Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

A.E.R. W0269-01

The Environmental Protection Agency,
Office of Environmental Enforcement,
Headquarters,
PO Box 3000,
Johnstown Castle Estate,
Co. Wexford.

31st March 2016.

Re: 2016 Annual Environmental Report for W0269-01, Fassaroe Waste Recovery Facility

The licence holder shall submit to the EPA an Annual Environmental Report before 31st March of the following year.

To whom it may concern,

In compliance with waste licence W0269-01, please find enclosed the following details:

(1) Emissions from the facility
(2) Waste management record
(3) Waste recovery report
(4) Program of waste deposition works (including projected completion date).
(5) Complaints summary
(6) Schedule of environmental Objectives and Targets
(7) Environmental management programme- report for previous year
(8) Environmental management programme- report for current year
(9) Pollutant release and Transfer Register- report for current year
(10) Pollutant release and Transfer Register- - report for previous year
(11) Noise monitoring report summary
(12) Dust monitoring report summary
(13) Groundwater monitoring report summary
(14) Monitoring report summary for (i) southern quarry pond (ii) concrete production yard sump (iii) supply pond Results of any environmental monitoring carried out at the facility
(15) Tank and pipeline testing and inspection report
(16) Reported incidents summary
(17) Topographical survey report
(18) Stability assessment report
(19) Bird survey report
(20) Resource use and energy efficiency summary report
(21) Development/Infrastructural works summary (completed in previous year or prepared for current year).
(22) Reports on financial provision made under this licence, management and staffing structure of the facility, and a programme for public information.
(23) Review of Closure, restoration & aftercare management Plan.
(24) Statement of measures in relation to prevention of environmental damage and remedial actions (Environmental Liabilities)
(25) Environmental Liabilities Risk Assessment Review (every three years or more frequently as dictated by relevant on-site change including financial provisions).
(26) Any other items specified by the agency

This is a summary of the activities forW0269-01, week beginning 1st January 2016 to 31st December 2016 for the recycling facility at Fassaroe waste facility, Fassaroe, Bray, Co. Wicklow.

Regards,

Leonard Grogan,
Recycling Manager.

(1) **Emissions from the facility**
The emissions from the facility are covered in sections (11), (12), (13) and (14) of this report.

(2) **Waste management record**
Please find attached a summary of our waste intake. All records of loads received are stored on site for inspection.

(3) **Waste recovery report**
No soil (17 05 04) was imported into the facility in 2016. Of the reprocessed 17 01 01, 0 tonnes of material was re-sold to industry as a National Roads Authority specification material. Any other waste recovered that is sent off site is covered in the PRTR report for Fassaroe which is submitted separately.

(4) **Program of waste deposition works (including projected completion date)**
Quarry backfilling activity at Fassaroe waste recovery facility has ceased. More information about this process is contained in the CRAMP (section 24 of this report, page 2).Please also see figure 2.6 from the EIS (attached) which shows the phasing plan for the site.

(5) **Complaints summary**
Roadstone Fassaroe received no complaints in 2016.

(6) **Schedule of Environmental Objectives and Targets**
This is covered in section 7.

(7) **Environmental Management Programme – report for previous year**
Please find attached.

(8) **Environmental Management Programme – report for current year**
Please find attached

(9) **Pollutant Release and Transfer Register –**report for previous year
This is covered in the PRTR report which has been submitted with this report.

(10) **Pollutant Release and Transfer Register –** report for previous year
This is covered in the PRTR report which has been submitted with this report.

(11) **Noise monitoring report summary**
Please find attached.

(12) **Dust monitoring report summary**
Please find attached.

(13) **Groundwater monitoring report summary**
Please find attached.

(14) **Monitoring report summary for (i) southern quarry pond (ii) concrete production yard sump (iii) supply pond Results of any environmental monitoring carried out at the facility**
Please find attached.

(15) **Tank and pipeline testing and inspection report**
Please find attached.

(16) **Reported incidents summary**
Please find attached.

(17) **Topographical survey report**
A description of the topography is included in the ELRA (section 25 of this report, pages 1 to 8). Please find included the following;
Figure 1 Site location.
Figure 2 Aerial view of site on Google earth.

Figure 3 Surrounding land uses.
Figure 4 Site detail and monitoring.

(18) **Stability assessment report**
Please find attached.

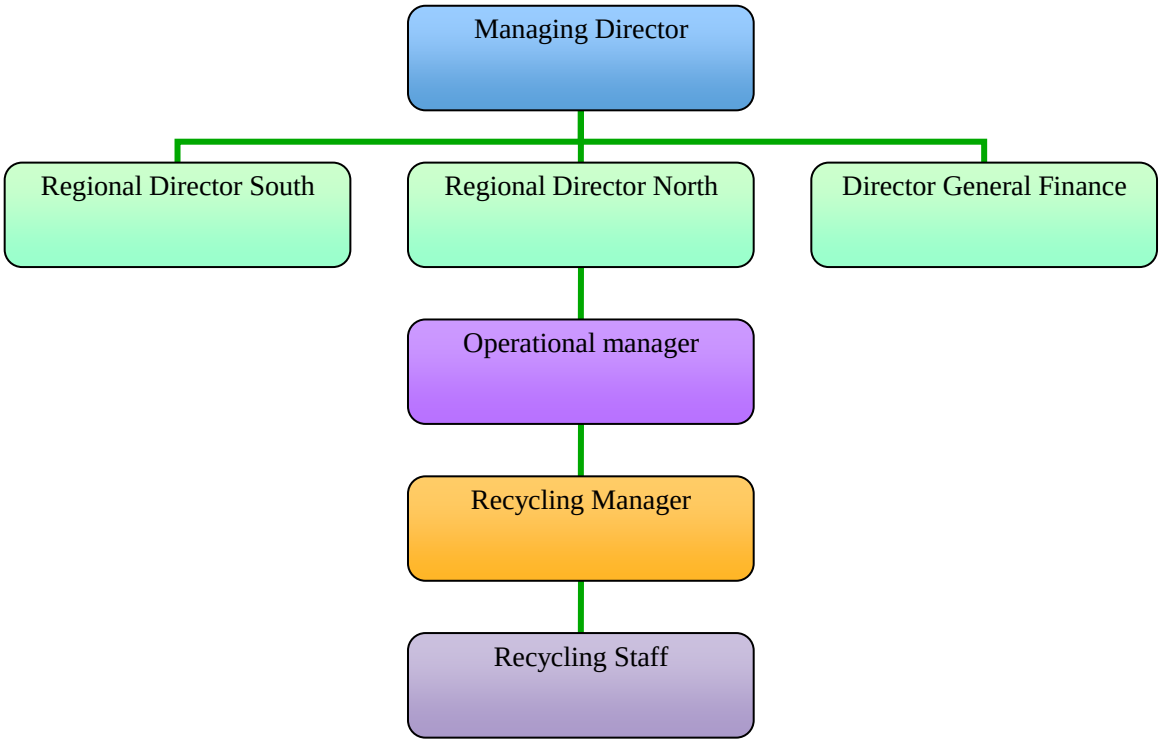
(19) **Bird survey report**
Please find attached.

(20) **Resource use and energy efficiency summary report**
Please find attached.

(21) **Development/Infrastructural works summary (completed in previous year or prepared for current year).**
The specified engineering works for the site are the installation of a ground swale. This was completed in early 2015. Please find attached relevant report. No other infrastructural works were undertaken in 2016.

(22) **Reports on financial provision made under this licence, management and staffing structure of the facility, and a programme for public information.**
A report on financial provisions is contained within the ELRA. Please also find included a copy of Roadstone Ltd's insurance as well as a bank letter confirming our financial stability. Roadstone is part of the CRH group of companies and is clearly in a strong position to offer a 'Parent Company Guarantee' to cover any possible financial risks that may occur.

The management and staffing structure of the facility



The diagram illustrates a section of the overall organisation to highlight the management and reporting structure of the recycling department. The recycling staff include as follows:

- Weighbridge staff,
- Sales staff,
- Loading shovel staff
- Contract crushing staff

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

(23) **Review of Closure, restoration & aftercare management Plan.**
Please find attached.

(24) **Statement of measures in relation to prevention of environmental damage and remedial actions (Environmental Liabilities)**
Please find attached.

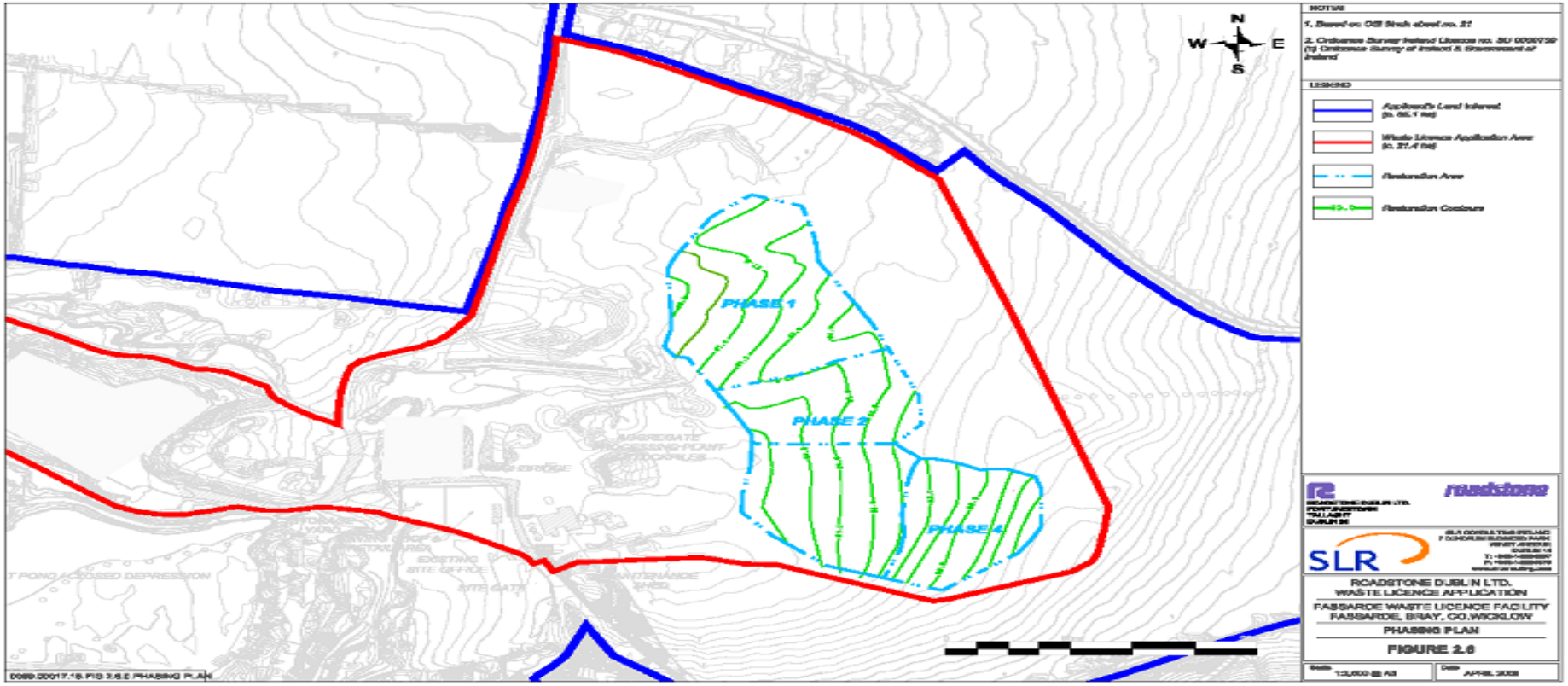
(25) **Environmental Liabilities Risk Assessment Review (every three years or more frequently as dictated by relevant on-site change including financial provisions).**
Please find attached.

(26) **Any other items specified by the agency**
If there are any queries please do not hesitate to contact Roadstone Ltd..

Section 2:
Summary of waste intake and Soil sample Results:

- Soil Intake for 2016 = Nil tons
- C&D Intake for 2016 = 7,624 tons

Section 4:
Figure 2.6 from EIS



Section 7:
Env. Management Programme 2015

Roadstone Wood Group	
Environmental Management Program **Year: 2016** **Location: Fassaroe Recycling Facility**	**Doc.No: EMS/08** **Page 7 of 180** **Revision: 0** **Date:** March 2016 **Approved By: Colin Doyle**

Target	Improvement	Cost	Resp.	Completion Date
Land Remediation	Commence process of surrendering licence	€1000	LG	2017

| PRTR# : W0269 | Facility Name : Fassaroe Waste Recovery Facility | Filename : W0269_2016.xls | Return Year : 2016 |

Guidance to completing the PRTR workbook

PRTR Returns Workbook

Version 1.1.19

REFERENCE YEAR	2016

1. FACILITY IDENTIFICATION

Parent Company Name	Roadstone Limited
Facility Name	Fassaroe Waste Recovery Facility
PRTR Identification Number	W0269
Licence Number	W0269-01

Classes of Activity

No.	**class_name**
-	Refer to PRTR class activities below

Address 1	Fassaroe Avenue
Address 2	Fassaroe
Address 3	Bray
Address 4	
	Wicklow
Country	Ireland
Coordinates of Location	-6.14849423945 53.204259
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	mkelleher@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	1
User Feedback/Comments	
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

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A.E.R. W0269-01

4.1 RELEASES TO AIR Link to previous years emissions data | PRTR# : W0269 | Facility Name : Fassaroe Waste Recovery Facility | Filename : W0269_2016.xls | Return Year : 2016 | 29/03/2017 11:27

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
			Method Used					
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

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		
			Method Used					
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
01	Methane (CH4)	C	OTH	EPA Toolset calculation	1.1	1.1	0.0	0.0
02	Carbon monoxide (CO)	C	OTH	EPA Toolset calculation	209.0	209.0	0.0	0.0
03	Carbon dioxide (CO2)	C	OTH	EPA Toolset calculation	61620.0	61620.0	0.0	0.0
05	Nitrous oxide (N2O)	C	OTH	EPA Toolset calculation	2.6	2.6	0.0	0.0
06	Ammonia (NH3)	C	OTH	EPA Toolset calculation	0.2	0.2	0.0	0.0
07	Non-methane volatile organic compounds (NMVOC)	C	OTH	EPA Toolset calculation	66.0	66.0	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	C	OTH	EPA Toolset calculation	639.4	639.4	0.0	0.0
11	Sulphur oxides (SOx/SO2)	C	OTH	EPA Toolset calculation	62.4	62.4	0.0	0.0
86	**Particulate matter (PM10)**	C	OTH	EPA Toolset calculation	40.7	40.7	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		
			Method Used					
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

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4.2 RELEASES TO WATERS

Link to previous years emissions data

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

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					ADD EMISSION POINT	QUANTITY		
			Method Used					
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

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					ADD EMISSION POINT	QUANTITY		
			Method Used					
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

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					ADD EMISSION POINT	QUANTITY		
			Method Used					
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

4.3 RELEASES TO WASTEWATER OR SEWER

Link to previous years emissions data

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		
			Method Used					
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

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		
			Method Used					
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

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4.4 RELEASES TO LAND

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND					Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY	
			Method Used				
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	
			Method Used				
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

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Please enter all quantities on this sheet in Tonnes

0

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	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)
						M/C/E	Method Used					
Within the Country	13 02 08	Yes	0.227	other engine, gear and lubricating oils	R9	C	Volume Calculation	Offsite in Ireland	ENVA,184-1	Clonminam Industrial Estate,Portlaoise,.,County Laoise,Ireland	ENVA,184-1,Clonminam Industrial Estate,Portlaoise,.,County Laoise,Ireland	Clonminam Industrial Estate,Portlaoise,.,County Laoise,Ireland

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Section 11:
Noise Monitoring report

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

A.E.R. W0269-01

BHP/CEM/23/A

Analysing
Testing
Consulting
Calibrating

TEST REPORT 131667

Client:
Roadstone Wood Ltd
Fortunestown
Tallaght
Dublin 24

BHP Ref No.: 16/11/0800
Order No.:
Date Received: 9th & 10th November 2016
Date Tested: 9th & 10th November 2016
Test Specification: Noise Monitoring

BHP
New Road
Thomondgate
Limerick
Ireland
Tel +353 61 455399
Fax + 353 61 455447
E Mail
dervlapurcell@bhp.ie

FAO: Cillian Casey

Item: Noise survey at noise sensitive locations at the Roadstone facility, Fassaroe, Bray, Co. Wicklow.

