of the former quarry area will proceed upwards, either continually at varying rates or on an intermittent (campaign) basis, as waste material is generated by local development works. In addition to imported materials, small volumes of soil stockpiled in existing berms around the quarry void will also be used to backfill the former quarry.

The quarry void will be backfilled in several phases working upwards from the existing quarry floor at approximately 38mOD to 39mOD. Final formation levels on completion of the backfilling and restoration works will vary on account of the sloped nature of the restored landform, from approximately 65mOD on the eastern side up to 85mOD on the western side.

During site restoration works, the upper surface of the backfilled materials will be graded so as to ensure surface water run-off falls to sumps at temporary low points within the final worked-out quarry. Water will be pumped from these temporary sumps as and when

required to existing channels and settlement ponds / treatment infrastructure at the original ground surface. Treated effluent will be discharged off-site to a tributary stream of the Ward River.

Temporary access ramps into and out of active backfilling areas will be at a gradient of approximately 1v:10h. Temporary side slopes in soil will be constructed at gradients no greater (steeper) than 1v:1.5h in order to ensure stability. On completion, final gradients across the restored ground surface will be relatively shallow, typically of the order of 1v:8v or less.

Topsoil and subsoil will be imported to the site on a continual basis and will not be used immediately in general backfilling of the worked-out quarry. The topsoil and subsoil will be stockpiled separately pending re-use toward the latter stages of the quarry backfilling works, when the top surface of backfilled ground approaches the finished ground levels envisaged by the restoration scheme.

The licence area will be restored on completion of backfilling operations and will merge better into the surrounding suburban landscape. On attaining the planned final level, the final landform will be graded, rolled and compacted as provided for in the closure plan. Thereafter a cover layer of subsoil and topsoil will be placed and graded across the backfilled site. It is likely that this cover will comprise up to 300mm of topsoil over subsoil, such that total thickness of topsoil and subsoil will be at least 1m.

The upper (ground) surface will then be rolled and seeded with grass in order to promote stability, minimise soil erosion and dust generation and establish a natural grassland habitat. The proposed restoration scheme also envisages that hedgerows will be planted across the restored area in an effort to re-establish some of the former field boundaries which pre-dated the development of a quarry in the area.

It is envisaged that the final restoration works across the waste recovery site will be completed within 9 to 12 months of facility closure and final cessation of waste recovery activities. Following seeding, the restored surface will be inspected at intervals in order to identify areas of bare soil or poorly established vegetation growth. In these areas, additional seeding will be undertaken as necessary to improve vegetation coverage.

In order to ensure that there is no long-term conflict with established / ongoing production activities following completion of restoration works, the restored area will be largely be left as managed grassland and/or natural habitat.

4.3 Aftercare Management

On completion of facility closure and restoration works, provision will also be made for subsequent short-term environmental monitoring of air, surface water and groundwater to confirm that there is no evidence of soil or groundwater contamination. Established in-situ groundwater monitoring wells will be maintained and will continue in service.

It is expected that following the aftercare phase, there should be no constraints on future land use associated with soil or groundwater contamination or on future use of any structures remaining in-situ.

The process of surrendering the waste licence to the EPA will progress following the aftercare period in order to remove the legal encumbrance on title deeds to the restored lands and shared infrastructure areas.

4.3.1 Short-Term Aftercare Management

The restoration aftercare management plan for the Huntstown waste recovery facility will comprise three principal short-term activities:

Environmental Monitoring

As previously stated, short-term environmental monitoring of air, surface water and groundwater (for up to 5 years) will be undertaken by the Licensee to ensure that no surface / groundwater contamination is present / emerging following closure of the waste recovery facility and completion of the restoration works.

Maintenance of Planted Hedgerows

Following establishment of the hedgerow planting, it is envisaged that a programme of established maintenance will be required for a period of up to 24 months after the initial planting. This will be undertaken by a landscaping contractor and will include activities such as weed control, formative pruning and/or removal of deadwood, watering (as and if required) and adjustment of ties and stakes.

Maintenance of Grass Sward

The aftercare of the grass sward will be as per grass supplier's instructions, consistent with the intended creation of a natural grassland habitat within the restored area. Initial maintenance following restoration after each phase of backfilling (principally cutting) will be overseen by the waste facility manager at Huntstown or by other designated Roadstone staff nominated by the manager.

After final restoration works have been completed and the aftercare period has elapsed, the land will be left as a natural grassland habitat.

4.3.2 Long Term Aftercare Management

Given the inert nature of the soil and stone material used to backfill the quarry area and the proposed return of the backfilled areas to natural grassland habitat, it is considered that no long-term aftercare monitoring and maintenance will be required for the waste recovery facility at Huntstown.

4.4 Final Restoration and Aftercare Management Costs

The expected cost, associated with the site restoration and aftercare management, are outlined in Table 3 overleaf.

Table 3
Restoration and Aftercare Costs (based on 5 Year Aftercare Period)

ACTIVITY	QUANTITY	UNITS	RATE (€)	COST (€)	SOURCE
Breaking up of pavement and hard-standing surfaces (using hydraulic breaker),	200	m ³	15	3,000	McCabes Mile River Ltd.
Validation testing to classify C&D waste	20	sample	150	3,000	SLR IE
Transfer C&D waste to off-site recovery facility (incl. haulage)	500	tonne	9	4,500	McCabes Mile River Ltd
5 year environmental monitoring (at quarterly intervals)	20	No.	1,500	30,000	SLR IE
Backfill settlement ponds	5,000	m ³	5	25,000	NRA Rates
Final placement of topsoil (assumed to be previously imported and stockpiled on site) (up to 300mm)	12	ha	9,000	108,000	Landscape Contractors*
Surface water management costs (pumping from temporary sumps to settlement ponds for 1 year)	Item	Sum	36,000	36,000	McCabes Mile River Ltd.
Decommission / remove pumping equipment and flexible pipeline infrastructure (total length 2,000m)	Item	Sum	4,000	4,000	McCabes Mile River Ltd.
Empty interceptor and tanker waste off-site	Item	Sum	1,000	1,000	Enva
Surface preparation, grass seeding, ground repair and spraying	12	ha	6,000	72,000	Landscape Contractors*
Post and wire perimeter fencing (3,600m at €5/m)	3,600	m	5	18,000	Landscape Contractors*
Hedgerow Planting (Ground preparation, supply of plants and planting works)	3,600	m	5	18,000	Landscape Contractors*
24 months establishment maintenance for grassland / hedgerows	2	years	15,000	30,000	Landscape Contractors*
Preparation of Waste Licence Surrender application	Item	Sum	4,000	4,000	SLR IE
Surrender of Waste Licence to EPA	Item	Sum	6,000	6,000	EPA
24 hour manned security cover (during restoration works)	Month	12	13,500	162,000	TOP Security

ACTIVITY	QUANTITY	UNITS	RATE (€)	COST (€)	SOURCE
Provision of security patrolling vehicle	Month	12	800	9,600	TOP Security
Provision of utilities to security office (light / heat / water)	Month	12	500	6,000	ESB / Irish Water
Total Restoration and Aftercare Cost (excl. VAT)				€540,100	
15% Contingency (to address unforeseen issues / liabilities)				81,015	
Total Restoration and Aftercare Cost (excl. VAT)				€621,115	

- O'Brien Landscaping / Redlough Landscapes

4.4.1 Closure Plan Costs

The anticipated cost of the planned facility closure following completion of projected soil intake is **€913,387.50** (present day value and incl 15% contingency), as outlined in Table 2 of this plan. As previously indicated, the plan envisages that the proposed waste recovery facility will achieve a clean closure, such that, following cessation of inert soil waste intake and recovery activities and the subsequent decommissioning / removal of plant and waste infrastructure from the facility, no remaining environmental liabilities will attach to restored areas of the site and/or areas where the principal waste recovery activities are located.

4.4.2 Site Restoration and Aftercare Management Costs

The anticipated costs of the site restoration and aftercare management, outlined in Table 3 of this plan, comes to a total of **€621,115** (present day value and incl. 15% contingency). These costs are based on a projected 5 year aftercare management period, with no provision for long-term aftercare monitoring and maintenance thereafter.

4.5 Financial Provision

Subject to Agency approval and agreement, Roadstone Ltd. will make financial provision for the closure and restoration of the waste recovery facility at Huntstown by lodging an insurance company bond with the Agency, coupled with an agreement which will empower it to apply such security (or part thereof as may be required) to ensure the satisfactory completion of site restoration and aftercare works at Huntstown.

The initial amount of the bond will be agreed with the Agency on the basis of the assessments provided in this plan and will be adjusted as necessary each year thereafter to take account of ongoing review and revisions of the CRAMP.

5.0 REPORT CLOSURE

This report has been prepared by SLR Consulting Ireland (SLR) with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Roadstone Ltd. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

FIGURES

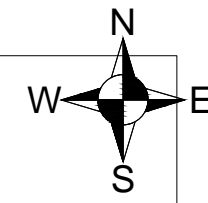
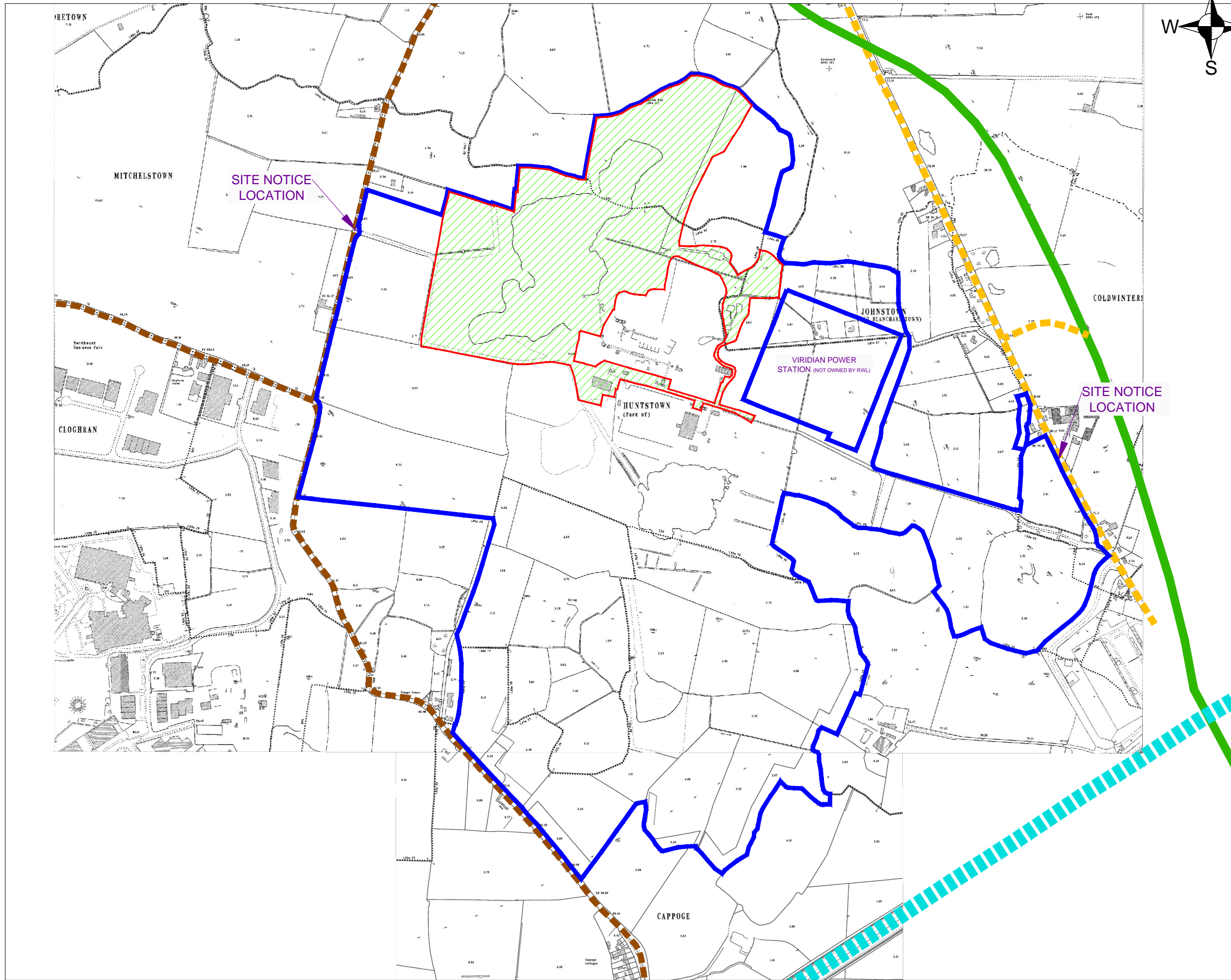
**Figure 1
Site Location Map**

**Figure 2
Existing Site Layout**

**Figure 3
Environmental Monitoring Locations**

**Figure 4
Restoration Proposals**

**Figure 5
Restored Cross Sections**



NOTES

- EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A, 3130-B,
- ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000715 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND

LEGEND

	ROADSTONE LTD. LANDHOLDING (c. 201.8 ha)
	WASTE LICENCE APPLICATION AREA (c. 36.1 ha)
	N2 DUAL CARRIAGEWAY
	NORTH ROAD (R135)
	LOCAL ROAD
	M50 MOTORWAY

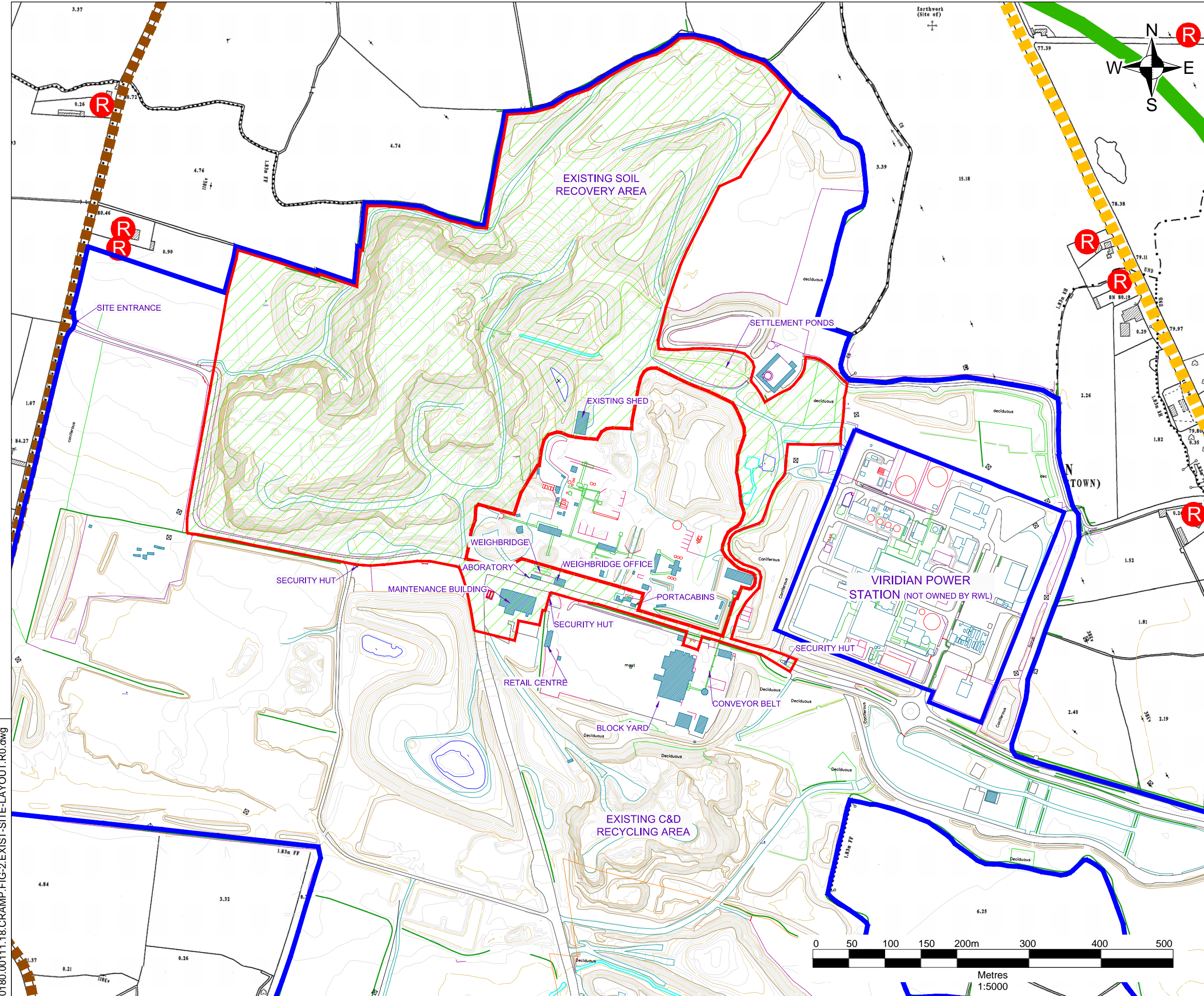
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**ROADSTONE LIMITED
 HUNTSTOWN - CRAMP
 INERT WASTE RECOVERY FACILITY,
 CLOSURE, RESTORATION &
 AFTERCARE MANAGEMENT PLAN
 SITE LOCATION MAP**

FIGURE 1

Scale: 1:10,000 @ A3 Date: MARCH 2015

0180.00111.18.CRAMP.FIG-1.SITE-LOC.R0.dwg



NOTES

1. EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
2. ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000715 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
3. TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

LEGEND

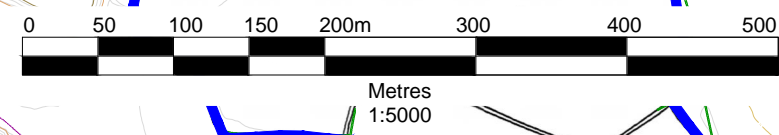
	ROADSTONE LTD. LANDHOLDING (c. 201.8 ha)
	WASTE LICENCE APPLICATION AREA (c. 36.1 ha)
	N2 DUAL CARRIAGEWAY
	NORTH ROAD (R135)
	LOCAL ROAD
	LOCATION OF NEAREST RESIDENCES

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**ROADSTONE LIMITED
 HUNTSTOWN - CRAMP**
 INERT WASTE RECOVERY FACILITY,
 CLOSURE, RESTORATION &
 AFTERCARE MANAGEMENT PLAN
EXISTING SITE LAYOUT

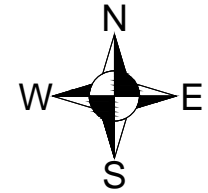
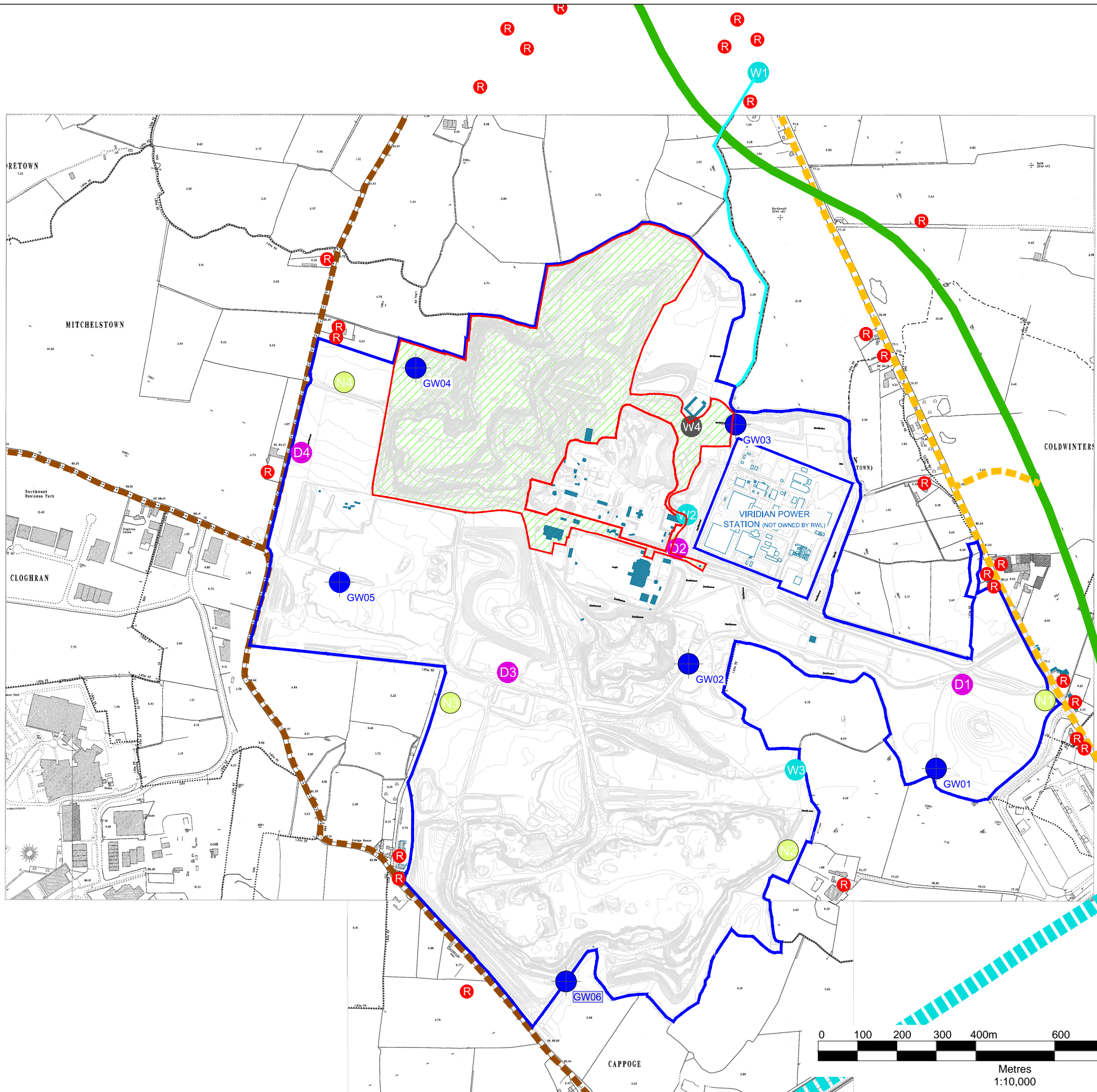
FIGURE 2