For and on behalf of BHP Ltd.

Dervla Purcell
Date Issued: 16th November 2016
Supplement to report No. N/A

Contents

1.0 Scope of survey

At the request of Roadstone Wood Ltd, BHP undertook noise monitoring at their operation in Fassaroe, Bray, Co. Wicklow. 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 five nominated noise locations at the operation in Fassaroe, Bray, Co. Wicklow

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's (serial numbers D21298FF).
The SLM's were calibrated at the start of the survey with a CRL 511E calibrator (serial number 039592). 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 is 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.

30-minute daytime levels were measured at each location. 30-minute night time levels were measured at one location.

Appendix A contains a site map of the quarry showing the noise monitoring locations.

Appendix B contains photographs of the noise monitoring points.

3.0 Date of survey

The daytime survey was carried out on 10th November 2016 by Aidan Daffy while the night time monitoring was carried out on the 9th of November by Aidan Daffy.

4.0 Results

4.1 Noise levels:

Levels are presented on the following page.

Roadstone Ltd
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Day-time Measurements - Noise Locations – Fassaroe, Bray, Co. Wicklow (10th November 2016)

Location	Sampling Interval	Duration (mins)	L_{AEQ} dB	L_{A10} dB	L_{A90} dB	Wind speed m/s	Sampling notes
N1	09.23-09.53Hrs	30	44	45	40	1-2 NW	Activity around the retail yard was audible at 43-48dBA with teleporter and bucket rattle at up to 55dBA at times. Trucks entering and leaving the concrete plant were audible at 45-50dBA while the concrete plant was audible at 38-42dBA in the absence of truck movement.
N2	09.35-10.05Hrs	30	46	48	43	2-3 NW	Traffic from the N11 was almost constant at 40-45dBA. Some sounds audible from the retail yard at 43-48dBA with reversing siren reaching 52dBA at times. Truck at recycling area was audible at 40-45dBA.
N3	10.09-10.39Hrs	30	47	47	41	2-3 NW	Wind noise was at 50dBA at times. Aircraft passing overhead at up to 60dBA. Concrete plant was audible at 40-45dBA at times.
N4	10.20-10.50Hrs	30	52	51	44	2-3 NW	Concrete plant audible at 45-50dBA. Truck horn audible three times at 70dBA. Aircraft passing overhead at up to 60dBA.
N5	10.52-11.22Hrs	30	53	54	43	2-3 NW	Frequent traffic entering and exiting the quarry at up to 72dBA. Activity audible from the retail area at 45-50dBA. Wind noise bringing levels up to 52dBA at times.

=

Night-time Measurements - Noise Locations – Fassaroe, Bray, Co. Wicklow (9th November 2016)

Location	Sampling Interval	Duration (mins)	L_{AEQ} dB	L_{A10} dB	L_{A90} dB	Wind speed m/s	Sampling notes
N5	20.05-20.35Hrs	30	38	40	34	1-2 NW	Distant traffic and wind noise keep levels at 37-43dBA. Some activity audible from the concrete plant at about 35dBA. Monitoring period was paused for 2 minutes to talk to security.

5.0 Interpretation of results

5.1 Noise levels;

The noise limits for the Roadstone operation in Fassaroe, Bray, Co.Wicklow are as follows:

Daytime Limit L_{Aeq} 55dB

Night-time Limit L_{Aeq} 45dB

5.1.1 Day-time levels:

As can be seen in section 4.1, L_{Aeq} levels at the noise monitoring locations are lower than the daytime limit of 55dB at all the locations.

5.1.2 Night-time levels:

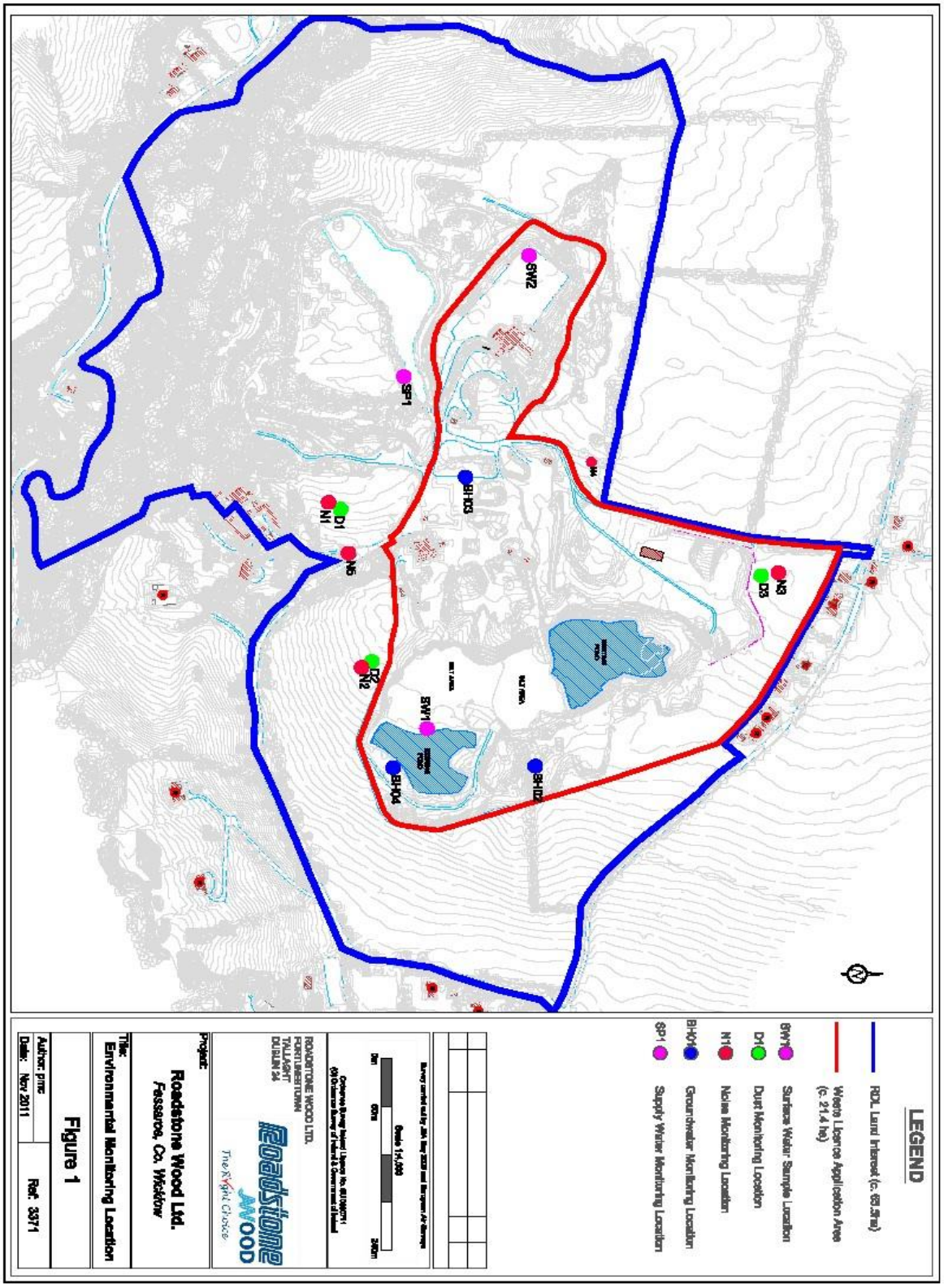
The night time measurement was taken at N5. The location is below the limit of 45dB, this is not considered an exceedance of the site limit.

6.0 Conclusions

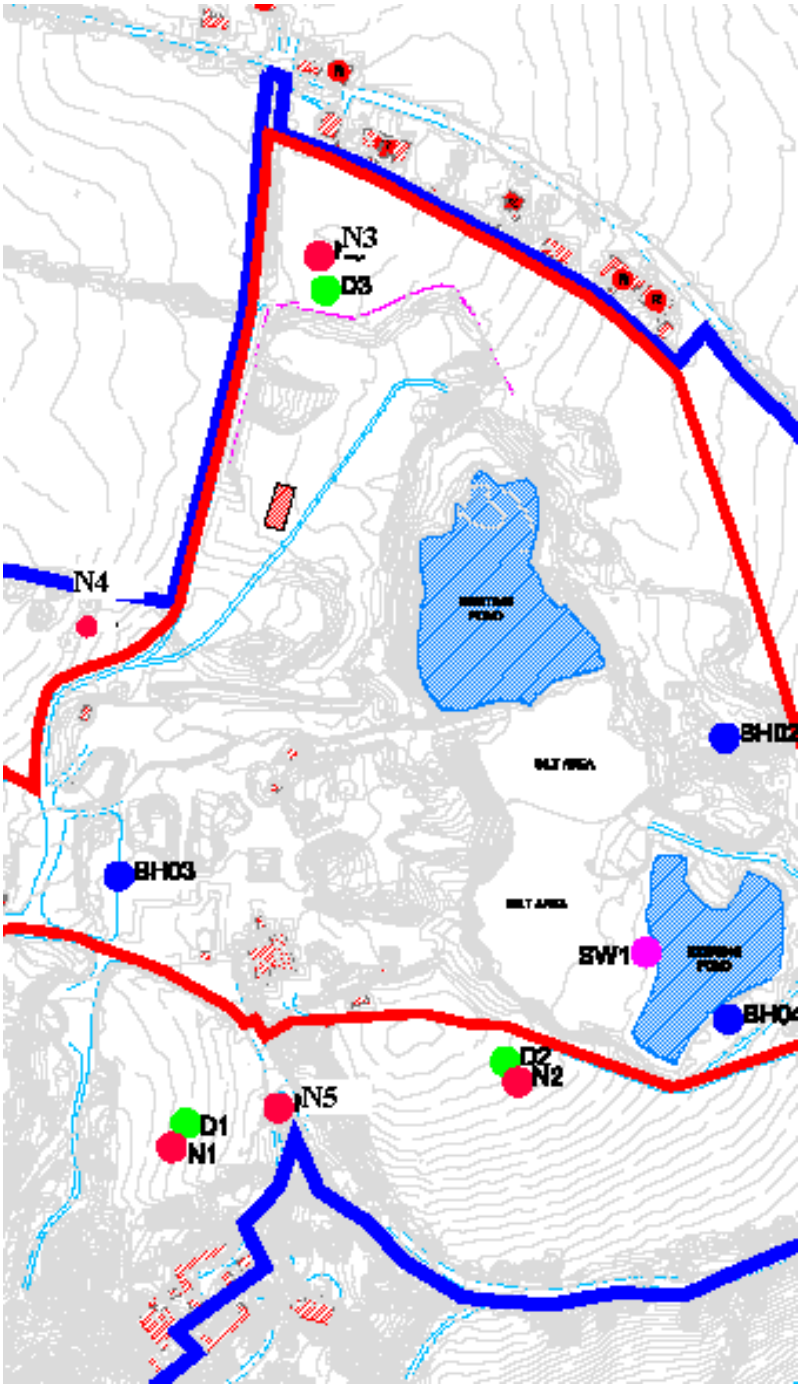
The noise contribution made by the operation does not exceed the daytime limit of 55dB at the noise monitoring locations.

The noise contribution made by the operation does not exceed the night time limit of 45dB at the front gate.