Scale 1:5,000 @ A3 Date MARCH 2015



0180.00111.18.CRAMP.FIG-2.EXIST-SITE-LAYOUT.R0.dwg

0180.0011.18.CRAMP.FIG-3.ENVIRO-MONITORING-LOCATIONS.R0.dwg



NOTES

- EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
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- TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

LEGEND

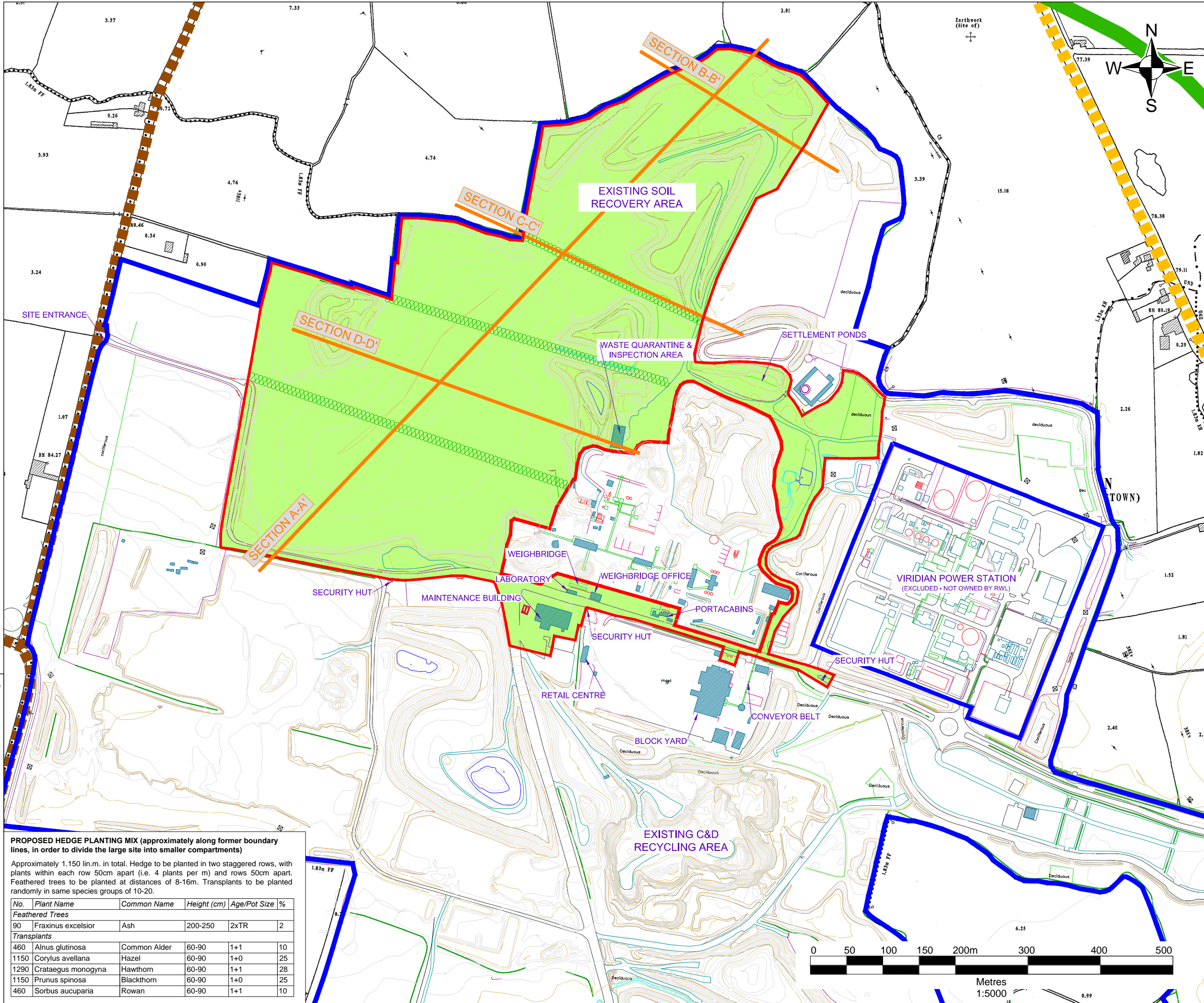
	ROADSTONE LTD. LANDHOLDING (c. 201.8 ha)
	WASTE LICENCE APPLICATION AREA (c. 36.1 ha)
	N2 NATIONAL PRIMARY ROUTE (DUAL CARRIAGEWAY)
	NORTH ROAD (R135)
	LOCAL ACCESS ROAD
	M50 MOTORWAY
	LOCATION OF NEAREST RESIDENCES
	NOISE MONITORING LOCATION
	DUST MONITORING LOCATION
	GROUNDWATER MONITORING WELL LOCATION
	SURFACE WATER MONITORING LOCATION
	PROPOSED SURFACE WATER MONITORING LOCATION

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**ROADSTONE LIMITED
 HUNTSTOWN - CRAMP**
 INERT WASTE RECOVERY FACILITY,
 ENVIRONMENTAL LIABILITY
 RISK ASSESSMENT
**ENVIRONMENTAL MONITORING
 LOCATIONS**

FIGURE 3

Scale: 1:10,000 @ A3 Date: MARCH 2015



- NOTES**
1. EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
 2. ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000715 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
 3. TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

- LEGEND**
- ROADSTONE LTD. LANDHOLDING (c. 201.8 ha)
 - WASTE LICENCE APPLICATION AREA (c. 36.1 ha)
 - N2 DUAL CARRIAGEWAY
 - NORTH ROAD (R135)
 - LOCAL ROAD
 - PROPOSED NATIVE HEDGE PLANTING
 - CROSS SECTION LOCATIONS

PROPOSED HEDGE PLANTING MIX (approximately along former boundary lines, in order to divide the large site into smaller compartments)

Approximately 1.150 lin.m. in total. Hedge to be planted in two staggered rows, with plants within each row 50cm apart (i.e. 4 plants per m) and rows 50cm apart. Feathered trees to be planted at distances of 8-16m. Transplants to be planted randomly in same species groups of 10-20.

No.	Plant Name	Common Name	Height (cm)	Age/Pot Size	%
Feathered Trees					
90	Fraxinus excelsior	Ash	200-250	2xTR	2
Transplants					
460	Alnus glutinosa	Common Alder	60-90	1+1	10
1150	Corylus avellana	Hazel	60-90	1+0	25
1290	Crataegus monogyna	Hawthorn	60-90	1+1	28
1150	Prunus spinosa	Blackthorn	60-90	1+0	25
460	Sorbus aucuparia	Rowan	60-90	1+1	10

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**ROADSTONE LIMITED
HUNTSTOWN - CRAMP**

**INERT WASTE RECOVERY FACILITY,
CLOSURE, RESTORATION &
AFTERCARE MANAGEMENT PLAN**

RESTORATION PROPOSALS

FIGURE 4

Scale 1:5,000 @ A3 Date MARCH 2015

0180.0011.18.CRAMP.FIG-4.PROP-RESTORATION-LAYOUT.R0.dwg

APPENDIX H

Environmental Liabilities Risk Assessment



global environmental solutions

**Huntstown Inert Waste Recovery Facility
North Quarry, Huntstown
Finglas, Dublin 11**

**ENVIRONMENTAL LIABILITY
RISK ASSESSMENT (ELRA)**



August 2015
SLR Ref: 501.00180.00111 ELRA Rev A

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APPENDICES

Appendix A Details of Roadstone Limited Current Insurances	
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EXECUTIVE SUMMARY

Activity Details

Name	Huntstown Soil Recovery Facility
Address	North Quarry, Huntstown, Finglas, Dublin 11
Licence No.	WO277-01
Activities Licensed	<p><i>Class R5 (P):</i> Recycling / reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials (Principal Activity).</p> <p><i>Class R3 :</i> Recycling / reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) which includes gasification and pyrolysis using the components as chemicals.</p> <p><i>Class R13 :</i> Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in Section 5(1)), pending collection, on the site where the waste is produced).</p>

Report Preparation

This Environmental Liability Risk Assessment has been independently prepared on behalf of Roadstone Ltd. by SLR Consulting Ireland, of 7 Dundrum Business Park, Windy Arbour, Dublin 14.

Comparison with Previous Plans

This plan updates a draft Environmental Liability Risk Assessment previously submitted to the EPA by Roadstone Ltd. in September 2013 in support of the its waste licence application. However, no financial provision was formally agreed with the EPA on foot of the draft plan at that time.

Overview of the Plan

This Environmental Liability Risk Assessment has had regard to the requirements outlined in Condition 12 of the Waste Licence and was prepared in accordance with the EPA publication, *Guidance on Assessing and Costing Environmental Liabilities (2014)*.

Cost Summary

As a result of this assessment, and based on a plausible worst case scenario, a requirement for financial provision of **€1,584,300** (including 20% contingency) has been calculated for the waste facility at Huntstown. This amount is deemed to be the maximum liability which could arise from the operation of the facility.

Financial Provision

Arising out of this assessment, Roadstone Ltd. is prepared to make the required financial provision in respect of closure and aftercare costs by means of a financial bond submitted under separate cover to the EPA.

Review

This ELRA will be reviewed annually and updated where necessary to take account of any facility or process changes, technology changes and costing changes (inflation). Details of the review and updates (if any) shall be included in the Annual Environmental Report (AER) submission to the EPA.

1.0 INTRODUCTION AND BACKGROUND

1.1 Huntstown Soil Recovery Facility

The Environmental Protection Agency (hereinafter '*the Agency*' or '*EPA*') issued a waste licence to Roadstone Ltd. (hereinafter '*Roadstone*') in respect of an inert waste recovery facility at Huntstown Quarry, Finglas, Dublin 11 on 11th February 2015 (Ref. W0277-01). The principal waste activity at the site is backfilling an existing quarry void (North Quarry) using imported inert soil and stone. It is anticipated that waste activities will commence in the late spring / early summer of 2015.

The waste licence provides for

- Backfilling of up to 7,295,000 tonnes (approximately 3,840,000m³) of inert material, of which approximately 7,200,000 tonnes must be imported. Inert materials to be placed and recovered at the facility will be sourced from construction and/or demolition sites where testing has indicated that no soil or material contamination is present. The inert material will consist principally of excess soil, stones and/or broken rock excavated on construction sites;
- Separation of any non-inert construction and demolition waste (principally metal, timber, PVC pipes and plastic) unintentionally imported to site prior to removal off-site to appropriately licensed waste disposal or recovery facilities;
- Restoration of the backfilled void (including placement of cover soils and seeding) and return to use as agricultural grassland and
- Environmental monitoring of noise, dust, surface water and groundwater for the duration of the site restoration works and for a short period thereafter.

1.2 Site Description

The licenced inert waste recovery facility is located entirely within the townlands of Huntstown and Kilshane, Co. Dublin, approximately 2.5km north-west of the Dublin suburb of Finglas and 2km north-west of the interchange between the N2 Dual Carriageway and the M50 Motorway. The plan extent of the lands owned by Roadstone Ltd. is outlined in blue on an extract from the Discovery Series map of the area, reproduced as Figure 1.

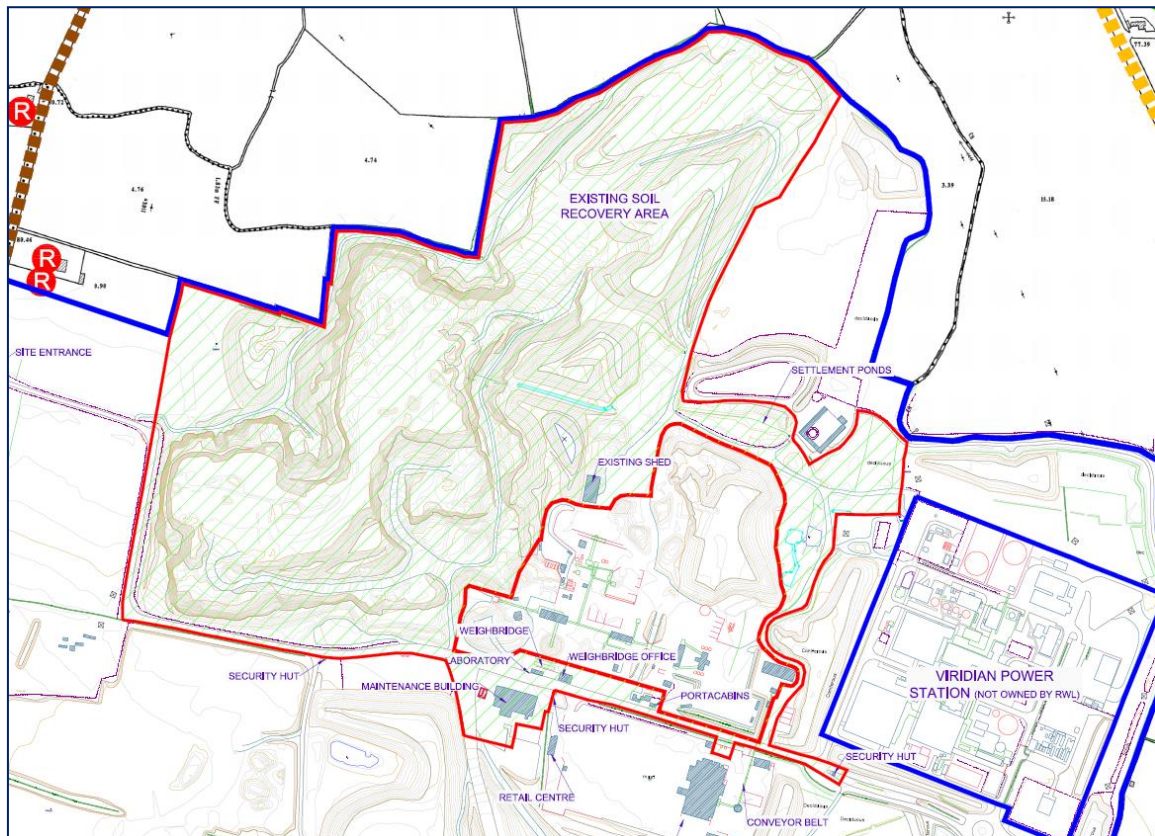
The waste licence facility is located entirely within a large active quarry complex and adjoins concrete and asphalt production facilities operated by Roadstone Ltd. The waste facility covers an area of approximately 36.1 hectares (87.0 acres) and comprises a largely worked-out limestone quarry with perimeter screening / overburden mounds, together with established site infrastructure required to operate the inert waste / soil recovery facility. The existing site layout, together with additional infrastructure required to support waste recovery activities, is shown in Figure 2.

Ground levels across the licensed facility have been significantly disturbed by previous quarrying activities. The original ground levels around the worked-out quarry vary between approximately 62mOD and 66mOD (Malin) along the eastern face and between 80mOD and 85mOD along the western face. Existing ground levels immediately behind the quarry faces are locally 5m to 10m higher than surrounding ground due to the presence of perimeter screening mounds.

Figure 1
Site Location



Figure 2
Waste Recovery Facility : Existing Site Layout



The existing floor level in the quarry lies at approximately 38mOD to 39mOD and its depth from the original (surrounding) ground level therefore varies from 24m to 28m along its eastern face and 42m to 47m along its western face.

Some restoration work was undertaken at the northern end of the licensed site in the period from late 2002 to the end of 2003. At that time, a large volume of inert excavation spoil arising from construction of the Dublin Port Tunnel was imported to site and used to backfill the quarry void in that area. Since that time there has been only minor progress in the site restoration works. The future restoration and backfilling work in this area will proceed in accordance with the terms of the waste licence issued by the Agency.

The existing quarry void covers an area of approximately 11.2 hectares (27.0 acres) within the licensed site area and is shown on Plate 1 below, in an aerial view from Google Earth dated July 2013.

Plate 1
Aerial View of Site from Google Earth (July 2013)



The proposed recovery of inert soils at the North Quarry will provide for complete backfilling of a large open void above the groundwater table, facilitate the restoration of the lands to agricultural use and improve protection to the underlying groundwater resource, which is currently classified as 'extremely vulnerable' due to the absence of any protective soil cover. Plate 2 overleaf shows the quarry void in December 2013.

Plate 2
View of North Quarry Void in December 2013



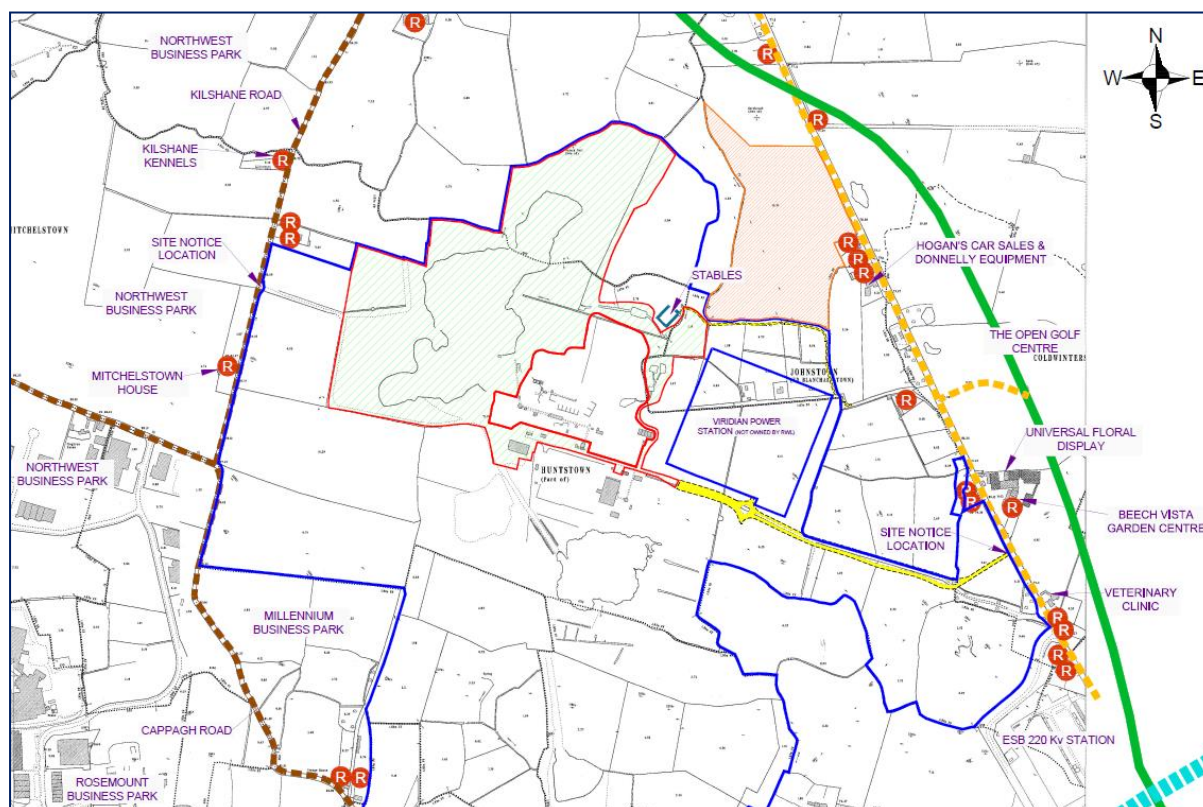
1.3 Surrounding Land Use

The licensed waste site is located entirely within an existing active quarry complex. The land immediately south-east of the backfill and restoration area is used for the processing of aggregates and manufacture of concrete and asphalt products. The lands immediately to the south of the licensed site are currently used, or intended to be used, for aggregate extraction, while the lands to the immediate west, north and north-east of the site are primarily used for agricultural grassland.