Appendix A :Site map showing noise monitoring locations



Fassaroe noise monitoring locations close up



Appendix B

Photographs of noise monitoring equipment on-site during monitoring

Noise monitoring equipment on-site at N1

Noise monitoring equipment on-site at N2

Noise monitoring equipment on-site at N3

Noise monitoring equipment on-site at N4

Noise monitoring equipment on-site at N5

Section 12:
Dust Monitoring Report

Fassaroe Dust Deposition 2016

Sample No	FASSAROE		Net Wt of Dishes from Desiccator (A)				Total Wt of all Dishes (A)	Gross Wt of Dishes + residue from Desiccator (B)				Total Wt of all Dishes (B)	Mass of Dust (mg) (B-A)	Dustfall - mg/(m^2 d) (max 350)
Placement Date	D1	Dish No:►	91					91						
Dec-02	15DF0339	Dish Wt (g) :►	63.6981				63.6981	63.7091				63.7091	11	57
Collection Date	D2	Dish No:►	22					22						
Jan-02	15DF0340	Dish Wt (g) :►	61.0548				61.0548	61.0667				61.0667	11.9	62
Test date	D3	Dish No:►	65					65						
Jan-05	15DF0341	Dish Wt (g) :►	65.5981				65.5981	65.6096				65.6096	11.5	60
		Dish No:►												
		Dish Wt (g) :►					0					0	0	0
		Dish No:►												
		Dish Wt (g) :►					0					0	0	0
		Dish No:►												
		Dish Wt (g) :►					0					0	0	0
Period - days	31	Collecting Surface	0.0062											
Oven used	BGL48	Temp°C	105°C		Balance	BGL 42				Sampling Period 30 ± 2 Days				
Comment:														

Section 13:
Groundwater monitoring report summary

BH-02

Date	01/03/2016	14/06/2016	04/08/2016	09/09/2016	09/12/2016
Ammonia as NH4	<0.10	<0.10	<0.10	<0.10	<0.10
mmoniacal Nitroge	<0.08	<0.08	<0.08	<0.08	<0.08
Antimony (ug/l)#	-	-	0.19	0.35	-
Arsenic (ug/l)#	0.83	0.63	1.8	0.76	0.002
Cadmium (ug/l)#	-	-	<1	<0.03	-
Chloride	25	26	25	25	-
Chromium (ug/l)#	-	-	1.19	1.2	-
luctivity (uS/cm@2	591	576	666	634	620
Copper (ug/l)#	-	-	0.6	<0.4	-
EPH (C_{10}-C_{40})##	<0.010	0.19	-	-	-
roundwater Level (r	-	-	-	-	-
Lead (ug/l)#	-	-	<1	0.14	-
Nickel (ug/l)#	-	-	0.7	<0.5	-
PAH(total) (ug/l)	-	-	-	0.06	-
pH	7.4	7.4	7.5	7.3	7.6
Sulphate	46	53	47	47	-
PH (C10-C40)##(ug/	-	-	-	<0.010	<0.010
Visual	s of suspended solids prese	turbid with lots of suspended solids	brown, turbid but clear upon settling down	turbid	very turbid
Zinc (ug/l)#	-	-	1.9	<1.3	-
Mineral Oil## (ug/l)	-	-	-	-	-
Suspended Solids	-	-	-	-	-
TOC	-	-	-	-	-

BH-03

Date	01/03/2016	14/06/2016	04/08/2016	09/09/2016	09/12/2016
Ammonia as NH4	<0.10	<0.10	No Flow	<0.10	No Flow
Ammoniacal Nitrogen	<0.08	<0.08	No Flow	<0.08	No Flow
Antimony (ug/l)#	-	-	No Flow	0.27	No Flow
Arsenic (ug/l)#	0.59	0.18	No Flow	0.28	No Flow
Cadmium (ug/l)#	-	-	No Flow	<0.03	No Flow
Chloride	16	15	No Flow	13	No Flow
Chromium (ug/l)#	-	-	No Flow	1.7	No Flow
Conductivity (uS/cm@20oC	562	539	No Flow	554	No Flow
Copper (ug/l)#	-	-	No Flow	<0.4	No Flow
EPH (C_{10}-C_{40})##	<0.010	0.038	No Flow	-	No Flow
Groundwater Level (m)	-	-	No Flow		No Flow
Lead (ug/l)#	-	-	No Flow	<0.09	No Flow
Nickel (ug/l)#	-	-	No Flow	<0.5	No Flow
PAH(total) (ug/l)	-	-	No Flow	0.1	No Flow
pH	7.3	7.4	No Flow	7.5	No Flow
Sulphate	36	44	No Flow	40	No Flow
TPH (C10-C40)##(ug/l)	-	-	No Flow	<0.010	No Flow
Visual	some suspended solids present	slightly turbid	No Flow	turbid	No Flow
Zinc (ug/l)#	-	-	No Flow	<1.3	No Flow
Mineral Oil## (ug/l)	-	-	No Flow	-	No Flow
Suspended Solids	-	-	No Flow	-	No Flow
TOC	-	-	No Flow	-	No Flow

BH-04

Date	01/03/2016	14/06/2016	14/08/2016	09/09/2016	09/12/2016
Ammonia as NH4	0.34	0.85	<0.10	0.18	<0.10
Ammoniacal Nitrogen	0.26	0.66	<0.08	0.14	<0.08
Antimony (ug/l)#	-		<0.17	0.24	-
Arsenic (ug/l)#	16	18	1.8	11	0.016
Cadmium (ug/l)#	-		<1	<0.03	-
Chloride	21	22	22	23	-
Chromium (ug/l)#	-		<1	<0.25	-
Conductivity (uS/cm@20oC)	537	492	561	575	531
Copper (ug/l)#	-	-	0.6	0.5	-
EPH (C_{10}-C_{40})##	<0.010	0.051	-		-
Groundwater Level (m)	-	-	-		-
Lead (ug/l)#	-	-	3.13	0.16	-
Nickel (ug/l)#	-	-	0.9	<0.5	-
PAH(total) (ug/l)	-	-	-	<0.04	-
pH	7.9	8.5	7.9	7.6	8.4
Sulphate	18	19	19	18	-
TPH (C10-C40)##(ug/l)	-	-	-	<0.010	<0.010
Visual	lots of suspended solids present	very turbid with visible suspended solids	brown, turbid but clear upon settling down	turbid, greyish	-
Zinc (ug/l)#	-	-	2.1	<1.3	-
Mineral Oil## (ug/l)	-	-	-	-	-
Suspended Solids	-	-	-	-	-
TOC	-	-	-	-	-

Section 14:
Surface water results

Date	15/01/2016	02/02/2016	01/03/2016	07/04/2016	05/05/2016	13/06/2016	05/07/2016	04/08/2016	09/09/2016	06/10/2016	10/11/2016	01/12/2016
Ammonia as NH4	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Ammoniacal Nitrogen	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Antimony (ug/l)#	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Arsenic (ug/l)#	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Cadmium (ug/l)#	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Chloride	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Chromium (ug/l)#	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Conductivity (uS/cm@20oC)	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Copper (ug/l)#	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
EPH (C_{10}-C_{40})##	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Groundwater Level (m)	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Lead (ug/l)#	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Nickel (ug/l)#	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
PAH(total) (ug/l)	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
pH	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Sulphate	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
TPH (C10-C40)##(ug/l)	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Visual	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Zinc (ug/l)#	-	-	No Flow	No Flow	No Flow	-	-	No Flow	No Flow	No Flow	No Flow	No Flow
Mineral Oil## (ug/l)	-	-	No Flow	No Flow	No Flow	0.091	-	No Flow	No Flow	No Flow	No Flow	No Flow
Suspended Solids	9	125	No Flow	No Flow	No Flow	81	3	No Flow	No Flow	No Flow	No Flow	No Flow
TOC	17	21	No Flow	No Flow	No Flow	4.5	4.2	No Flow	No Flow	No Flow	No Flow	No Flow

Section 15:
Tank and pipeline inspection report

Environmental Efficiency

Bray (Ireland) 01 276 1428
Cork (Ireland) 021 453 6155
Lisburn (N. Ireland) 028 9262 6733
Birmingham (GB) 0121 673 1804

Bund Integrity Assessment

Roadstone Ltd.

Site/Quarry: Fassaroe

Document Number 1880-23 v1.00

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
- Member Environmental Services Association
- EMPI Membership

QF 1. v2 Document Lead Sheet

Document Title	Bund Integrity Assessment
Project No.	1880
Document No.	1880-23
Client	Roadstone
Site	Fassaroe

Issue	Status	Date	Author	Signed for and on behalf of	
				Environmental Efficiency	Client
1.00	Approved	02/12/2016	RBS		

SR02 v1.11

EEC Document Author: Bob Sutcliffe, CEng, MIEI

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History

Issue 1.00 Issued

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	Optional Action
Auto Diesel	Fail	Yes	No	No	No	Repair bund walls. Install interceptor	Protect bund from rain or mark maximum quantity of rainwater. Protect bund walls from vehicle strikes
Yellow Self Bunded Tanks	Pass	Yes	Yes	Yes	N/A	None	Install a self-test
Drum Racks	Fail	Yes	Yes	Yes	N/A	Remove oil from sump.	None
Waste Oil Bund	Pass	Yes	Yes	Yes	N/A	None	Install a self-test
Gasoil bund	Pass	Yes	Yes	Yes	N/A	None	Repair self test

Notes

2. Bund inspection results

2.1 Marked Gasoil

Bund Integrity Assessment

Aspect	Value/Finding	Comment
Date of Assessment	28-Oct 16	
Location	yard	
Bund type	Local	
Bund construction	Block	
Wall integrity defects	Bund partly full of water, walls damaged	
Base Integrity defects	Not determined	Base could not be inspected as bund partly full of rainwater.
Assessment result	Fail	Fail due to cracks in wall

Capacity check

Aspect	Value/Finding	Comment
Bund capacity, Litres	97,526	Visual assessment shows that bund has sufficient capacity
110% largest tank, litres	Sufficient	
25% of all tanks, litres	Sufficient	
Assessment result	Pass	

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 quantity of allowable rainwater
Is rainwater discharged by gravity?	No (Pass)	Best practice is not for gravity discharge.
Is rainwater discharge point securely locked?	N/A as no gravity discharge or no rain water	Best practice is securely lock gravity discharge points.
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?	No (Pass)	For masonry bunds, best practice is to route pipes over bund walls.
Is bund protected from vehicle strikes?	No (Fail)	Best practice is to protect block and plastic bunds from vehicle strikes.
Is bund fitted with a self-test?	Not applicable to non self-bunded tanks	Best practice is for self bunded tanks to have a self-test device.
Is self-test working?		Best practice is for self bunded tanks to have the self-test device regularly tested.
Does self-test device indicate a leak?		Where a leak is detected in a self bunded tank this may indicate a rupture of the inner skin.

Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	Yes	
Impermeable ground?	No (Fail)	There is an impermeable area but it is insufficient as evidence of run-off to ground.
Interceptor?	Yes Class 1 Hydrocarbon interceptor in the concrete yard. The interceptor is located to the rear of the agg silos of the concrete plant, at the lowest point of the yard.	Best practice is for refuelling areas to have an interceptor
Defects/Comments		No comment

Essential action
Repair damaged walls
Install interceptor at refuelling area
Consider increasing size of impermeable area

Optional action

Protect bund from rain or mark maximum quantity of rainwater
Protect bund walls from vehicle strikes

Figure 2-1 Example of crack in bund wall

Figure 2-2 Leak from base of bund wall

2.2 Yellow Self Bunded Tanks

Bund Integrity Assessment

Aspect	Value/Finding	Comment
Date of Assessment	28-Oct 16	No comment
Location	concrete plant	
Bund type	Local (self bunded tank)	
Bund construction	Plastic	
Wall integrity defects	walls inspected - no defects	
Base Integrity defects	Base inspected - no defects	
Assessment result	Pass	

Capacity check

Aspect	Value/Finding	Comment
Bund capacity, Litres	Sufficient	No comment
110% largest tank, litres		
25% of all tanks, litres		
Assessment result		

Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes (Pass)	Best practice is to protect from rain
Maximum quantity of rainwater marked?	N/A as protected from rain	N/A as bund protected from rain
Is rainwater discharged by gravity?	N/A as protected from rain	
Is rainwater discharge point securely locked?	N/A as no gravity discharge or no rain water	
Are tank filling points within bund?	N/A as self bunded	Best practice is for tank filling points to be within the bund.
Do pipes pass through bund wall?	N/A for steel or plastic construction	For masonry bunds, best practice is to route pipes over bund walls.
Is bund protected from vehicle strikes?	Yes (Pass)	Best practice is to protect block and plastic bunds from vehicle strikes.
Is bund fitted with a self-test?	No (Fail)	Best practice is for self bunded tanks to have a self-test device.
Is self-test working?	Not applicable as no self-test	
Does self-test device indicate a leak?	Not applicable as no self-test	

Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	No	
Impermeable ground?	N/A as no refuelling area	Best practice is for refuelling areas to be impermeable
Interceptor?		
Defects/Comments		

Essential action

No essential action

Optional action

Fit a self-test for leaks in void and test at monthly intervals.

Figure 2-3 Bund identification

2.4 Waste oil bund

Bund Integrity Assessment

Aspect	Value/Finding	Comment
Date of Assessment	28-Oct 16	No comment
Location	garage	
Bund type	Local (self bunded tank)	
Bund construction	Plastic	
Wall integrity defects	walls inspected - no defects	
Base Integrity defects	walls inspected - no defects	
Assessment result	Pass	

Capacity check

Aspect	Value/Finding	Comment
Bund capacity, Litres	Sufficient	No comment
110% largest tank, litres		
25% of all tanks, litres		
Assessment result		

Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes (Pass)	Best practice is to protect from rain
Maximum quantity of rainwater marked?	N/A as protected from rain	
Is rainwater discharged by gravity?		
Is rainwater discharge point securely locked?		
Are tank filling points within bund?	N/A as self bunded	Best practice is for tank filling points to be within the bund.
Do pipes pass through bund wall?	No (Pass)	For masonry bunds, best practice is to route pipes over bund walls.
Is bund protected from vehicle strikes?	No (Fail)	Best practice is to protect block and plastic bunds from vehicle strikes.
Is bund fitted with a self-test?	No (Fail)	Best practice is for self bunded tanks to have a self-test device.
Is self-test working?	Not applicable as no self-test	Best practice is for self bunded tanks to have the self-test device regularly tested.
Does self-test device indicate a leak?		

Interceptor

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

Essential action

None

Optional action

Fit a self-test for leaks in void and test at monthly intervals

Figure 2-6 Bund identification

2.5 Gas oil bund

Bund Integrity Assessment

Aspect	Value/Finding	Comment
Date of Assessment	28-Oct 16	No comment
Location	garage	
Bund type	Local (self bunded tank)	
Bund construction	Plastic	
Wall integrity defects	walls inspected - no defects	
Base Integrity defects	Base inspected - no defects	
Assessment result	Pass	

Capacity check

Aspect	Value/Finding	Comment
Bund capacity, Litres	Sufficient	No comment
110% largest tank, litres		
25% of all tanks, litres		
Assessment result		

Good practice

Aspect	Value/Finding	Comment
Bund protected from rain?	Yes (Pass)	Best practice is to protect from rain
Maximum quantity of rainwater marked?	N/A as protected from rain	N/A as bund protected from rain
Is rainwater discharged by gravity?		
Is rainwater discharge point securely locked?		
Are tank filling points within bund?	N/A as self bunded	Best practice is for tank filling points to be within the bund.
Do pipes pass through bund wall?	N/A for steel or plastic construction	For masonry bunds, best practice is to route pipes over bund walls.
Is bund protected from vehicle strikes?	Yes (Pass)	Best practice is to protect block and plastic bunds from vehicle strikes.
Is bund fitted with a self-test?	Yes (Pass)	Best practice is for self bunded tanks to have a self-test device.
Is self-test working?	No (Fail)	Best practice is for self bunded tanks to have the self-test device regularly tested.
Does self-test device indicate a leak?	Not determined	

Interceptor

Aspect	Value/Finding	Comment
Associated refuelling area?	No	
Impermeable ground?	N/A as no refuelling area	Best practice is for refuelling areas to be impermeable
Interceptor?	N/A as no refuelling area	Best practice is for refuelling areas to have an interceptor
Defects/Comments	N/A as no refuelling area	

Essential action
None

Optional action
Repair self-test

Figure 2-7 Bund identification

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

Section 18:
Stability Assessment Report

27 March 2012

Mr. Fearghal Philips
Facility Manager
Roadstone Wood Ltd.
Fassaroe
Bray
Co. Wicklow

Our Ref:501.00180.00028
Your Ref: WL0269-01
Dear Fearghal

RE: GEOTECHNICAL INSPECTION OF SLOPES AT ROADSTONE WOOD WASTE RECOVERY FACILITY, FASSAROE, BRAY, CO.WICKLOW
WASTE LICENCE REF. NO. W0269-01

Further to my visit to your soil / construction and demolition waste recovery facility in Fassaroe earlier today to undertake a geotechnical inspection of existing slope stability, I write to formally advise of my findings.
At the time of the inspection, infilling of the void created by sand and gravel extraction was progressing gradually south and eastwards from the north-western corner of the former pit. The weather at the time of the inspection was warm, dry and sunny. Weather in the weeks immediately preceding the inspection had also been largely dry.

Backfilled Soil Slopes

In general, the temporary slopes developed in backfilled material around the north-western corner of the former pit, estimated to vary from approximately 12m to 16m high and approximately 20° to 30°, were observed to be marginally stable. Photographs of the existing slopes in backfilled material are presented in Plates 1 and 2.
The slopes comprise variable imported natural soils excavated at construction and utilities works sites. The soils principally comprise clayey glacial till, granitic sand and/or weathered granite rock. There were occasional inclusions of construction and demolition type waste within the natural soils, principally lumps of ready mixed concrete and fragments of blocks, bricks and ceramics.
The marginal stability of the backfilled slopes is only to be expected, given that they comprise imported material which has been end-tipped from HGV lorries and had not been spread or compacted by bulldozers or other earthmoving plant. That said, there was no evidence at the time of the site inspection of any recent or imminent instability across the temporary backfilled slopes such as development of tension cracks behind the crest, toe bulging, near-vertical backscarps etc.
Although there was also no evidence of small scale localised erosion of the exposed soils by surface water run-off and no obvious development of downslope erosion gullies or channels, it is considered likely that this is a reflection of the largely dry weather in the weeks immediately preceding the site inspection. It is however likely that some localised surface erosion could arise in loose materials placed across these slopes during and after intense rainfall events, particularly over the wetter winter months.
The marginal stability of the slopes is not considered to present any environmental risk for the following reasons:

(i) Although the stability of slopes developed in backfilled material is marginal and there may be a potential instability risk, it generally only arises for a short period of time until such time as the slope is covered by newly imported materials or the slope is re-worked and re-profiled by bulldozers and other earthworks plant;
(ii) The imported material is being placed within a closed depression (the former pit) which provides a topographic constraint to migration of slipped material downslope / overground to surface watercourses.

From a facility management perspective, the key issue is to ensure that trucks which are end-tipping imported soil do not reverse too close to the crest of the backfilled slope and that site personnel avoid the area around the toe of the backfilled slopes as material is end tipped over it. It is understood that safety awareness and management programs are in place to address associated health, safety and welfare issues for both drivers and site operatives.

Former Pit Side Slopes

In general, the side slopes around the eastern and southern perimeter of the former pit developed in natural overconsolidated sand and gravel were estimated to vary from approximately 5m to 10m in height and to have typical gradients of 35° to 50°, increasing locally to near-vertical along the southern perimeter. Photographs of perimeter side slopes around the former pit are presented in Plates 3 and 4.

Strong and resilient vegetation growth has established across the lower, shallower slopes along much of the eastern and southern perimeter of the former pit. This vegetation growth testifies to the stability of these slopes and also serves to enhance it. Where slope instability does occur around the edge of the former pit, it is largely confined to bare (i.e. unvegetated), steep (near-vertical) side slopes.

There does not appear to be any evidence of large scale (global) slope failure around the bare side slopes, rather it would appear that they are experiencing gradual regression, erosion and re-grading under both gravitational and climatic influences. No tension cracking or other sign of imminent instability was identified upslope or behind the crest of the steeper side slopes. The side slopes were generally dry, with no evidence of groundwater seepage, other than locally east of the descent ramp in the south-western corner of the former pit. It was also observed that

(i) vegetation growth (grass and shrubbery) upslope and behind the steeper slopes was well established,
(ii) small to medium sized trees were growing vertically upwards across these slopes and
(iii) vegetation was managing to establish itself over eroded sand and gravel which had accumulated at the toe of these slopes.

Taken together these observations indicate that the existing steep perimeter side slopes are relatively stable, albeit they are likely to be experiencing ongoing small scale spalling and erosion. This assessment concurs with experience and observations of Roadstone Wood's local site management.

It was observed in the course of the slope inspection that perimeter fencing had been installed behind the perimeter side slopes of the former pit as a safety precaution and to prevent trespass / access to the pond in the south eastern corner of the former pit.

Conclusions

The backfilled slopes of imported inert soil are likely to be only marginally stable given that they generally comprise imported material which has been end-tipped from HGV lorries. However any instability risk is only likely to arise for a short period of time until such time as the slope is covered by newly imported materials or the slope is re-worked and re-profiled by bulldozers and other earthworks plant.

There is no environmental risk associated with instability of backfilled materials as the slope is located within a closed depression which provides a topographic constraint to migration of slipped material downslope / overground to surface watercourses. The key issue with slope stability is to manage health and safety risks and to

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- ensure that trucks which are end-tipping imported soil do not reverse too close to the crest of the backfilled slope
- ensure site personnel avoid the area around the toe of the backfilled slopes as material is end tipped over it.

As regards the perimeter side slopes of the former sand and gravel pit, given

- their relative stability,
- that no site personnel are required to work immediately beyond the toe of these slopes and
- that any slope instability which may arise will be topographically constrained within the former pit void,

it is considered that there is no requirement for any specific management or remedial measures in respect of side slope stability, other than ongoing regular visual inspection and monitoring.

Should you wish to discuss this assessment or any of the issues raised herein, please contact the undersigned.

Yours sincerely

SLR Consulting Ireland

Derek Luby
Technical Director

Plate 1 : Global View of Slope in Backfilled Material in NW Corner of Former Pit

Plate 2 : View Southwards across Existing Backfilled Slope

Plate 3 : View of Eastern and Southern Slopes of Former Pit from NW Corner

Plate 4 : View of Both Vegetated and Bare Perimeter Side Slopes in SE Corner of Former Pit

Section 19:
Bird survey report

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

A.E.R. W0269-01

Roadstone Wood Ltd

Bird Survey (2011)

Fassaroe Waste Recovery Facility.

October 2011

TOBIN CONSULTING ENGINEERS

Roadstone Ltd
Fortunestown,
Tallaght

A.E.R. W0269-01

REPORT

PROJECT: **Bird Survey (2011)**

Fassaroe Waste Recovery Facility

CLIENT: **Roadstone Wood Ltd**

COMPANY: **TOBIN Consulting Engineers**

Block 10-4

Blanchardstown Corporate Park

Dublin 15

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Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

A.E.R. W0269-01

DOCUMENT AMENDMENT RECORD

Client: **Roadstone Wood Ltd**

Project: **Fassaroe Waste Recovery Facility**

Title: **Bird Survey (2011)**

PROJECT NUMBER: 3959				DOCUMENT REF: Fassaroe BS 2011			
A	Draft Report	RM	13/10/11	ST	17/10/11	DG	17/10/11
Revision	**Description & Rationale**	**Originated**	**Date**	**Checked**	**Date**	**Authorised**	**Date**
TOBIN Consulting Engineers							

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

TABLE OF CONTENTS

Introduction

Tobin Consulting Engineers were commissioned by Roadstone Wood Ltd to undertake a bird survey at the Fassaroe Waste Recovery Facility and environs near Bray, County Wicklow. The site consists of a former sand quarry. Much of the site is inactive now and a range of habitats occur which influence the bird fauna on site. It should be noted though that existing works on site allow for the retention of key habitats for potential breeding birds of conservation concern on the site.

The aim of this survey was to address Condition 6.17 of the EPA Waste Licence W0269-01 which requests a bird survey to record species of conservation concern. It should be noted that the survey was conducted outside the breeding season for birds but nevertheless provides a reasonable assessment of birds of conservation concern likely to be recorded.

Site description

The survey area included the Roadstone Wood site at Fassaroe and surrounding farmland. The area surveyed extended to approximately 48 hectares[1]. The Roadstone Wood site is a former? sand quarry much of which is now undisturbed by development. Hence many habitats have developed as a result of vegetation re-colonising former bare sand in the last number of years.

This re-vegetation has likely led to an increase in bird diversity and abundance compared to when the site was more actively quarried. Habitats on the site are detailed below with key habitats of importance for birds highlighted;

- **Extensive fringing scrub around the site boundary**
- **Deciduous woodland plantation**
- **Established deciduous woodland**
- **Mature hedgerows**
- **Unimproved grasslands**
- Arable farmland
- **Wetlands and willow scrub in former siltation ponds**
- Bare ground where materials are being deposited
- Built areas (buildings, road surfaces etc)
- **Re-colonising bare ground (weed growth)**

[1] HTTP://Webgis.npws.ie

Methodology

The site was surveyed for the presence of birds on 13th October 2011. The weather was mild and warm and hence suitable for surveying.

The survey area "site" included the entire property including habitats immediately surrounding the site boundary.

Bird species, numbers and distribution on the site were assessed by carrying out a complete walkover survey broadly following procedures detailed in the methodology devised for the Countryside Bird Survey (CBS). The CBS is a scheme organised by Bird Watch Ireland that is used to assess populations of breeding birds throughout Ireland.

The methodology involved walking transects across the survey area recording birds seen. In addition all specific habitats within the site likely to conceal birds of conservation note e.g. wetlands and scrub were checked.

The locations of birds were recorded on field maps in order to ensure that no birds were counted twice.

During the survey regular stops were made to scan and listen for birds, including immediately adjoining areas beyond the proposed boundary. The site visit was made to coincide with the diurnal peak of bird activity (0600 – 1300).

Results

The site is a locally diverse area for common farmland and woodland birds and attracts birds in from surrounding areas. This diversity is also a reflection of habitats here (see above). A total of 29 different bird species were recorded during the bird field surveys.

A summary of conservation status of key species of conservation concern (Lynas *et al*., 2006)[2] noted is as follows:

Species listed on Annex 1 Birds Directive

No species were noted. The site is unsuitable for Peregrine which often breeds in stone quarries. Kingfisher may possibly occur though this would be in wetland areas which will remain undisturbed.

Species of High Conservation Concern (Red listed Bird watch Ireland)

The site attracts Yellowhammer from surrounding farmland. A minimum of 10 were noted and this species also likely breeds in fringing scrub at the site boundary where birds were noted. These habitats will be retained.

Species of Moderate Conservation Concern (Amber listed Bird watch Ireland)

Coot

A pair of coot was noted in wetlands (siltation ponds) on site. These areas will remain undisturbed.

Skylark

A small flock (6+) were noted foraging in grasslands on the site. These areas will be retained.

Sand Marten

[2] Species of conservation concern in Ireland: Lynas P., Newton S.F. & Robinson J.A. 2007. The status of birds in Ireland: an analysis of conservation concern 2008-2013. *Irish Birds* 8 :149-166.

Two colonies are present on the site which following checks could be confirmed as having been active this summer. The larger colony (c.a. 50 burrows) is located at the west of the site at Irish Grid reference O23348 17700. A smaller colony (c.a. 10 burrows) is located at Irish Grid reference O23906 17604. These areas will be retained undisturbed.

Linnet

A large flock of >100 individuals was noted feeding in weeds on the north of the site. Smaller flocks were also scattered over the site. This species is attracted to the site by weeds and scrub vegetation (shelter).

Species not currently of conservation Concern (Green listed species Bird Watch Ireland)

The site is used by a diverse range of common bird species. The following were all noted in varying numbers on site; Pheasant, Blue Tit, Great Tit, Coal Tit, Robin, Wren, Dunnock, Hooded Crow, Jackdaw, Magpie, Rook, Jay, Mistle thrush, Song thrush, Blackbird, Siskin, Goldcrest, Greenfinch, Chaffinch, Grey Wagtail, Meadow pipit, Goldfinch, Wood pigeon and Moorhen.

Discussion

The site attracts flocks of farmland birds from surrounding farmland as scrub, grasslands and woodlands in particular provide an important autumnal source of food and shelter.

The site is locally important for one species of high conservation concern – Yellowhammer. This species is locally common and scrub and hedgerow habitats used for breeding will be retained.

The sand quarry habitat on site is not suitable for nesting Peregrine (listed on Annex 1 Birds Directive). This species often nests in stone quarries with high cliff faces which are not present on site.

Open ground on site is unlikely to be suitable for breeding wader species e.g. Lapwing and Ringed Plover as scrub is encroaching (predator cover) and these areas are unlikely to be extensive enough for secure nesting. They are also subject to flooding.

The status of species of moderate conservation concern and important habitats, with continued waste management activities, are likely to be as follows:

- Sand martin breeding sites will be retained in an undisturbed state within the site.
- Skylark may breed on site in undisturbed grassland which will be retained
- Wetlands and associated waterfowl will be retained
- Nesting habitat for linnet (scrub) will largely be retained

Key habitats on the site for birds are scrub, woodlands and unimproved grasslands. These areas are undisturbed and likely to remain so as the works area consists largely of bare ground, re-colonising bare ground and built ground habitats which are of low importance for birds.

If future clearance works are required in areas of scrub and wetlands during the bird breeding season (late March to end August) then it should be noted that all birds and their nesting places

are protected under the Irish Wildlife Act (1976) and under the Irish Wildlife Amendment Act, (2000). It would be recommended that a breeding bird study be conducted prior to starting these works between (late March and end August) so as to inform regarding requirements to comply with Irish Wildlife legislation.

Conclusion

Ongoing waste management activities are not having a significant negative impact on birds and hence no impact would be expected from future waste management activities to breeding birds.

The undisturbed nature of large areas of the site means that this area is locally important for common passerines bird species including Yellowhammer, and this will likely continue to be the case with ongoing current activities.

To strictly comply with condition item 6.17 of the EPA Waste Licence W0269-01 it is recommended that an updated bird survey be conducted in April/ May 2012 (within breeding bird season). The site may possibly have additional breeding species of conservation concern though impacts are unlikely to arise given current management.