Beyond the Roadstone property boundary, the Huntstown Power station (operated by Viridian), North Road and the N2 Dual Carriageway all lie to the east of the licensed site. The M50 motorway and the proposed alignment for the Metro West light rail line both lie to the south, while the lands to the south west and west have been developed as light industry and science and technology parks (Ballycoolin Business Park, Rosemount Business Park, Millennium Business Park and Northwest Business Park). The lands to the north are still used predominantly as agricultural grassland.

Existing land-use in the vicinity of the licensed waste site, including residential, commercial and industrial development, is shown on the land-use map in Figure 3.

Figure 3
Surrounding Land Use



1.4 Classes of Licensed Waste Activities

The waste licence issued to Roadstone by the Environmental Protection Agency (EPA) provides for the following licensed activities (as per the Fourth Schedule of the Waste Management Acts 1996-2014).

- Class R5 (P): Recycling / reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials (Principal Activity).
- Class R3 : Recycling / reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) which includes gasification and pyrolysis using the components as chemicals.
- Class R13 : Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in Section 5(1)), pending collection, on the site where the waste is produced).

1.5 Licence Requirements

This Environmental Liability Risk Assessment (ELRA) is prepared in compliance with Condition 12 of the waste licence for an inert soil waste recovery facility at Huntstown Quarry, Finglas, Dublin 11 (Waste Licence Register Number W0277-01).

12.2 Environmental Liabilities

- 12.2.1 *The licensee shall, as part of the AER provide an annual statement as to the measures taken or adopted at the site in relation to the prevention of environmental damage, and the financial provisions in place in relation to the underwriting of costs for remedial actions following anticipated events (including closure) or accidents / incidents, as may be associated with the carrying on of the activity.*
- 12.2.2 *The licensee shall arrange for the revision, by an independent and appropriate qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA) which addresses the liabilities from past and present activities. The assessment shall include those liabilities and costs identified in Condition 10 for execution of the CRAMP. A report on this assessment shall be submitted to the Agency and agreed in advance of commencement of the activity. The ELRA shall be reviewed and updated as necessary to reflect any significant change on site, and in any case every three years following initial agreement. Review results are to be notified as part of the AER.*
- 12.2.3 *In advance of the commencement of the activity, the licensee shall, to the satisfaction of the Agency, make financial provision to cover any liabilities associated with the operation (including closure, restoration and aftercare) of the facility. The amount of indemnity held shall be reviewed and revised as necessary, but at least annually. Proof of renewal or revision of such financial indemnity shall be included in the annual 'Statement of Measures' report identified in Condition 12.2.1.*
- 12.2.4 *The licensee shall revise the cost of closure, restoration and aftercare annually and any adjustments shall be reflected in the financial provision made under Condition 12.2.3.*
- 12.2.5 *The licensee shall have regard to the Environmental Protection Agency Guidance on Assessing and Costing Environmental Liabilities (2014) and, as appropriate, Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006) when implementing Conditions 12.2.2 and 12.2.3 and 12.2.4 above.*

1.6 Scope of this ELRA

In preparing this plan, regard has been had to requirements outlined in Condition 12.2 of the Waste Licence (reproduced above). This plan identifies and addresses any potential risks to the environment and associated liabilities arising from past and planned future activities at the waste recovery facility at Huntstown.

Planned liabilities associated with the closure of the facility are not considered in this Environmental Liabilities Risk Assessment (ELRA) and have been identified and costed separately in the Closure, Restoration and Aftercare Management Plan (CRAMP) prepared in accordance with the requirements of Condition 10.2 and 10.3 of the waste licence.

2.0 CHARACTERISATION OF LOCAL ENVIRONMENT

2.1 Site Operation

As previously noted, the soil waste recovery facility at Huntstown is located entirely within a working quarry and construction materials production facility operated by Roadstone Ltd. The licensee's waste facility covers an area of approximately 36.1 hectares, with a worked-out rock quarry area of approximately 11.2 hectares and existing site infrastructure on the lands immediately surrounding it.

Some restoration work was undertaken at the northern end of the waste recovery facility in the period from late 2002 to the end of 2003. At that time, a large volume of inert excavation spoil arising from construction of the Dublin Port Tunnel was imported to site and used to backfill the quarry void in that area. Since that time there has been only minor progress in the site restoration works. It is envisaged that future restoration and backfilling work in this area will proceed in accordance with the terms of a waste licence issued by the Agency.

Although the footprint of the licensed waste facility seeks to avoid conflict with other established activities around the quarry void, including concrete, asphalt and block production areas, it includes access roadways and all shared infrastructure required to operate the inert waste / soil recovery facility (including offices, wheelwash, weighbridge, maintenance sheds, hardstand areas etc.)

2.2 Operator Performance

2.2.1 Environmental Management Systems

Roadstone implements an Environmental Management System (EMS) at all its facilities in respect of its core quarrying and construction material production activities. In recent years it has extended the scope of the EMS to encompass inert soil / C&D waste recovery activities. As part of its EMS, Roadstone has developed standard procedures to address waste acceptance and handling activities, as well as an emergency response plan.

2.2.2 Compliance History

Excavation and blasting of limestone has been undertaken at the Huntstown Quarry Complex for the past four decades, following grant of planning permission in or around 1973.

Neither Roadstone Ltd. nor any of its predecessor companies (which includes Roadstone Dublin, Roadstone Provinces and John A. Wood), has ever been convicted of any offence under the Waste Management Acts 1996-2014, the Environmental Protection Agency Act 2003 or the Air Pollution Act 1987.

The Huntstown quarry complex has been operated in compliance with all permits and planning consents and Roadstone has not been subject to any enforcement action by the Local Authority. A number of complaints and warning letters in respect of compliance with planning conditions were received by the company between 2007 and 2010 were subsequently addressed and/or resolved by the company.

2.2.3 Incident History

A fuel leak / spill occurred during filling of diesel tanks in early 2013, overflowed at a downstream interceptor and impacted a lagoon to the south of the central infrastructure area (outside the proposed waste licence area). A specialist contractor was called to site to remove spilled fuel in lagoons or sumps of ponding at the ground surface. It also pumped out the ground around the fuel tank and interceptor outflow pipe.

Subsequent groundwater sampling and testing and a follow up site inspection and audit undertaken by AWN Consulting revealed that, following the site clean-up, there was no evidence of ground, surface water or groundwater contamination by hydrocarbons. A qualitative risk assessment undertaken by AWN also indicated that the spill presented a low risk to groundwater quality directly beneath the site and negligible risk to water supply boreholes, surface water bodies and site based personnel or visitors.

2.2.4 Environmental Monitoring

There is an established programme of environmental monitoring in connection with ongoing rock extraction, aggregate processing and concrete / asphalt production activity across the Huntstown Quarry Complex. This environmental monitoring programme complies with the requirements of existing planning permissions, waste permits and discharge licences issued by Fingal County Council in respect of established activities.

2.3 Environmental Sensitivity

2.3.1 Geology

Topsoil was previously stripped from the site in order to facilitate the development of the North Quarry and is currently stockpiled in mounds across and around the existing quarry site. Soil mapping suggests that the lands surrounding the Huntstown Quarry complex comprise well-drained soils which are suitable for a wide range of agricultural activity, generally grassland or tillage. There is also some poorly drained soil which has more restricted uses, principally seasonal grassland.

Site inspections indicate that the subsoil profile comprises a significant amount of Made Ground (soil disturbed or placed by human activity) over limited thickness of glacial till and/or rock. No evidence of soil contamination was identified at the site.

Most of the Made Ground arises from historical and ongoing extractive activity, principally overburden removal and stockpiling or installation of fixed plant and infrastructure. The effect of this is that few areas of undisturbed soil or subsoil remain across the Huntstown Quarry complex.

The most recent geological map of the local area published by the Geological Survey of Ireland (GSI) indicates that rock around the licensed facility comprises limestones of the Lucan, Feltrim, Malahide and Tober Colleen Formations.

The GSI maps indicate that the geological contact between the Waulsortian Limestones of the Feltrim Limestone Formation and the Tober Colleen Formation is exposed in the roadway leading into the Central Quarry, to the south of the licensed facility and it has identified this feature for future designation as a Natural Heritage Area (NHA) on geomorphological / geological grounds.

2.3.2 Hydrology

The inert soil recovery facility to be located in the North Quarry lies entirely within the Ward River catchment. Rain falling across the licensed facility either

- runs over unsealed ground into the existing quarry void and the pond on the eastern side of the quarry floor;
- percolates down through the existing soil / rock at the ground surface as recharge to groundwater, at which point it joins groundwater flow toward the quarry face;
- collects in surface water drainage infrastructure installed across the central infrastructure area where aggregate processing and concrete production activities are currently concentrated.

Groundwater levels at the North Quarry are lowered by means of sumps in the quarry floor. Surface water falling across the quarry and dewatered groundwater are collected in a sump on the north-western side of the quarry floor and pumped to an existing drainage channel at original ground surface level via an existing pipe network. Water pumped to this channel is routed via existing settlement lagoons to discharge to a tributary stream which runs northwards out of Roadstone's property, toward the Ward River. This discharge is currently regulated by way of a discharge licence issued by Fingal County Council (Ref. WPW/F/008-01).

The northern portion of the Ward River (known as the Ballystrahan sub-catchment) is classified in the latest EPA assessment of Ireland's rivers (for years 2010-2012) as being of 'poor' status. The Ward River has a median quality which is generally deemed to be unsatisfactory. Siltation by agriculture and urban wastewater discharges are likely to be the principal contributors to reduced water quality in the stream.

2.3.3 Hydrogeology

Bedrock aquifer maps indicate that the Huntstown Quarry complex straddles bedrock formations which are generally considered to be locally important karstified aquifers. Of the three bedrock formations exposed at Huntstown, both the Waulsortian and Malahide Formations are classified by the GSI as locally important aquifers, while the Tober Colleen Formation is classified a poor aquifer.

While there is groundwater seepage into the North Quarry, volumes vary seasonally and are typically low to moderate.

Groundwater vulnerability maps published by the EPA on its website (www.epa.ie) indicate that the licensed site is located in an area with high to extreme groundwater vulnerability status where rock is close to the surface. Groundwater vulnerability reflects the potential for rapid groundwater movement through subsoil deposits into the underlying bedrock aquifer. It is generally high or extreme where subsoil deposits are thin or absent and provide little or no attenuation for potential pollutants or contaminants.

Recent groundwater sampling and testing indicate that groundwater quality at the site is generally good, with established on-site activities shown to have had no significant impact on existing groundwater quality.

2.3.4 Sensitive Receptors

The principal sensitive receptors in the vicinity of the licensed facility comprise a number of private residential properties along the western property boundary, along Kilshane Road. For the purposes of this risk assessment, site users, operatives and visitors are also considered as receptors.