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

Section 20:
Resource use and energy efficiency summary report

Fassaroe
Location Energy Manual

Table of Contents

Scope and Distribution

Confidentiality Statement

This manual is the property of Roadstone Wood Ltd., and its issue is controlled. The information contained herein may not be disclosed, in whole or in part, either verbally or in writing without the prior consent of the Managing Director.

Distribution List

The following have been issued with a complete copy of the Location Energy Manual:-

1	Property Manager
2	Operations Manager
3	Group Energy Management Representative
4	Location Manager

Amendments

Revision No.	Section Amended	Date	Description	Initials
2	All	20/01/10	Updated to EN16001 Standard	SD
3	All	21/07/10	Updated following Audits	KD

Scope of Application

This Manual outlines the requirements for an energy management system at Roadstone Wood Locations.

A series of initiatives have been taken in the past to improve energy management identified throughout the Locations. In order to maintain and improve on the benefits of these initiatives the company decided in 2007 to implement the energy standard I.S. 393 in a number of locations across the group. This Irish Standard specified requirements for an energy management system, to enable an organisation to formulate a policy and objectives taking into account legislative requirements and information about significant impacts on energy consumption and CO_2 production.

Subsequently in July 2009 I.S. EN16001:2009 was released. Roadstone Wood will implement a transition policy for all locations that have successfully achieved accreditation to I.S 393 to achieve certification for EN16001:2009 before July 2010. Roadstone Wood intend to role out the new standard as desired from 2010 onwards.

The Energy Management System covers the quarrying and added value products of Roadstone Wood Locations.

It includes the operations, products and services that have been judged to be significant on the basis of the assessment conducted in the initial energy review and subsequently in accordance with EnMS system document Procedure for Assessing Aspects (EnMS 5).

Process Description

Description of the Company

Roadstone Wood Ltd. is one of the major suppliers of construction aggregates, ready mixed concrete, concrete products, road surfacing materials, agricultural lime and architectural products in Ireland. They are part of a leading international building materials group, Cement Roadstone Holdings (CRH). Headquartered in Belgard Castle, Dublin, Ireland, CRH has over 150 locations across Ireland alone.

CRH is an environmentally responsible organisation and recognises that both energy management and environmental issues present both an existing challenge and a rewarding opportunity for its business operations.

The company is dedicated to the principle of quality, which is reflected in the products it sells and in the systems it uses. The company has been independently assessed and has achieved registration to the International Standards IS EN ISO 9001 and ISO 14001.

Definition of Processes

Ready Mixed Concrete Production - Screened Aggregates produced at the location are used in the production of ready mixed concrete. Cement, sand, water and admixtures are mixed with aggregate to produce ready mixed concrete. This is discharged to special mixer trucks for placement at the customer's site.

Sand & Gravel Extraction - Sand & Gravel is extracted by means of a Dragline and put to one side to allow for natural drainage of water. The excavated material is then processed through a number of screening stages to produce graded aggregates and sand. Depending on the size of gravel excavated, a crushing stage may be introduced to the production process, to reduce the gravel to desired sizes.

Definitions

The following definitions are referred to in this manual and are defined in Section 2 Terms and Definitions of I.S. EN 16001.

2.1
Energy

Electricity, fuel, steam, heat, compressed air and other like media

2.2
Energy Use

Manner of kind of application of energy

2.3
Energy Consumption

Amount of energy used

2.4
Energy Aspect

Element of the organisation's activities, goods or services that can affect energy use or energy consumption

2.5
Energy Factor

Quantifiable and recurrent physical determinant of energy consumption

2.6
Energy Management System

Set of interrelated or interacting elements of and organisation to establish energy policy and objectives and to achieve those objectives

2.7
Energy Target

Detailed energy performance requirement, quantifiable, applicable to the organisation or parts thereof, that arise from the energy objective and that needs to be set and met in order to achieve those objectives

2.8
Energy Policy

Statement by the organisation of its intentions and principles in relation to its overall energy performance which provides a framework for action

2.9
Energy Objectives

Overall energy goal, consistent with the energy policy that the organisation sets itself to achieve

2.10
Energy Efficiency

Ratio between an output of an organisation's activities, goods or services, and an input of energy

2.11
Energy Performance

Measurable result of the organisation's energy management system

2.12
Energy Management Programme

Action plan specifically aimed at achieving energy objectives and targets

2.13
Organisation

Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public pr private, that has its own functions and administration that has the authority to control its energy use and consumption.

2.14
Preventative Action

Action to eliminate the cause of a potential nonconformity

2.15
Corrective Action

Action to eliminate the cause of detected nonconformity

2.16
Continual Improvement

Activities that result in improved energy performance and which are performed continually by the organisation

2.17
Procedure

Specified way to carry out an activity or a process

2.18
Top Management

Person or group of people who, at the highest level, direct and control the organisation

2.19
Document

Information and its supporting medium

2.20
Record

Document stating results achieved or providing evidence of activities performed

2.21
Audit

Systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which the energy management system complies with the criteria set by the organisation.

2.22
Auditor

Person with the competence to conduct and audit

2.23
Nonconformity

Non-fulfilment of a requirement

2.24
Interested Party

Person or group concerned with or affected by the energy performance of the organisation

2.25
Energy Performance Indicator

Ratio chosen by the organisation to monitor energy performance

System Requirements

General Requirements

Roadstone Wood Ltd. are leading producers and suppliers of construction aggregates, road surfacing materials, ready mixed concrete, concrete blocks and milled lime from their site at Fassaroe, Co. Wicklow

This section of the Manual outlines the details of how Roadstone Wood will establish, implement, maintain and continually improve an Energy Management System in accordance with I.S. EN 16001:2009. An overview of the Energy Management System's framework is outlined in Figure 1. Components of the framework are described in the subsequent sections.

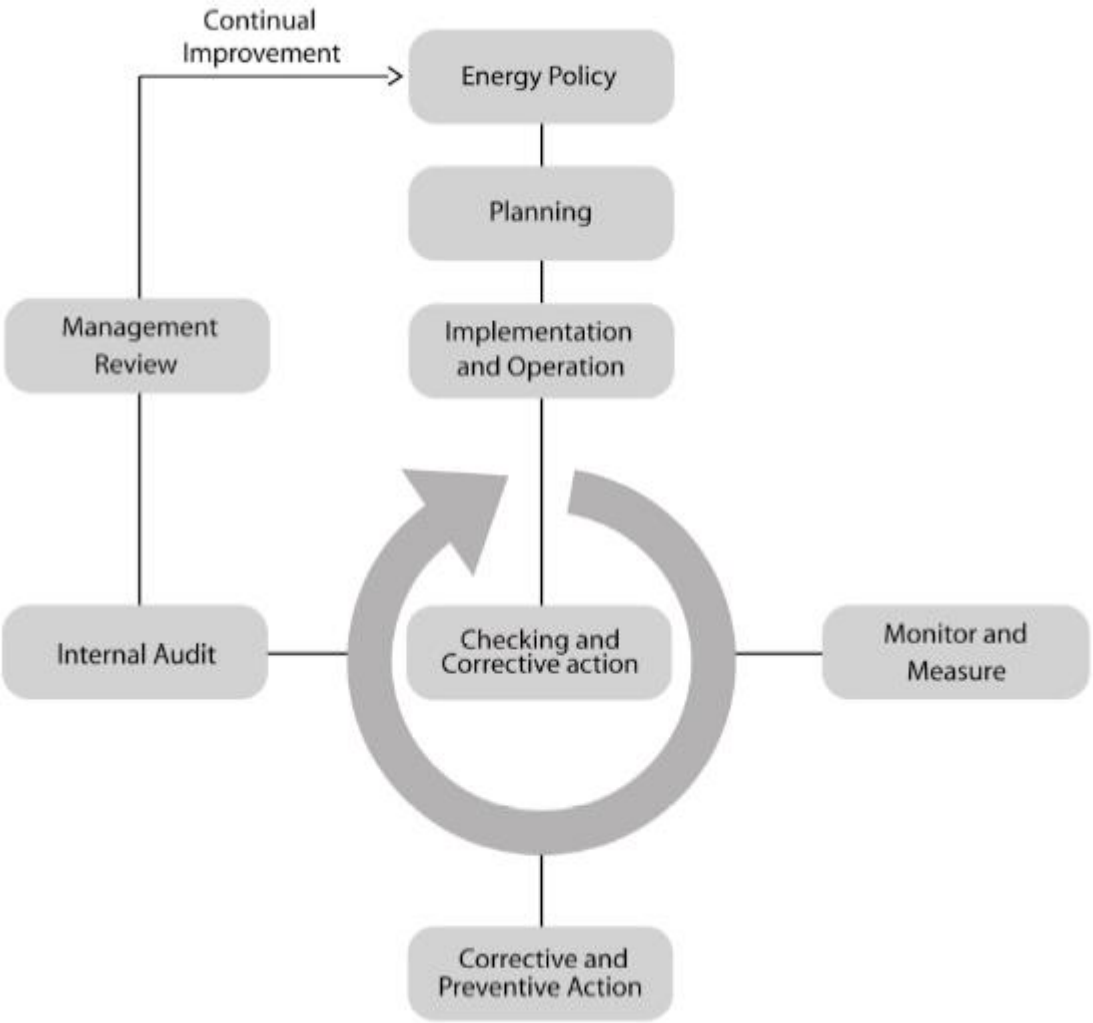

Figure 1 – Energy Management System Model for this Location

Roadstone Ltd
Fortunestown,
Tallaght,
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Energy Policy

Roadstone Ltd. are leading producers and suppliers of construction aggregates, road surfacing materials, ready mixed concrete, concrete blocks and milled lime from their site at Fassaroe Co. Wicklow. Roadstone Wood Ltd. recognises that protection of the environment and responsible energy management is an integral part of its business and therefore endeavors to undertake its activities in an environmentally responsible and energy efficient manner.

Aims:-

- ✓ *Establish implement and maintain an Energy Management System in accordance I.S. EN 16001. The scope of the Energy Management System will include all activities that consume electricity and fuel at* Fassaroe Co. Wicklow
- ✓ *Continually review and improve purchasing, operating, motivation and training practices in relation to energy consumption.*
- ✓ *Invest in energy saving measures and energy management activities.*
- ✓ *Establish and maintain a management information system to ensure that information is delivered to those who need it, on time and in a form which supports their management decision-making.*

***Leonard Grogan* will: -**

- *Comply with applicable environmental and energy related legislation, industry best practice and third party agreements.*
- *Be a good neighbour.*
- *Achieve continuous improvement in environmental performance, pollution prevention, CO_2 emissions and energy efficiency.*

***Leonard Grogan* will actively pursue this policy by: -**

- *Operating an Environmental and an Energy Management System to assist in implementation of this policy.*
- *Improving awareness among Staff and other relative Parties in relation to Environmental and Energy issues.*
- *Setting, Monitoring and Reviewing Environmental and Energy Objectives and Targets by means of Annual Energy Reviews and Management Reviews.*
- *Reducing our dependence on fossil fuels and investing in renewable energy and energy efficient sustainable technologies.*
- *Making available the required resources and information necessary to operate this policy in accordance with BAT (Best Available Technique) principles.*

This Policy will be communicated to all employees and contractors as Roadstone Wood recognises that the successful implementation of this policy depends on the ongoing commitment of all those working in the location.

Leonard Grogan

Date: **Location Manager:**

Planning

Energy Aspects

The identification and review of Energy Aspects and Energy Factors is critical in understanding where energy is used within the organisation and forms the basis for prioritising the efforts to reduce energy consumption. A considerate change to the energy management system is the addition of a focus on energy factors. The following definitions distinguish between the two:

***Energy Aspects**:*
Elements of the organisations activities, products or services that require the consumption of energy, e.g. heating of aggregate in the Asphalt Plant. A significant energy aspect is an aspect which has or can have a significant impact on the consumption of energy. These Energy Aspects are measured with Energy Performance Indicators.

***Energy Factor**:*
Elements of the organisations energy aspects that have an affect on energy consumption of that aspect, e.g. moisture content of the aggregates being heated in the Asphalt Plant. Energy Factors are quantifiable and recurrent physical determinant of energy consumption. These Energy Factors are also measured with Energy Performance Indicators.

The identification of energy aspects and factors takes place as part of the Initial Energy Review (EnMS 04). This is the fundamental cornerstone for establishing and maintaining the energy management system. A register of all the identified aspects and factors is maintained in the Energy Management System Working Folder. The document Procedure for Assessing Aspects (EnMS 05) sets out the criteria for scoring and ranking each of these aspects

A review of the Register of Aspects takes place annually as part of the Annual Energy Review and is the responsibility of the Location Manager to undertake and document. This involves assessing the aspects with regard to their continued relevance, changes to their significance and the addition of new aspects or factors.

This Annual Review will also include:

- review of past and present energy consumption and energy factors based on measurement and other data
- a comparison of actual energy consumption against previous estimates of energy consumption
- identification of significant changes in energy use during the last period
- an estimate of expected energy consumption during the following period
- identification of all persons whose actions may lead to significant changes in energy consumption
- setting of targets and objectives for the following period

The review and ranking of energy aspects and factors is then used as the basis for setting targets and developing Energy Improvement Programmes.
These Annual Reviews should aim to be progressively more detailed in their analysis of energy usage in the Location.

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Reference to Documentation:

- Register of Energy Aspects and Factors (EF 12)
- Initial Energy Review (EnMS 04)

Responsibilities:

- Location Manager
- Location Energy Officer
- Group Energy Management Representative

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Legal Obligations and Other Requirements

Roadstone Wood employs the following methods to identify and have access to legal and other requirements to which the organisation subscribes and that are applicable to the energy aspects of its activities, products and services:

- Relevant Legislation is first identified as part of the Initial Energy Review of the location.
- The Register of Legislation is made available and updated by TMS Consultancy Ltd. via their website (www.registeroflegislation.com). This register will detail all current and proposed legislation, industry codes of practice and particularly legal requirements dealing with identified significant energy impacts
- The determination of how legal obligations apply to the company's activities is achieved through the completion of a questionnaire by the Group Energy Management Representative (GEMR). This questionnaire issued by TMS Consultancy will evaluate the extent to which a particular piece of legislation applies to Roadstone Wood Ltd.
- This evaluation of compliance is updated regularly by the GEMR and issued to the relevant personnel. The compliance to relevant legislation and other requirements is discussed at Management Reviews.
- The master copy of the Register of Legislation will be available via the TMS website www.registeroflegislation.com. The list of the legislation relevant to the location will be filed in the Energy Management System Working Folder and the Location Manager and/or Energy Officer will be responsible for ensuring this is up to date.
- In addition to legal requirements, Roadstone Wood aims to conform and agree to any other requirements that may be relevant to or have a beneficial impact on energy efficiency. These may include best practices or agreements with third parties, such as with Sustainable Energy Ireland.
- It will be the responsibility of the GEMR to keep the Location Manager aware of any new agreements entered into and of how they apply to the location. Additional requirements or agreements will be filed in the Register of Legislation contained in the Energy Management System Working Folder.