The receptor locations considered for ecological exposure are those which might be adversely affected by any form of environmental emission. For the purposes of assessment, the most sensitive ecological receptor is deemed to be the locally important aquifers beneath the site. Other receptors could include the tributary to the Ward River. There are no designated nature conservation sites within 2km radius of the licensed facility.

2.3.5 Pathways

The only surface water emission / monitoring point at the licensed facility is the discharge point downstream of the settlement ponds and hydrocarbon interceptor located to the east of the North Quarry. All surface water run-off across the licensed facility is collected and passed through existing settlement ponds and drainage infrastructure prior to its ultimate discharge to the Ballystrahan stream, a tributary of the Ward River. The quality of this run-off can be adversely impacted if it comes into contact with loose sediment, hazardous materials or contaminated ground. Water quality is a key indicator of environmental performance and

as such, the surface water management infrastructure is a critical environmental pathway for the licensed facility.

As noted previously, some rainfall across the licensed site percolates down through the existing unsaturated zone (in soil / rock close to the ground surface) and recharges to the underlying locally important aquifer. In the event that some contamination of near-surface soil or ground occurs, this recharge can introduce contaminants to the groundwater body and have an adverse impact on its quality and resource potential. As such, groundwater recharge through the ground is another critical environmental pathway for the licensed facility.

Potential noise and dust emissions from the waste recovery facility may be generated by HGV truck movements and by earthworks equipment (bulldozer) engaged in haulage and backfilling activities. There are no fixed (point) noise or dust emission sources at the facility. Air borne emissions of dust and noise transmission from the waste recovery facility have the potential to impact on the occupants of the nearest residential properties.

3.0 RISK ASSESSMENT

3.1 Introduction

The methodology for undertaking the Environmental Liability Risk Assessment (ELRA) in respect of the soil recovery facility at Huntstown comprises a number of discrete elements as outlined below:

- (i) Risk Identification : A list of plausible risks for the waste activity is prepared, including all potential impacts on surface water, groundwater, atmosphere, land, human health, natural habitats and protected species;
- (ii) Risk Analysis : The risk analysis stage comprises establishment of risk classification criteria, followed by a risk analysis based on the selected criteria. Risk classification tables are used in order to evaluate and rank the risks relative to each other.
- (iii) Risk Evaluation : The risk evaluation stage is used to assist in making decisions, using the outcomes of the risk analysis, in identifying and prioritising the identified risks for development of measures to minimise potential environmental impacts.
- (iv) Risk Treatment: The risk treatment stage comprises identification and prioritisation of management and mitigation measures to reduce the risks identified in the risk evaluation process.

3.2 Risk Identification

Risks associated with the operation of the waste recovery facility were identified on foot of site visits and inspections by personnel from SLR Consulting Ireland undertaken in prior to February 2011 and more recently in November 2013. On these occasions, personnel met site management to review the potential environmental hazards and related environmental management issues arising at the site.

The waste handling processes to be undertaken at the waste recovery facility will inevitably generate noise and dust at and across the licensed area.

Normal site operations, undertaken in accordance with procedures contained in the established on-site Environmental Management System (EMS), are not expected to generate any leachate or effluent, as all wastes imported, handled and placed and recovered at the facility will be inert. The Licensee is required to actively monitor and manage incoming wastes to confirm that only inert materials are accepted at the facility. Notwithstanding this, there is potential for discovery of non-inert or potentially hazardous materials, hidden within incoming loads of inert compliant waste.

The on-site storage of fuels / hydrocarbons in mobile and/or static tanks, principally the existing 40,000 litre road diesel tank and 53,000 litre marked diesel (gasoline) tank, is a potential hazard. The on-site storage of hazardous substances used in the operation and maintenance of plant and equipment (including hydraulic oil, transmission fluid, hydrocarbon fluids and gels) at the maintenance shed, as well as the storage of waste oils in the shed, is another potential hazard.

A leak from fuel tanks or pipelines, or spillage of hazardous substances, were they to arise, would most likely run-off over ground and if unimpeded, would either discharge to ground or flow overground and be picked up by surface water drainage infrastructure. Failure to contain such leaks and spills could result in contamination of the groundwater beneath the site and possibly some off-site discharge of contaminated run-off, with the Licensee responsible for clean-up costs in this scenario.

All potential risks of environmental incidents or accidents are summarised in Table 3-1 below.

**Table 3-1
Potential Risks Identified for Recovery Activity**

Risk ID	Process	Potential Risk
1	Stockpiling or Placement of Imported Non-Inert Materials	Excessive dust emissions from stockpiles, placed materials and site activities
2		Excessive noise emissions from site activities
3		Stockpiling or placement of non-inert non-compliant waste; contamination of ground or groundwater / surface water
4	Fuel Storage and Handling	Leaks from pipelines; discharges to ground and groundwater / surface water
5		Spill of stored hydrocarbons; discharges to ground and groundwater / surface water
6	Storage and Handling of Hazardous Materials	Spill or leak of hazardous materials stored on site (gas-oil, hydraulic oil, engine oil, transmission oil, waste oil etc.); discharges to ground and groundwater / surface water
7	Leakages from Mobile Plant and Equipment	Spillage or leakage of fuel from HGVs, tipper trucks, bulldozers and other mobile site equipment; discharges to ground and groundwater / surface water
8	Weather	Flooding on site causing uncontrolled discharge

3.3 Risk Analysis

A list of plausible risks has been identified, which include abnormal but possible and plausible incidents occurring that could give rise to environmental liabilities. The risk analysis is based on the following likelihood and consequence risk classification tables, as outlined in Table 3.2 and Table 3.3 below. The risks identified are tabulated in Table 3.4 and assessed in terms of likelihood and consequence using the risk classification tables.

**Table 3-2
Risk Classification Table – Likelihood**

RATING	LIKELIHOOD	
	Category	Description
1	Very Low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very High	Very high chance of hazard occurring

**Table 3-3
Risk Classification Table – Consequence**

RATING	LIKELIHOOD	
	Category	Description
1	Trivial	No impact or negligible change to the environment
2	Minor	Minor impact / localised or nuisance
3	Moderate	Moderate impact to environment
4	Major	Severe impact to environment
5	Massive	Massive impact to a large area, irreversible in medium term

**Table 3-4
Risk Analysis**

Risk ID	Process	Potential Risks	Environmental Effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
1	Stockpiling or placement of imported non-inert materials	Dust generation from stockpiles or placed materials	Reduction in air quality; inhalation of dust particles Potential health or nuisance impact	3	Slight increase in dust inhalation, principally by site users. Prolonged increase potentially damaging to health	2	Impact attenuated by separation distance, dust suppression, intervening vegetation and frequent seasonal rainfall. Standard dust suppression mitigation measures will ensure no reduction in air quality	6
2	Stockpiling or placement of imported non-inert materials	Noise generation by moving plant and equipment	Increase in ambient noise on site and at nearby properties Potential health or nuisance impact	3	Existing raised ambient noise level. Slight increase in noise exposure, principally for site users. Prolonged increase potentially damaging to health	2	Noise impact attenuated by separation distance and measures to limit emissions at source or screen over intervening distance.	6
3	Stockpiling or placement of imported non-inert materials	Contamination from non-inert non-compliant waste	Potential contamination of ground or locally important aquifer. Potential contamination of surface water.	3	Finite volume of contaminated materials. Placed materials surrounded by low permeability clay.	2	Licensee applies measures to ensure all waste accepted at facility is inert, including establishing origin of incoming wastes Interceptor and silt trap installed	6

Risk ID	Process	Potential Risks	Environmental Effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
4	Fuel Storage and Handling	Leaks from pipelines; discharge to ground or groundwater / surface water	Potential contamination of ground or locally important aquifer. Potential contamination of surface water.	4	Potential for large volume loss.	2	Plant and equipment regularly maintained and inspected. Interceptor and silt trap installed. Pipelines regularly inspected and tested.	8
5	Fuel Storage and Handling	Spill of hydrocarbons stored on site in fuel tanks / drums to ground or groundwater / surface water	Potential contamination of ground or locally important aquifer. Potential contamination of surface water.	4	Potential for large volume loss.	2	Plant and equipment regularly maintained and inspected. Interceptor and silt trap installed. Static tanks are fully bunded. Tanks and containment bunds regularly inspected and tested.	8
6	Storage and Handling of Hazardous Materials	Spill or leak of hazardous materials stored on site (gas-oil, hydraulic oil, engine oil, waste oil etc.); discharge to ground and groundwater / surface water	Potential contamination of ground or locally important aquifer. Potential contamination of surface water.	4	Loss of hazardous and persistent material. Finite volumes stored.	2	Materials stored in maintenance shed. Storage containers and drums placed on bunded pallets. Tanks, drums and pallets regularly inspected and tested. Interceptor and silt trap installed.	8
7	Traffic	Spillage or leakage of fuel from HGVs, trucks and mobile site equipment. Spillage during refuelling discharge to ground and groundwater / surface water.	Potential contamination of ground or locally important aquifer. Potential contamination of surface water.	3	Losses finite (low volume) and dispersed.	2	Plant and equipment regularly maintained and inspected. Interceptor and silt trap installed. Pipelines regularly inspected and tested.	6

Risk ID	Process	Potential Risks	Environmental Effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
8	Weather	Flooding on site causing uncontrolled discharge	Potential contamination of ground or locally important aquifer. Potential contamination of surface water.	3	Potential for large volume loss and impact due to elevated suspended solids	1	No history of flooding at the site. The OPW has a record of one historic flood event in the vicinity of Huntstown, at Kilshane Cross in November 2002. This flood was attributed to 'runoff from adjacent grasslands', and was not related to quarrying activities at Huntstown.	3

3.4 Risk Evaluation

The environmental risks identified above are re-tabulated below in Table 3-5 to assist in the prioritisation for risk treatment purposes

**Table 3-5
Risk Evaluation Table**

Risk ID	Process	Potential Risks	Consequence Rating	Likelihood Rating	Risk Score (Consequence x Likelihood)
4	Fuel Storage and Handling	Leaks from pipelines; discharge to ground and groundwater / surface water	4	2	8
5	Fuel Storage and Handling	Spill of hydrocarbons stored on site in fuel tanks to ground and groundwater / surface water	4	2	8
6	Storage and Handling of Hazardous Materials	Spill or leak of hazardous materials stored on site (gas-oil, hydraulic oil, engine oil, transmission oil, waste oil etc.), discharge to ground and groundwater / surface water	4	2	8
1	Stockpiling or placement of imported non-inert materials	Dust generation from stockpiles or placed materials	3	2	6
2	Stockpiling or placement of imported non-inert materials	Noise generation by moving plant and equipment	3	2	6
3	Stockpiling or placement of imported non-inert materials	Contamination of ground or groundwater by non-inert non-compliant waste	3	2	6
7	Traffic	Spillage or leakage of fuel from HGVs, tipper trucks, bulldozers and other mobile site equipment, Spillage during refuelling discharge to groundwater / surface water.	3	2	6
8	Weather	Flooding on site causing uncontrolled discharge	3	1	3

The risk matrix is displayed in Table 3-6 below. In line with the EPA Guidance, the risks have been colour coded in the matrix to provide a broad indication of the critical nature of each risk to facilitate prioritisation of risks for treatment. The matrix allows risks to be easily displayed and prioritised.