Reference to documentation:

- Register of Legislation (EnMS Working Folder)
- Evaluation of Compliance Form (EF/05)
- Annual Management Review (EnMS Working Folder)

Responsibility:

- TMS Consultancy Ltd.
- Group Energy Management Representative
- Location Energy Officer
- Location Manager

Resources required:

- Property Manager.
- Group Energy Management Representative.
- Services of TMS Consultancy and Sustainable Energy Ireland.

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Energy Objectives, Targets and Programmes

Following the assessment or reassessment of both Energy Aspects and Energy Factors, the Location Manager will have a ranked list of significant aspects and factors. It is then the responsibility of the Location Manager to devise objectives and targets for these aspects and factors, and where possible initiate projects or Energy Improvement Programmes to reduce energy consumption or improve energy efficiency.d4

There are two categories of objectives and targets that need to be set as part of the Energy Management System. The first is for the data monitored and measured through MaPS, and the second is for the Energy Performance Indicators relevant to the Energy Improvement Programmes being under taken at the location.

Data obtained over the course of the year is reviewed as part of the Annual Energy Review by the Location Manager and/or the Energy Officer. Objectives and targets are then set for the forthcoming year, documented in the Monitoring and Measuring Plan and entered on MaPS.

During the initial stages of Energy Improvement Programmes, specific objectives and targets are set by the Location Manager and/or the Energy Officer. These must include target values for energy use, responsibilities and time frames, and are documented on the relevant Energy Improvement Programme Cover Form (EF/07).

Objectives and Targets will be set to reduce or eliminate the impact of each aspect or energy factor dealt with. Targets chosen will be ambitious, so as to commit the organization to continual improvement, realistic so that they can be achieved within the specified time limits, specific and measurable. All targets will be measured in terms of the associated Energy Performance Indicators.

On occasions, the assessment and setting of these objectives and targets may involve input from the Group Energy Management Representative and/or the Performance Managers.

The data being monitored and measured on MaPS will be continuously assessed and reviewed by the Group Energy Management Representative (GEMR). Any non conformances will be raised by the GEMR and dealt with as per the Procedure for Non-Conformance, Corrective and Preventative Action (EnMS 14).

All data and results will be monitored and reviewed on a site level by the Location Manager and/or Energy Officer by means of the Location Energy Meetings.

Reference to documentation:

- Procedure for Monitoring and Measuring (EnMS 13)
- Procedure for Control of Records (EnMS 15)
- Annual Energy Review (EnMS Working Folder)
- Location Energy Meetings (EnMS Working Folder)
- Monitoring and Measuring Plan (EnMS Working Folder)
- Energy Improvement Programme Cover Form (EF/07)

Responsibilities:

- Location Manager
- Location Energy Officer
- Group Energy Management Representative

Resources required:

- The resources that are required for achieving the objectives and targets are identified under the relevant energy management improvement programs.
- Environmental Officer
- The Property Manager and Energy Officer

Implementation and operation

Resources, roles, responsibility and authority

Roles, responsibilities and authorities are defined and documented throughout this site energy manual. Individual duties and responsibilities are outlined in Appendix A.

The Managing Director has overall responsibility for fostering a sense of energy management awareness amongst both direct and indirect staff. The Managing Director (in conjunction with his management team) is responsible for ensuring the availability of resources essential to establish, implement, maintain and improve the Energy Management System. Resources include human resources, specialised skills, technology and financial resources.

The Property Manager decides in conjunction with the Group Energy Management Representative what forms of external communication will take place if any.

The Group Energy Management Representative (GEMR) plays a central role in the establishment, implementation and maintenance of the Energy Management System (EnMS). His responsibilities include:

- Report on the performance of the Energy Management System to the Property Manager for their review, with recommendations for improvement.
- Discuss assessment of energy aspects with location managers
- Complete TMS questionnaire when new legislation is published.
- Review compliance with Legislation frequently and notify Locations of this review.
- Notify Locations of any agreements with third parties and of how it affects them.
- Communicate with locations with regard to their training and awareness requirements and develop a training schedule for the forthcoming year to serve these requirements.
- To ensure that each level of management, both above and below them, are informed and appropriately trained in the field of energy management.
- Circulate Energy Case Studies around the various locations.
- Summarise all external communications received in locations for the Property Manager.
- Generate, update and maintain all Energy Management System documentation, and notify relevant personnel of any changes to the system.
- Identify and raise non-conformances resulting from monitoring data on MaPS, notify Location Managers of such and verify that follow-up action is complete.
- Record the minutes of Annual Energy Management Reviews.

The Location Manager and Energy Officer hold a lot of responsibilities for the day to day running of the EnMS at their location. These responsibilities include:

- Assess energy Aspects annually
- Discuss the Register of Aspects with Location Manager and set targets and objectives for the associated energy factors.

- Identify the training and awareness requirements of new and existing employees during Location Energy Meetings and communicate these needs to the Group Energy Management Representative.
- Carry out the awareness campaigns in their location as per instructions from the Group Energy Management Representative.
- Develop site specific awareness campaigns as required.
- Maintain the Locations Energy Competency Matrix and the appropriate records in the Locations training file.
- Maintain the Locations Energy Notice Board with information on Improvement Programmes and data from MaPS.
- Record opportunities raised in the Register of Opportunities.
- Recording and documenting the minutes of Location Energy Meetings.
- Complete the annual Energy Performance Report and Monitoring and Measuring Plan for the forthcoming year and communicate these to the Group Energy Management Representative.
- Submit suggestions or ideas for the improvement of the Energy Management System to the Group Energy Management Representative.
- Generate Location specific documents as necessary.
- Document all non-conformances in the Energy Management System Working Folder, take the necessary action to deal with the non-conformances, and notify the relevant person when the issue is closed off.

All employees and contractors have a responsibility to comply with specified energy management procedures. They should also inform management of any issues of energy demand significance that they notice e.g. compressors operating inefficiently, motors running when not required, lights and heating on when not required etc.

Reference to Documentation:

- Energy Policy (EnMS 1 and EnMS 2)
- Non-Conformance, Corrective and Preventive Incident Report Form
- Energy Training and Competency Matrix (EF 09)
- Energy Case Studies (EnMS Working Folder)
- Register of Opportunities (EF 03 EnMS Working Folder)
- Location Energy Meeting Minutes (EF 02)
- Register of Legislation (EnMS Working Folder)

Responsibilities:

- Managing Director
- Group Energy Management Representative
- Location Manager
- Location Energy Officer
- Employees
- Contractors
- Sustainable Energy Ireland
- External Auditor
- Internal Auditor

- TMS Consultancy Ltd.

Resources Required:

- Senior Management commitment
- Human resources
- Input and cooperation from SEI and external auditors
- Contract with TMS Consultancy Ltd.

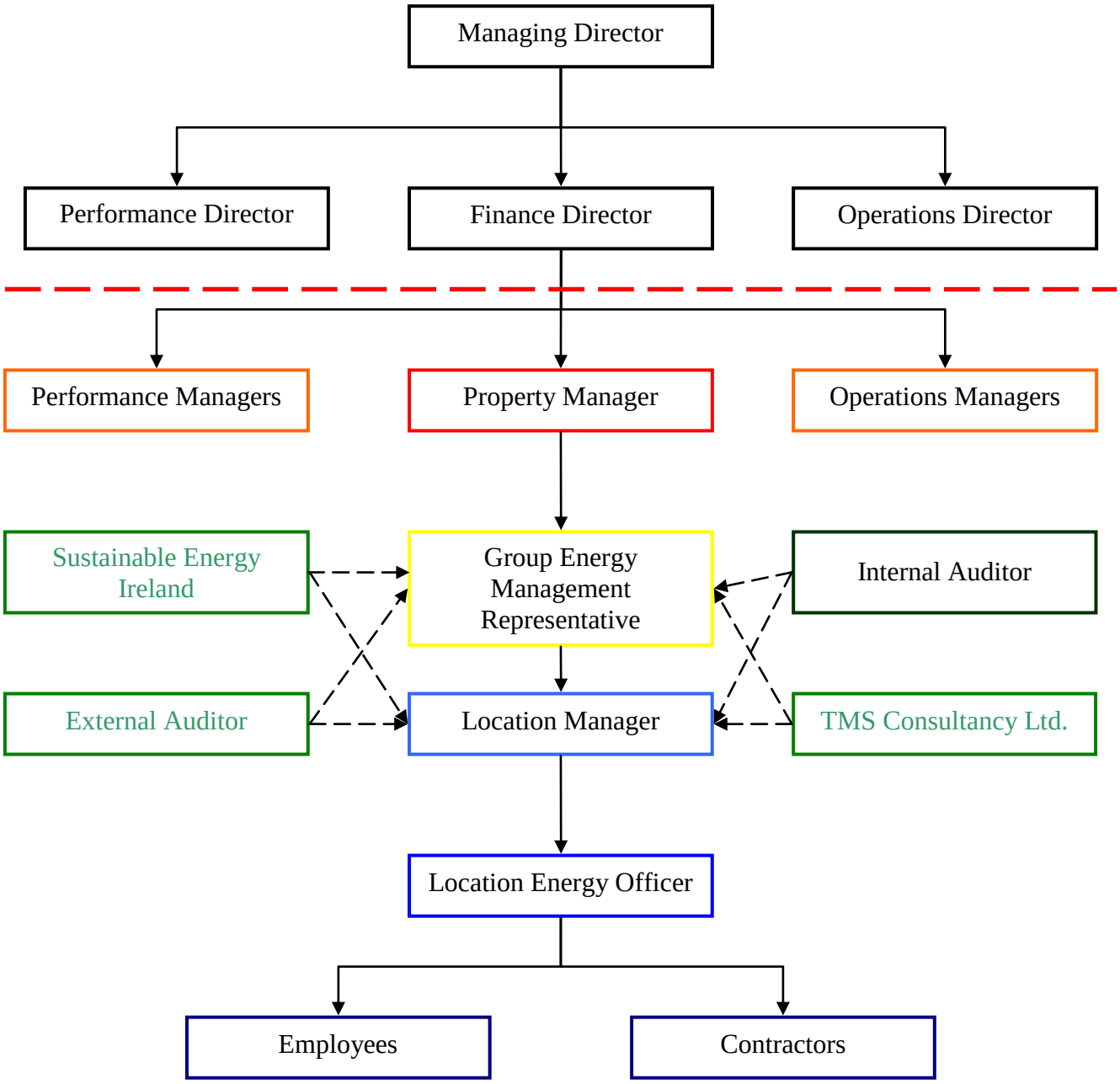

Figure 2 – Group Organisational Structure

Training, Awareness and Competence

Energy awareness plays a key role in helping to achieve the objectives and targets established as part of the energy management system. All location employees shall be made aware of:

- The locations energy policy and energy management programmes;
- The energy management system requirements, including the activities of the location and organisation to control energy use and improve energy performance;
- The impact, actual or potential, with respect to energy consumption, of their activities and how their activities and behaviour contribute to the achievement of energy objectives and targets;
- Their roles and responsibilities in achieving the requirements of the energy management systems;
- The benefits of improved energy efficiency.

This is achieved through general energy awareness training at all locations. The Group Energy Management Representative (GEMR) is responsible for developing an annual schedule of general energy awareness training for all locations (EF 08). This will include regular energy awareness campaigns and annual energy awareness talks at each location. General energy awareness campaigns will be based on a variety of means including, but not limited to; posters, notice boards, seminars and talks. The GEMR is responsible for the compilation and dissemination of energy awareness material to all locations, developing and delivering energy awareness talks and seminars. Each location Manager is responsible for providing specific input into the energy awareness material as requested by the GMER and for implementing all awareness material at the location, ensuring that all relevant employees attend energy awareness sessions and compiling/maintaining energy training records (EF 09 and Location Training Files).

Those persons identified in the Location Initial Energy Review (EnMS 04) and then during the Annual Energy Review whose job has a potential to significantly impact the energy use at the location, are required to be appropriately trained and competent to carry out their role in an energy efficient manner. Specific training may include, but not limited to; a review of location operating procedures/industry best practices, on the job training/mentoring, attendance at external or internal seminars/workshops.

The Group Energy Management Representative is responsible for ensuring that each level of management, both above and below the GEMR, are informed and appropriately trained in the field of energy management.

The level of management to be covered extends to one tier above the GEMR as per the company structure (EnMS 08) and includes the Property Manager, Performance Managers and Operations Managers.

Management training will take the form of energy seminars, conferences and energy workshops organised and/or delivered by the GEMR as per the Audit and Awareness Schedule.

Reference to Documentation

- Energy Policy (EnMS 01 and EnMS 02)

- Energy Improvement Programmes – EnMS Working Folder (EF 07)
- Awareness Schedule – EnMS Working Folder (EF 08)
- Energy Training and Competency Matrix – EnMS Working Folder (EF 09)
- Initial Energy Review (EnMS 04)
- Roles and Responsibilities (EnMS 08)
- Location Energy Meetings – (EnMS Working Folder)

Responsibilities:

- Location Manager
- Group Energy Management Representative
- Location Energy Officer

Resources required:

- Input from the Location Manager, Environmental Officers and Energy Officer.
- Training room and relevant equipment
- Time to be made available for all staff and relevant contractors to be trained as per the training plan.

Communication

Effective handling of all communications with regard to energy aspects and the EnMS is essential.

Communication can be broken down to two levels:

- Internal communications between the various levels and functions of the location
- Receiving, documenting and responding to relevant communication from external interested parties.

Internal Communication

The provision of relevant and regular information on the energy management system contributes to motivating and committing employees to comply with the organisations Energy Policy and take an active part in achieving the organisations energy objectives and targets. Internal communication will focus on and include the following issues:

- *Policy* – Communicated to all employees during energy awareness training, to contractors during site induction and displayed on notice boards for all visitors.

- *Non-conformances* – Each non-conformance must be documented on the Non-Conformance, Preventative and Corrective Action Incident Report Form and dealt with as per the Procedure for Non-Conformance, Preventative and Corrective Action (EnMS 14). The Location Manager must be notified; the non-conformance filed in the Energy Management System Working Folder, and then discussed at Location Energy Meetings. Once the required action has taken place and the non-conformance closed out, the GEMR is notified in order to verify the closing out of the non-conformance and to update his own records on the Q Data File.