**Table 3-6
Risk Matrix**

Likelihood	Very High	5					
	High	4					
	Medium	3					
	Low	2			1, 2, 3, 7	4, 5, 6	
	Very Low	1			8		
			Trivial	Minor	Moderate	Major	Massive
			1	2	3	4	5
Consequence							

The risk matrix indicates that the bulk of the identified risks lie in the green zone, indicating the need for continuing awareness and regular ongoing monitoring. Three of the risks lie within the amber zone, requiring treatment through mitigation or management action. These are ID4 – Leaks from pipelines, ID 5 – Spill of hydrocarbon stored on site at static and mobile fuel tanks and ID 6 – Spill or leak of hazardous materials stored on site.

3.5 Risk Treatment

The output of the risk treatment process is the development of a statement of measures to be taken to minimise the environmental risk of the activity. The risk reduction due to existing mitigation measures is indicated in Table 3.7.

Table 3.7 allocates identified mitigation measures to a ‘risk owner’. Roadstone will maintain and update a version of this table to inform its Risk Reduction Programme for the recovery facility. The responsibility may differ from that indicated below, depending on the staffing complement and activities / outputs from the adjoining quarry operations.

The Risk Reduction Programme is a dynamic process that will be regularly reviewed and updated to reflect changes that occur at the facility. New risks may emerge with new processes or new methods of working. Additional hazards can arise from the use of new materials for maintenance or fuelling at the facility. Additional mitigation measures can become available or better techniques developed. The staff structure can change and new responsibilities allocated to the site management team.

Table 3-7
Risk Reduction due to Existing Mitigation Measures

Risk ID	Potential Risk	Risk Score	Mitigation Measures to be Taken	Outcome	Action	Date for Completion	Owner / Contact Person
4	Leaks from pipelines; discharge to ground and groundwater / surface water	8	<p>Spill kits comprising containment booms and absorbent materials readily accessible on site.</p> <p>Regular visual inspection and integrity testing of mobile plant and equipment undertaken to identify small or undetected leaks</p>	Reduced likelihood of leaks to ground or groundwater / surface water	Ongoing inspection and monitoring	Ongoing	Location Manager
5	Spill of hydrocarbons stored on site in fuel tanks ; discharge to ground and groundwater / surface water	8	<p>Regular tank and bund integrity assessments undertaken. Tank and bund are visually inspected annually. Bund integrity test undertaken every three years.</p> <p>Bunded fuel tanks are separated from traffic by large tyres to protect bunds from mobile plant.</p> <p>Level alarm installed in storage tank.</p> <p>Fuel storage drums and containers to be inspected at least quarterly</p> <p>Re-fuelling to take place over concrete paved surfaces (including adjacent to fuel storage tank)</p> <p>Sub-surface drainage at these areas and existing downstream treatment infrastructure (interceptor) reduce the scale and impact of a potential fuel leak or spill</p> <p>Spill kits available in workshop for the purpose of containing minor leaks or spills</p> <p>Emergency Response Procedures and Plans are in place detailing the actions should a major leak or spillage event occur.</p>	Reduced likelihood of spills to ground or groundwater / surface water	Ongoing inspection and monitoring	Ongoing	Location Manager

Risk ID	Potential Risk	Risk Score	Mitigation Measures to be Taken	Outcome	Action	Date for Completion	Owner / Contact Person
6	Spill or leak of hazardous materials stored on site	8	<p>All hazardous fluids and materials are stored at the on-site maintenance garage in accordance with regulations until they are either recovered (treated) or disposed of at an appropriate off site waste management facility.</p> <p>All tanks, drums and containers will be subject to routine inspection and maintenance as part of scheduled site Inspections (at least quarterly).</p> <p>Hydraulic oil, transmission fluid and hydrocarbon fluids and gels etc. to be stored on bunded pallets in workshop with concrete floor to prevent infiltration to ground if materials spill.</p> <p>Material Safety Data Sheets are held for all hazardous liquids stored on site. Spill kits available in workshop for the purpose of containing minor spills.</p> <p>Emergency Response Procedures and Plans are in place detailing the actions should a spillage event occur. Emergency Response Training is carried out as part of Environmental Awareness Training for all members of staff.</p> <p>Material storage procedure in place and integrated into Environmental Awareness Training outlines how hazardous materials are to be stored to prevent environmental pollution.</p> <p>Site inspection checklist calls up checks on spill containment measures, content of spill kits, hazardous materials storage, bunds, spill trays, surface water infrastructure, hydrocarbon interceptor, etc.</p>	Reduced likelihood of spills to ground or groundwater / surface water	Ongoing inspection and monitoring	Ongoing	Location Manager

Risk ID	Potential Risk	Risk Score	Mitigation Measures to be Taken	Outcome	Action	Date for Completion	Owner / Contact Person
1	Dust generation from stockpiles or placed materials	6	<p>Employees and visitors are issued with dust masks, if warranted.</p> <p>Surfaces damped down during prolonged dry spells to keep yards and roads dust free.</p> <p>Wheelwash / vehicle wash provided at exit from facility maintained in working order.</p> <p>All traffic movements after the wheelwash will be over paved surfaces to minimise mud pick-up.</p>	Reduced likelihood of excessive dust emissions	Ongoing inspection and monitoring	Ongoing	Location Manager / Waste Facility Manager
2	Noise generation by moving plant and equipment	6	<p>Employees and visitors are issued with ear protectors, if warranted.</p> <p>Where monitoring indicates that noise emissions from the facility are excessive, the Licensee will employ further mitigation in the form of improved working practices, noise screening and/or reduced sound output from (or improved performance of) plant and machinery.</p>	Reduced likelihood of excessive noise emissions.	Ongoing inspection and monitoring	Ongoing	Location Manager / Waste Facility Manager
3	Contamination from non-inert non-compliant waste	6	<p>Licensee designs and implements robust waste acceptance procedures which ensure that all wastes accepted at the recovery facility are inert.</p> <p>Licensee confirms customer's business activities and credentials prior to issuing authorisation to deliver waste to facility</p> <p>Licensee will also establish site of origin and its development history for each waste consignment accepted at the facility.</p>	Reduced likelihood of contaminated waste import	Ongoing inspection and monitoring	Ongoing	Location Manager / Waste Facility Manager

Risk ID	Potential Risk	Risk Score	Mitigation Measures to be Taken	Outcome	Action	Date for Completion	Owner / Contact Person
7	Spillage or leakage of fuel from HGVs, tipper trucks, bulldozers and other mobile site equipment.	6	Re-fuelling to take place over concrete paved surfaces (including adjacent to fuel storage tank) Sub-surface drainage at these areas and existing downstream treatment infrastructure (interceptor) reduce the scale and impact of a potential fuel leak or spill.	Reduced likelihood of spills to ground or groundwater / surface water	Ongoing inspection and monitoring	Ongoing	Location Manager / Waste Facility Manager
7	Spillage during refuelling; discharge to ground and groundwater / surface water.	6	Large tyres have been placed around the fuel tanks to prevent mobile plant from colliding into / impacting with it. Spill kits comprising containment booms and absorbent materials readily accessible on site. Regular visual inspection and integrity testing of mobile plant and equipment undertaken to identify small or undetected leaks	Reduced likelihood of spills to ground or groundwater / surface water	Ongoing inspection and monitoring	Ongoing	Location Manager / Waste Facility Manager
8	Flooding on site causing uncontrolled discharge	3	Monitoring of extreme weather events. Revise emergency response procedures as required.	Increased awareness of response procedures and reduced impact.	Revision of emergency response procedures.	Ongoing	Location Manager / Waste Facility Manager

4.0 IDENTIFICATION OF PLAUSIBLE WORST CASE SCENARIO

The ELRA for the waste recovery activity at Huntstown has identified a small number of risks with a major consequence and these formed the basis of further assessment to identify the plausible worst case scenario.

This assessment determined that the most plausible worst-case environmental scenarios relate to the spill / leak of hydrocarbons stored on site in fuel tanks impacting on groundwater and surface water (ID 4 and ID 5) and spillage / leakage of hazardous materials stored on site that could also impact on groundwater and surface water (ID 6).

Under the worst case scenario, it is assumed that existing / proposed mitigation measures are either:

- (a) not in place, or
- (b) in place, but are either not implemented or fail to function as intended.

If this scenario was to transpire, it is considered that it would not precipitate any other environmental incidents, nor would it increase the likelihood that any other identifiable environmental risks would occur.

It is noted that given the nature of the wastes being handled and the location and configuration of office and existing storage facilities on site, the risks associated with a fire outbreak are considered to be minimal. Risk of injury or death to employees or the public as a result of a fire would be covered by Employer's Liability and Public Liability insurance cover. Any fire affecting plant / equipment or the office would be covered by general insurance.

It is considered that any potential injuries or illnesses caused to site employees or the public by dust or noise emissions would be covered under Employer's Liability and Public Liability insurance cover. The risk of occurrence of these problems is considered very low, provided mitigation measures outlined above are fully implemented.

5.0 QUANTIFICATION AND COSTING

This assessment determined that the most plausible worst-case environmental scenarios relate to the spillage / leakage of hydrocarbons (ID 4 and ID 5) and/or hazardous materials (ID 6) stored on site that could impact on groundwater and surface water. Given the potential for a large volume loss, it is considered that loss of fuel from a filled fuel storage tank (ID 5) presents the greatest level of environmental risk for the waste recovery activity.

The plausible worst case scenario with the highest cost (Risk ID 5) is quantified and costed in this Section and in particular, in Table 5-1 below. For the purposes of this exercise, it is assumed that failure of the largest tank occurs when full. This is a 53,000 litre fuel tank holding diesel (gasoil). As the area around the fuel storage is generally paved and in good condition, it is considered that **at least** 80% of the fuel release would run over ground, as the paved surface would largely impede any percolation or recharge to groundwater. Although it is likely that a higher proportion could run-off over the ground surface to the surface water drainage network / system, it is considered prudent in costing up a worst case scenario to recognise that there could also be some infiltration to ground via unpaved ground (hardstanding) surrounding this area and to incorporate some financial provision for remediation of ground and/or groundwater contamination. Coupled with this, it is conservatively assumed that 100% of the released fuel is discharged to on-site drainage systems and/or surface waters

It is further assumed, for costing purposes that under this scenario, up to 50% of the spilled hydrocarbons would be discharged off-site past the existing discharge point to the Ballystrahan Stream. This stream merges with the Ward River over 5km to the north-east of the discharge point. As previously noted, the Ward River (Ballystrahan sub-catchment) is currently classified as being at 'Poor Status'. Siltation by agriculture and urban wastewater discharges are believed to be the principal contributors to reduced water quality in the river.

The Ward River eventually discharges at the Malahide Estuary, a further 7.5km downstream, a designated Special Area of Conservation (SAC) and Special Protection Area (SPA). The transitional waters of this estuary are currently classified as 'Potentially Eutrophic' principally on account of agricultural and industrial / wastewater discharges.

In view of the significant separation distance (12.5km) between the SAC / SPA and the licensed area, the volume of potential fuel discharge off-site (relative to overall quarry discharge volume and baseline flow) and the current 'Poor' status of both the Ward River and Malahide Estuary, it is considered unlikely that the SAC / SPA will be impacted by any spillage originating at the licensed area. For the purposes of this CSM therefore, the SAC / SPA is not identified as a receptor.

The area surrounding the licensed area is served by Local Authority mains water supply. There is no known abstraction of potable water (for human consumption) from the Ballystrahan Stream. There is also unlikely to be any from the Ward River, given its current 'Poor Status' classification.

In the event that the worst case scenario was to transpire, the associated land and groundwater remediation costs which are likely to be incurred are identified, quantified and costed in Table 5-1 in order to establish an appropriate level of financial provisioning to be made in respect of the recovery facility.

The remediation response to a large fuel spill is likely to comprise the following:

- (i) mobilisation of emergency response contractor to site for immediate spill containment and site clean-up;

- (ii) collection and removal off-site (as contaminated waste) of captured fuels, absorbent materials, impacted soils and contaminated surface waters (from settlement lagoons), all of which are assumed to be hazardous;
- (iii) construction of a temporary bunded facility to store any excavated materials prior to removal off-site;
- (iv) the cost of ground investigation to delineate the extent of the area affected by the spill;
- (v) the cost of constructing and commissioning any abstraction well(s) into the bedrock;
- (vi) installation and commissioning of an on-site treatment system to pump contaminated groundwater out of ground and pass it through oil interceptor and carbon filter and discharge back to ground;
- (vii) maintenance costs for product recovery system, to include consultancy costs, regular daily visits, laboratory analyses, emptying and disposal of recovered products, changing and disposal of carbon filter material.
- (viii) provision for placement of booms across the Ballystrahan Stream for an extended period, river bank clean up, restocking, remediation / replanting and any consequential losses to cattle.

The cost of excavating and removing / remediating contaminated soil or groundwater material is very much dependent on the volume and degree / nature of any contamination which might occur or be encountered.

As a worst-case scenario, we have accordingly recommended provision of **€1,584,300** for remediation / evacuation of contaminated groundwater in the event of a large scale fuel spillage (inclusive of 20% contingency). It should however be recognised that following implementation of all mitigation measures (principally provision of a bunded containment area), the probability of such an occurrence materialising is considered low.

Table 5-1
Quantification and Costing of Plausible Worst Case Scenario

Task	Description	Quantity (No.)	Measurement Unit	Unit Rate (€)	Cost (€)	Source of Unit Rates
Response to: Risk ID 5 Spill of gasoil stored from on-site 53,000L fuel tanks	Mobilising emergency response contractor to site for spill containment and site clean-up	5	Days	3,750	18,750	Enva / Verde / Rilta
	Trial pits	20	No.	150	3,000	SLR Consulting Ireland
	Soil quality testing (incl. leachate tests)	50	Sample	150	7,500	Jones Environmental Laboratory
	Drill and install groundwater monitoring wells around affected area to average depth of 30m	8	No.	1000	8,000	Causeway Geotech Ltd
	Purging and sampling of wells over five years, with following frequencies: Year 1 –monthly : Year 2 – bimonthly Years 3-5 - quarterly	30	Visit	1,000	30,000	SLR Consulting Ireland
	Testing of groundwater samples (8 No.) from wells over 30 rounds	240	Sample	150	36,000	Jones Environmental Laboratory
	Construction of temporary lined contaminated soil holding area	1,000	m ³	50	50,000	SLR Consulting Ireland
	Excavation of contaminated soil	3,000	Tonne	5	15,000	EPA Unit Cost guidance (upper bound)
	Removal and disposal off site (as hazardous waste) of up to 3,000 tonnes of contaminated soil, interceptor sludge, captured fuel and absorbent materials	3,000	Tonne	150	450,000	Rilta / EPA Unit Cost Guidance (upper bound)
	Transport of contaminated soil of up to 2,500 tonnes of contaminated soil, captured fuel and absorbent materials	3,000	Tonne	15	45,000	Rilta

Task	Description	Quantity (No.)	Measurement Unit	Unit Rate (€)	Cost (€)	Source of Unit Rates
Response to: Risk ID 5 Spill of gasoil stored from on-site 53,000L fuel tanks	Excavation of on-site materials from bunds on site and placement of uncontaminated soil to backfill excavated voids	3,000	Tonne	8	24,000	NRA Rates Database
	Removal and treatment of captured fuel / waters at settlement ponds upstream of discharge point	600	m ³	150	90,000	Rilta / EPA Unit Cost Guidance (upper bound)
	Drain Jetting / CCTV survey	500	m	5	2,500	USSR / Boyne Waste/EPA Guidance
	Installation, operation and maintenance of booms at stream over extended period	1	Year	100,000	100,000	Regenesis Remediation SLR Consulting – estimate based on previous experience
	Allowance for remedy of any consequential losses arising from impact to stream (eg ecological survey, restocking, river bank clean-up / remediation / replanting, compensate for livestock impact)	1	Unit	200,000	200,000	SLR Consulting - estimate based on previous experience of fuel discharge to river
	Inspection and testing of river daily for one week following spill and as follows: - Weekly for 11 weeks - Monthly for 9 months - Biannually for 4 years	33	Visit	500	16,500	SLR Consulting
	Installation, operation and maintenance of pump and treat system for groundwater contamination	1	Year	200,000	200,000	Regenesis Remediation costs
	Environmental Consultancy Costs (reporting, supervision and surrender application)	40	Days	600	24,000	SLR Consulting Ireland
Total (€)					€1,320,250	
20%Contingency					264,050	
Final Total (€)					€1,584,300	

6.0 CONCLUSIONS

6.1 Environmental Liabilities

An Environmental Liabilities Risk Assessment has been carried out for the planned soil waste recovery facility at Huntstown Quarry, Dublin 11. The ELRA has been prepared in accordance with the EPA publication *Guidance on Assessing and Costing Environmental Liabilities (2014)*.

Fuel / hazardous materials storage and handling (Risk ID 4, ID 5 and ID6) have been identified as the highest environmental risks at the Huntstown soil waste recovery facility. Due to the potential for large volume loss for Risk ID5, it is assumed for the purposes of assessing potential environmental liability that the worst case scenario would involve a leak or spill from the existing 53,000 litre fuel storage tank with potentially major consequences for surface water quality in the adjoining Ward River catchment and/or underlying groundwater aquifer.

If this scenario was to transpire, it is considered that it would not precipitate any other environmental incidents, nor would it increase the likelihood that any other identifiable environmental risks would occur.

The environmental liability has been assessed on the basis of the worst case scenario outlined above. Were it to materialise, the maximum environmental liability which could be incurred is estimated to be of the order of **€1,584,300** (inclusive of 20% contingency)

6.2 Financial Provision for Environmental Liabilities

Roadstone Ltd. has the following insurance cover in place by way of provisioning for potential environmental liabilities in respect of the planned waste recovery facility at Huntstown;

- (i) Employers Liability Insurance – indemnified for up to €22.7 million.
- (ii) Public Liability Insurance – indemnified for up to €13 million.

Details of Roadstone's current employers liability insurance and public liability insurance are provided in Appendix A.

Should the Agency raise any concerns in respect of any clauses or provisions of these insurances (such as limits on cover, policy exclusions or deductibles), Roadstone will endeavour to modify the policy terms to satisfy the Agency's specific requirements in respect of provision for potential environmental liabilities (provided it is practicable and cost effective to do so).

Roadstone will make the financial provision necessary to cover the amount of the assessed environmental liability by lodging an insurance company bond with the Agency, coupled with an agreement which will empower it to apply such security (or part thereof as may be required) in the event that a liability event materialises at the waste recovery facility at Huntstown.

The initial amount of the bond will be agreed with the Agency and adjusted as necessary each year thereafter to take account of ongoing review and revisions of the CRAMP.

7.0 CLOSURE

This report has been prepared by SLR Consulting Ireland (SLR) with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the Client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Roadstone Ltd; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

APPENDIX A

Details of Roadstone Limited Current Insurances



XL Group
Insurance
Reinsurance

XL Insurance Company SE

XL House
70 Gracechurch Street
London EC3V 0XL
United Kingdom
Phone +44 (0)20 7933 7000
Direct +44 (0)20 7933 7944
Fax +44 (0)20 7469 1025

Certificate of Employers and Public/Products Liability

Name of Insured Roadstone Ltd

Address 42 Fitzwilliam Square
Dublin 2
Ireland

Insurers XL Insurance Company SE
XL House
70 Gracechurch Street
London
EC3V 0XL

Policy Number GB00002926LI15A (Employers Liability)
GB00002928LI15A (Public/Products Liability)
GB00010400LI15A (Public/Products Liability Excess)

Period Liability 1st February 2015 to 31st January 2016

Business: Activities of the Insured as advised to the Company

Limits of Indemnity Employers Liability €22,700,000 each and every event unlimited per Policy Year
Public Liability €13,000,000 each and every event unlimited per Policy Year
Products Liability €13,000,000 each and every event and in the aggregate per Policy Year
Further Excess Layers are in place with other Insurers
Financial Loss €800,000 in the aggregate per Policy Year

Clauses (PL/Products) Indemnity to Principals
Contractual Liability
Cross Liabilities

Excesses €10,000 Property Damage
€35,000 Financial Loss



SIGNED

For and on behalf of XL Insurance Company SE

Subject to the terms and conditions of the policies currently in force, issued by XL Insurance Company SE and corresponding with the aforementioned policy numbers.

DATED 28th January 2015