- *Objectives & Targets* – Once decided upon by the Location Manager and Location Energy Officer, objectives and targets are documented in their corresponding Energy Improvement Programme Cover Sheet (EF 07). Summaries of programmes and their objectives and targets are displayed on notice boards for all employees and visitors to see by the Location Energy Officer or Location Manager.

- *Opportunities* – A Register of Opportunities (EF 03) is maintained in the Energy Management System Working Folder. All employees are encouraged to communicate directly to management regarding energy management concerns, ideas or opportunities. All opportunities must be correctly documented on the Register of Opportunities Form (EF 03) and filed in the register by the Location Energy Officer.

- *Information & Performance* – Poster campaigns are held annually and location notice boards used to inform employees of various energy related issues, and of location and company energy performance based on MaPS data. This is the responsibility of the GEMR to provide the required information material to each Location. The Location Manager and Location Energy Officer regularly attend seminars, best practice meetings and continual improvement meetings held within the CRH group. Energy Case Studies documenting details of Energy Improvement Programmes of other

locations within the group are used to circulate information on successful projects from one location to another. This is the responsibility of the Group Energy Management Representative.

- *Compliance* – Notice boards will be used to display information on legal obligations and other agreements that the organisation subscribes to. New legislation, once identified by the Group Energy Management Representative, will be communicated to the relevant personnel via electronic mail and the TMS Consultancy website. This will be done as per the Procedure for the Evaluation of Legal and Other Requirements (EnMS 06) and the Evaluation of Compliance Form (EF 05).

- *Benefits* – Posters, notice boards, training sessions and the company magazine "Screenings" will be used to raise awareness of the financial, environmental and social benefits of efficient energy usage.

- *Further Information* – All employees, through training, awareness schemes and notice boards must be made aware of persons they may contact for further information, details or to whom they can offer thoughts or ideas on energy matters to.

Location Energy Meetings are held on a quarterly basis in each location to discuss all of the above issues. Minutes of these meetings will be maintained in the locations Energy Management System Working Folder on the Location Energy Meeting Record Form (EF 02). The Location Energy Officer is responsible for ensuring sufficient notes of these meetings are kept and filed.

An annual Energy Performance Review will be complied by the Location Manager and Location Energy Officer. This will be documented and sent to the Group Energy Management Representative via electronic mail and will summarise the performance of the Energy Management System during the previous year and will include estimates of the following years energy usage.

External Communication

The Location Manager will document a record of all external communications relevant to the Energy Management System. The Group Energy Management Representative shall build up a profile of the types of communications being received. It is the responsibility of the Group Energy Management Representative to summarise these communications and the actions taken for the Property Manager. Energy Management information for individual locations will not be communicated externally however the Property Manager or Group Energy Management Representative may communicate through the SEI or similar bodies information in accordance with relevant awareness campaigns . The means of this external communication may take which ever form the Property Manager deems appropriate. These may however include electronic mail, providing written documents, verbal conversations, questionnaires or delivering presentations.

Reference to Documentation:

- Energy Policy (EnMS 01 and EnMS 02)
- Non – Conformance, Preventative and Corrective Action Incident Report Form
- Procedure for Non-Conformance, Preventative and Corrective Action (EnMS 14)
- Location Energy Meetings

- Evaluation of Compliance (EF 05)
- Energy Improvement Programmes (EnMS Working Folder)
- Register of Opportunities Form (EF03)
- Energy Case Studies (EnMS Working Folder)
- Annual Energy Review (EnMS Working Folder)

Responsibilities:

- Location Manager
- Location Energy Officer
- Group Energy Management Representative
- Property Manager

Resources required:

- Group Energy Management Representative and Location Managers time for handling the communications. Input from Location Energy Office and the Property Manager.

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Energy Management System Documentation

The Energy Management System Location Energy Manual (this document) details the core elements of the EnMS. It is designed to provide a signpost to other documents that form the locations EnMS and is located in the Locations EnMS System Folder.

The Group Energy Management Representative (GEMR) is responsible for maintaining the documents that make up the Energy Management System and for distributing copies to the relevant personnel as appropriate. Master copies of each document will be maintained in electronic format on the company shared drive and hard copies maintained in each locations Energy Management System Folder.

Each Location Manager is responsible for maintaining the locations EnMS Working Folder and the Energy Improvement Programme Folders.

Reference to documentation:

- Site Specific Manual
- Location Managers individual EnMS folders
- Associated energy records

Responsibility:

The Energy Management Representative unless otherwise stated in the Location Manual has responsibility for reviewing the documentation for the Site EnMS.

The Location Manager has responsibility for maintaining the Location EnMS Site Folder

Resources required:

- Locations manager time to work on the EnMS documentation.

Document Control

All documents relating to the Energy Management System must be kept and maintained in such a way that they are easily accessible and protected against damage, loss or destruction. Each document must contain the following information:

- Document title.
- Revision Number.
- Revision Date.
- Who approved the document or amendment.

Each location must hold on file a copy of the current version of all documentation that relates to that location. The list of documentation relevant to the locations Energy Management System will be listed in the Master List of Documents as part of the Energy Management System Folder. It is the responsibility of the Group Energy Management Representative (GEMR) to ascertain when new documentation must be developed. Location Managers or Location Energy Officers may at any time suggest or recommend the generation of new documentation to the GEMR. However, documentation must not be created without the knowledge and full participation of the GEMR.

Each new document will be furnished with the required information listed previously. Master copies of new documents are retained on the company's shared drive and are accessible to all relevant employees. Each newly generated document will be communicated to the relevant personnel via electronic mail by the GEMR. It is then the Location Energy Officers responsibility to update the Energy Management System appropriately.

Energy Management System documents are reviewed by means of discussion during Energy Management Meetings. This discussion centres on the performance and the continued relevance of the system to the location operations. The overall adequacy of Energy Management System documentation will be reviewed annually by the Group Energy Management Representative and updated accordingly.

When a document is superseded it should still be retained for knowledge or future legal requirements. Before discarding or filing of the obsolete document, its revision number must indicate that it is now obsolete. Once replaced or discarded a paper copy will be held in the an obsolete documentation section of the working folder for a period of five years. The list of documentation relevant to the location EnMS will be listed in the Master List of Documents (EMS/03) in the EnMS Site Folder.

Reference to Documentation:

- Master List of Documents (EnMS 03)
- Energy Management Meetings Minutes

Responsibilities:

- Group Energy Management Representative
- Location Manager
- Location Energy Officer

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Document Name	Document Number	Rev Number	Date
Energy Policy – Company	EnMS 01	0	3/3/10
Energy Policy - Location	EnMS 02	0	3/3/10
Master List of Documents	EnMS 03	0	3/3/10
Initial Energy Review	EnMS 04	0	3/3/10
Procedure for Assessing Aspects	EnMS 05	1	21/7/10
Procedure for Evaluating Legal and Other Requirements	EnMS 06	0	3/3/10
Procedure for Setting Energy Objectives and Targets	EnMS 07	1	21/7/10
Resources, Roles, Responsibility and Authority	EnMS 08	0	3/3/10
Procedure for Training, Awareness and Competency	EnMS 09	0	3/3/10
Procedure for Communication	EnMS 10	1	21/7/10
Procedure for the Control of Documents	EnMS 11	0	3/3/10
Standard Operating Procedures	EnMS 12	0	3/3/10
Procedure for Monitoring and Measurement	EnMS 13	0	3/3/10
Procedure for Non-Conformances	EnMS 14	0	3/3/10
Procedure for the Control of Records	EnMS 15	0	3/3/10
Procedure for Internal Audits	EnMS 16	0	3/3/10
Procedure for Management Reviews	EnMS 17	0	3/3/10
Procedure for Purchasing	EnMS 18	0	3/3/10
Energy Manual	EnMS 19	0	21/7/10
Register of Opportunities Form	EF/03	0	3/3/10
Internal Audit Form	EF/04	0	3/3/10
Evaluation of Compliance Form	EF/05	0	3/3/10
Purchasing Assessment Form	EF/06	0	3/3/10
Energy Improvement Programme Form	EF/07	0	3/3/10
Auditing, Awareness & Training Schedule	EF/08	0	3/3/10
Energy Training & Competency Matrix	EF/09	0	3/3/10
Assessment of Aspects and Factors	EF/12	0	3/3/10

Operational Control

The Energy Management System Site Manual (EnMS19) details the core elements of the EnMS. It is designed to provide a signpost to other documents that form the location's EnMS and is located in the Location EnMS Site Folder.

In order to fulfil the requirements of its energy policy and meet its objectives and targets, Roadstone Wood has evaluated operations that are associated with its identified significant energy aspects and to ensure they are conducted in a way that will control and reduce their energy consumption.

Standard Operating Procedures (EnMS 12) are in place in each location that detail the way in which plant, equipment and facilities should be operated and managed in an energy conscious way. These SOPs will include activities such as air compressor operation, water pump operation, crushing plant operations and concrete plant operations.

Roadstone Wood has also implemented a Procedure for Purchasing (EnMS 18) as an operational control in order to improve energy conscious procurement. When procurement has the potential to impact to a significant degree on the significant energy consumption, then energy efficiency should become part of the evaluation criteria. This procedure will apply to all locations operating this EnMS and must be considered when purchasing machinery, equipment, raw material and services. Records of this assessment are filled in the EnMS Working Folder on the Purchasing Assessment Form (EF 06).

Location Managers are responsible for implementing these Operating Procedures and ensuring that they reflect the operations and activities in their location. The Group Energy Management Representative is responsible for ensuring that Purchasing Procedures are followed, energy efficient equipment is purchased and ACA scheme is availed of wherever possible.

Reference to Documentation:

- Location Energy Manual (EnMS 19)
- Standard Operating Procedures (EnMS 12)
- Procedure for Purchasing (EnMS 18)
- Purchasing Assessment Form (EF 06)

Responsibilities:

- Location Manager
- Group Energy Management Representative

Checking

Monitoring and Measurement

A critical part of the Energy Management System is the ability to accurately measure energy consumption. Monitoring and measurement should be appropriate to the needs of the organisation and should facilitate the analysis of energy consumption within a site.

The most useful way of monitoring energy consumption is to relate it to a quantifiable output. This is done through the use of Energy Performance Indicators (EPIs). EPIs for each location have been identified in the Initial Energy Review and through the Register of Aspects and Factors, and may differ from location to location.

These EPIs may change from year to year with new ones being created and old ones being discarded. This is done during the Annual Energy Review by the Location Manager and Energy Officer when updating the Monitoring and Metering Plan but may include input from the Group Energy Management Representative (GEMR) or Performance Managers.

Target EPI values are set along with upper control limits and lower control limits where necessary. These values are chosen by the Location Manager following discussion with the companies Performance Managers and/or the GEMR. It is the responsibility of the Location Manager to provide these agreed targets and limits to the Performance Managers to be entered into MaPS. The Location Manager is then responsible for ensuring that measured data is entered into MaPS in a timely fashion.

From time to time the need may arise to monitor EPIs for a particular factor that a location wishes to investigate that may not be in MaPS. In this instance, it is the responsibility of the Location Manager or Energy Officer to maintain a spreadsheet on which the data will be recorded.

The interval of monitoring and measurement of energy consumption needs to be assessed and evaluated at a frequency that allows the deterioration of energy efficiency to be detected, investigated and rectified. This is done by assessing the likelihood of an energy factors consumption exceeding its control limits versus the severity of the consequences of that event happening.

There a three types of Energy Performance Indicator comparisons that are performed as part of this Energy Management System.

This first is to compare actual energy consumption to the expected energy consumption of each aspect/factor. This is done continuously by the Location Manager/Energy Officer and the GEMR through MaPS. This comparison is also performed each year as part of the Annual Energy Review.

Benchmarking is the second form and compares measured energy consumption from one location to the energy consumption of other Roadstone Wood locations. This will be done via the MaPS system and through its Monthly Management and Monthly Director reports by the GEMR and the Location Manager. Because of monthly and weekly inputs of data, comparisons can be made on a weekly and monthly basis.

The final form of comparison is with regard to Energy Improvement Programmes. Actual measured values for EPIs are compared to the objectives and targets set for the particular Energy Improvement Programme. This is done by the Location Manager and/or Energy Officer at Location Energy Meetings.

Reference to Documentation:

- Annual Energy Review (EnMS Working Folder)
- Procedure for Non-Conformance, Preventative and Corrective Action Incident Report Form
- Monitoring and Metering Plan (Working Folder)

Responsibilities:

- Location Manager
- Location Energy Officer
- Group Energy Management Representative
- Performance Managers

Resources required:

- Time for location managers to prepare their monitoring, measurement and performance reports
- Funding for external monitoring companies to carry out monitoring and measurement
- Input from the GEMR

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Evaluation of Compliance

The determination of how legal obligations apply to the company's activities is achieved through the completion of a questionnaire by the Group Energy Management Representative. This questionnaire, issued by TMS Consultancy will evaluate the extent to which a particular piece of legislation applies to Roadstone Wood Ltd.

The TMS website allows for the frequent evaluation of compliance. This is viewed regularly by the Group Energy Management Representative and a summary sheet (EF/05) sent to the Location Energy Officer who files it in the Energy Management System Working Folder. This summary sheet provides the name of the piece of legislation, the implications for Roadstone Wood and a summary of the necessary or current compliance activity.

Compliance with legal and other requirements shall be reviewed annually during the Management Review.

Reference to Documentation:
- Evaluation of Compliance Form (EF/05)
- Annual Management Review (EnMS Working Folder)

Responsibilities:
- TMS Consultancy Ltd.
- Group Energy Management Representative
- Location Energy Officer
- Location Manager

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Nonconformity, corrective action and preventative action

Non – Conformances exist when Roadstone Wood Ltd's and/or the Locations Energy Policy, objectives, targets, programmes, MaPS, EPIs or documented procedures are not complied with.

Roadstone Wood Ltd has identified three main types of non-conformances that can be raised as part of each locations Energy Management System, each of which shall be dealt with and managed differently. These are:

- EPI/monitoring data non conformances (i.e. MaPS data)
- Improvement Programme non-conformances (i.e. meetings, project reviews)
- Energy Management System non-conformances (i.e. Internal Audits)

All non-conformances, corrective/preventive actions, responsibilities and timescales are recorded by the Location Energy Manager or Energy Officer on the Incident Report Form for submission to the GEMR for review and approval. The incident Report records shall be filed in the locations EnMS Working Folder.

The GEMR is responsible for reviewing, assessing and analysing each locations monthly MaPS data, EPIs, and for identifying any non conformances in relation to the Locations target EPIs.

Where the GEMR identifies a non-conformance at a location, he will raise a non conformance on the Incident Report Form and issue it to the Location Manager for action. The GEMR will record the following information on the Incident Report Form prior to submission to the Location Manager;

- Date
- Location
- Raised by
- Source of non conformance (e.g. MaPS data, area, month etc)
- Description of the non conformance

Upon receipt of a non conformance notification from the GEMR, the Location Manager or Energy Officer shall take immediate action to investigate the non conformance. Within 1 week of the report being issued by the GEMR, the Location Manager or Energy Officer shall document the following information on the form:

- Root cause/investigation
- Corrective actions
- Preventive action (if required)
- Reference
- Responsibility
- Proposed completion date (to address and close out the finding)

The Location Manager or Energy Officer is then responsible for managing the implementation of the required actions within the specified timescale.

Once completed, the Location Manager is solely responsible for signing off all closed non-conformances and completing the following remaining sections of the form.

- Actual completion date
- Managers signature (on closure)

Non-conformance record is then sent via paper mail or electronic mail to the GEMR for verification.

Once verified, the GEMR will complete the following remaining sections of the Form.

- Verification date
- GEMRs signature (on verification)

Incident report records shall be filed in locations Energy Management System Working Folder.

The GEMR will compile a log of all non-conformances on the Q Data File and is responsible for ensuring that this procedure is followed. The GEMR or designate will, at agreed intervals carry out verification audits at each relevant location to ensure that the agreed corrective and preventive actions have been adequately and successfully implemented and closed out.

The GEMR will compile an annual report of the nature and status of non conformances for discussion and review at the annual Energy Management Review Meetings as per the Procedure for Management Reviews (EnMS 18).

Flow charts summarising how the key non conformances are identified and managed are shown in Appendix B

Reference to Documentation:

- Non-Conformance, Corrective and Preventive Action Incident Report Form
- Non Conformance Log (EF10)
- Location Energy Meetings Minutes
- Procedure for Monitoring & Measurement (EnMS 13)

Responsibilities:

- Group Energy Management Representative
- Location Manager
- Location Energy Officer

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Control of Records

Energy Management records shall be maintained to substantiate that the required targets are being met and that the location can demonstrate continuous improvement, increased competence and awareness and that the operation of the Management System is effective. The position and manner of storing records may vary from site to site; the following however are general recommendations on how and where records relating to the Energy Management System should be stored.

- Monitoring and Measurement records will be documented in the Energy Management System Working Folder and through MaPS. These will consist of graphs, tables and charts of monitored energy consumption.
- Relevant laws, regulations and other requirements will be stored in the Register of Legislation in the Energy Management System Working Folder.
- Training records will be maintained in the Locations Training file. No specific form exists for energy training, but records will consist of training certificates, attendance sheets, or training day or workshop agendas.
- Maintenance records will be maintained in each Locations Maintenance File or Folder.
- Records of Awareness schemes will be maintained in the locations Energy Management System Working Folder.
- Communication records such as Location Energy Meetings, Best Practice Recommendations and changes of legislation or the system are all maintained in the Energy Management System Working Folder.
- All non-conformance records are to be maintained in the Energy Management Working Folder.
- Suggested opportunities for improvements in energy efficiency are recorded via the Register of Opportunities that is maintained in the Energy Management System Working Folder.
- Minutes of Annual Management Reviews are filed in the Energy Management System Working Folder of the relevant locations.
- All audit reports, both internal and external are kept in the Energy Management System Working Folder.
- Records of electrical bills are to be maintained in the Energy Management System Working Folder. Where available, these bills may be stored on the utility providers' website.
- Registers of Aspects and the Assessment of Aspects are re-evaluated on an annual basis and are recorded in the Energy Management System Working Folder.

The responsibility for maintaining these records is apportioned as per the relevant procedures.

Reference to Documentation

- Register of Legislation (EnMS Working Folder)
- Location Energy Meetings (EF 02)
- Register of Opportunities (EF 03)
- Annual Management Review (EnMS Working Folder)

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Internal audit of the energy management system

An Energy Management System internal audit is an independent review of part or all of the System. The purpose of the internal audit is to determine if the plans, activities and procedures described in the management system are being conducted in the manner that the system requires. Further information for both the auditor and auditee is available in the SEI Internal Audit Guide.

The requirements for an internal auditor are that they are competent to perform the audit and that they are independent from the location being audited.

In order to be competent, Roadstone Wood Ltd has determined that the internal auditor must have reasonable experience and technical understanding of:

- The Energy Management System
- I.S EN 16001 Standard
- Internal Auditing Processes & Procedures
- The processes to be examined

To be suitably independent, the auditor must not have direct involvement in the management of the locations' system, or be based at the location being audited.

The internal auditor must also have experience and knowledge of know how to conduct internal audits. This expertise will be developed through a combination of training (internal and/or external) and experience of observing, participating in, and leading audits. Detailed steps and tips for performing an Energy Management System audit are available in the SEI Internal Audit Guide.

Roadstone Wood has identified three forms of audits that need to take place. These are:

- Compliance Audits – A review of the Energy Management System
- Process Audits – A review of Operating Processes of a site
- Performance Audits – Access actual performance compared to objectives and targets

The Group Energy Management Representative is responsible for establishing an annual internal audit schedule for each relevant Roadstone Wood location (EF 08). Each location and relevant activities will be audited at least annually under each of the 3 scopes of audits, namely a compliance audit, a process audit and a performance audit. The Group Energy Management Representative is responsible for informing each location manager of an impending audit and confirming the audit date. The internal audit will be carried out by the Group Energy Management Representative or somebody designated to carry out the internal audit on his behalf.

Internal Audit Report Form (EF/04) must be completed by the Auditor for each internal audit that is carried out. The report will detail;

- Audit date
- Audit location
- Audit type

- Audit Reference Number
- Auditor
- Finding reference
- Area/system clause
- Description of the finding
- Category

All internal audit findings shall be agreed between the GEMR or designate with the Location Manager at the end of the audit and prior to the GEMR issuing the final report.

The GEMR will provide all location managers with a final Internal Audit Report (EF/04) and copies of the audit trail forms. The Location Manager shall file these reports in the locations Energy Management System Working Folder.

Based on the findings of the internal audit report, the Location Manager or Energy Officer shall record each internal audit non conformance raised in the Internal Audit Report Form (EF/04) on form a Non-Conformance Form (EF/01) as per the Procedure for Non-conformance, Corrective and Preventive Action (EnMS 15).

Each internal audit non-conformance, finding or recommendation must be recorded on form (EF/01) to include the following details;

- Date
- Location
- Raised by
- Source of non conformance (eg. internal audit report ref)
- Description of the non conformance
- Root cause/investigation
- Corrective actions
- Preventive action (if required)
- Reference
- Responsibility
- Proposed completion date (to address and close out the finding)

The Location Manager or Energy Officer shall then manage and implement the required actions, ensuring an adequate investigation takes place, corrective actions performed and preventative measures put in place to prevent the reoccurrence of the non-conformance.

Once completed, the Location Manager is solely responsible for signing off all closed non-conformances and completing the following remaining sections of EF/01.

- Actual completion date
- Managers signature (on closure)

EF/01 records shall be filed in the locations Energy Management System Working Folder. This is the responsibility of the Location Manager and/or the Energy Officer.
Reference to Documentation:

- SEI Internal Audit Guide
- Internal Audit Report Form (EF/04)
- Non-Conformance, Corrective and Preventative Action Incident Report Form
- Procedure for Non-Conformance, Corrective and Preventative Action (EnMS 14)
- Audit and Awareness Schedule (EF 08)

Responsibilities:

- Group Energy Management Representative
- Location Manager
- Location Energy Officer

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Review of the energy management system by top management

A Management Review will be held each year to review the organisations energy management system to ensure continuing suitability, adequacy and effectiveness.
Those required to attend this review include the Property Manager, Performance Managers, Operations Managers and Group Energy Management Representative.

This annual energy review should include specific inputs and outputs, described as follows.

Inputs to the Management Review

Inputs to the Management Review will include;

a. Follow-up actions from previous management reviews;
b. Review of energy aspects and the energy policy;
c. Evaluation of legal compliance and changes in legal obligations and other requirements to which the organisation subscribes;
d. The extent to which the energy objectives and targets have been met;
e. Energy management system audit results;
f. Status of corrective and preventative actions;
g. The overall energy performance of the organisation;
h. Projected energy consumption for the following period;
i. Recommendations for improvement.

Outputs from the Management Review

Outputs from the Management Review will include any decisions are actions related to;

a. The improvement in energy performance of the location following the last review
b. Changes to the Energy Policy
c. Changes to objectives, targets or other elements of the management system for energy consistent with the locations commitment to continual improvement
d. Allocation of resources

The recommendations for improvements shall include any new energy savings initiatives or projects. It shall also address the need for any new Energy Performance Indicators or to refine existing Indicators.

Records

Minutes of the meeting and any follow-up actions will be documented and recorded by the Group Energy Management Representative and filled in the Energy Management System Working Folder in each location.

Reference to Documentation:

- Management Review Meeting Minutes (EnMS Working Folder)
- Energy Policy (EnMS 01 and EnMS 02)

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Responsibilities:

- Location Manager
- Location Energy Officer
- Group Energy Management Representative
- Property Manager
- Performance Managers
- Operations Managers

Appendix A

Managing Director

- Establish, implement and maintain an Energy Policy for the organisation.
- The overall responsibility for fostering a sense of energy management awareness amongst both direct and indirect staff.
- Ensure the availability of resources essential to establish, implement, maintain and improve the Energy Management System. Resources include human resources, specialised skills, technology and financial resources.
- Appointing a Group Energy Management Representative

Property Manager

- Decide with the Group Energy Management Representative what form external communication will take, if any.
- Ensure the availability of resources essential to establish, implement, maintain and improve the Energy Management System. Resources include human resources, specialised skills, technology and financial resources.

Group Energy Management Representative

- Ensure the Energy Management System is established, implemented and maintained in accordance with I.S. EN 16001.
- Report on the performance of the Energy Management System to the Property Manager for their review, with recommendations for improvement.
- Discuss assessment of energy aspects with location managers
- Complete TMS questionnaire when new legislation is published.
- Review compliance with Legislation frequently and notify Locations of this review.
- Notify Locations of any agreements with third parties and of how it affects them.
- Communicate with locations with regard to their training and awareness requirements and develop a training schedule for the forthcoming year to serve these requirements.
- To ensure that each level of management, both above and below them, are informed and appropriately trained in the field of energy management.
- Circulate Energy Case Studies around the various locations.
- Summarise all external communications received in locations for the Property Manager.
- Decide with the Property Manager what form external communication will take, if any.
- Generate, update and maintain all Energy Management System documentation, and notify relevant personnel of any changes to the system.
- Identify and raise non-conformances resulting from monitoring data on MaPS, notify Location Managers of such and verify that follow-up action is complete.
- Record the minutes of Annual Energy Management Reviews.

Performance Manager

- Report on the performance of the Energy Management System for review, with recommendations for improvement.
- Notify Locations of any agreements with third parties and of how it affects them.
- Circulate Energy Case Studies around the various locations.
- Identify and raise non-conformances resulting from monitoring data on MaPS, notify Location Managers of such and verify that follow-up action is complete.

Location Manager

- Assess energy aspects annually.
- Discuss the Register of Aspects with Location Energy Officer and set targets and objectives for the associated energy factors.
- Identify the training and awareness requirements of new and existing employees, and communicate these needs to the Group Energy Management Representative.
- Provide the time to employees to avail of energy training organised by the Group Energy Management Representative.
- Carry out the awareness campaigns in their location as per instructions from the Group Energy Management Representative.
- Complete the M&Q 116 forms for each employee to certify that they have reached a sufficient level of competence to do the tasks assigned.
- Document all external communication received and inform the Group Energy Management Representative.
- Submit suggestions or ideas for the improvement of the Energy Management System to the Group Energy Management Representative.
- Approve and sign off new or modified location specific documents.
- Identify non-conformances of Energy Improvement Programmes at Location Energy Meetings, document them on the Non-Conformances Form, and sign off to verify that remedial action has taken place.

Location Energy Officer

- Assess energy Aspects annually
- Discuss the Register of Aspects with Location Manager and set targets and objectives for the associated energy factors.
- Identify the training and awareness requirements of new and existing employees during Location Energy Meetings and communicate these needs to the Group Energy Management Representative.
- Carry out the awareness campaigns in their location as per instructions from the Group Energy Management Representative.
- Develop site specific awareness campaigns as required.
- Maintain the Locations Energy Competency Matrix and the appropriate records in the Locations training file.

- Maintain the Locations Energy Notice Board with information on Improvement Programmes and data from MaPS.
- Record opportunities raised in the Register of Opportunities.
- Recording and documenting the minutes of Location Energy Meetings.
- Complete the annual Energy Performance Report and Monitoring and Measuring Plan for the forthcoming year and communicate these to the Group Energy Management Representative.
- Submit suggestions or ideas for the improvement of the Energy Management System to the Group Energy Management Representative.
- Generate Location specific documents as necessary.
- Document all non-conformances in the Energy Management System Working Folder, take the necessary action to deal with the non-conformances, and notify the relevant person when the issue is closed off.

Employees

- Be energy aware and have regard to energy efficiency at all times.
- Comply with all requirements of the Energy Management System.
- Report any non-conformances identified to the Location Energy Manager or the Location Manager.
- Play an active role in improving energy performance and provide suggestions for the Register of Opportunities.

Contractors

- Be energy aware and have regard to energy efficiency at all times.
- Comply with all requirements of the Energy Management System.
- Report any non-conformances identified to the Location Energy Manager or the Location Manager.
- Play an active role in improving energy performance and provide suggestions for the Register of Opportunities.

Internal Auditor

- To have a reasonable technical understanding of Roadstone Woods Energy Management System, the I.S. EN 16001 Standard and of the processes being examined.
- Be independent from the location or process being audited as per the Procedure for Internal Auditing.
- Be familiar of the correct form an audit must take.
- Raise non-conformances by documenting them on the Non-Conformance Form.
- Sign off the non-conformances to verify that remedial action has taken place.

TMS Consultancy Ltd

- Maintain the Register of Legislation on their website.
- Issue a questionnaire to the Group Energy Management Representative to assess relevance of new legislation to Roadstone Wood.
- Provide a summary for each piece of legislation detailing how it affects Roadstone Wood.

Sustainable Energy Ireland

- Fulfil their obligations as set out in the Roadstone Wood Ltd. Family Agreement.

- Keep the Group Energy Management Representative updated with relevant information in relation to Energy Management Seminars and Training Workshops.

External Auditor

- Complete audits to ensure the Energy Management System is established, implemented and maintained in accordance with I.S. EN 16001.
- Issue Audit Reports with Category Findings.
- Liaise with Location Energy Officer and/or Location Manager regarding response to audit findings.

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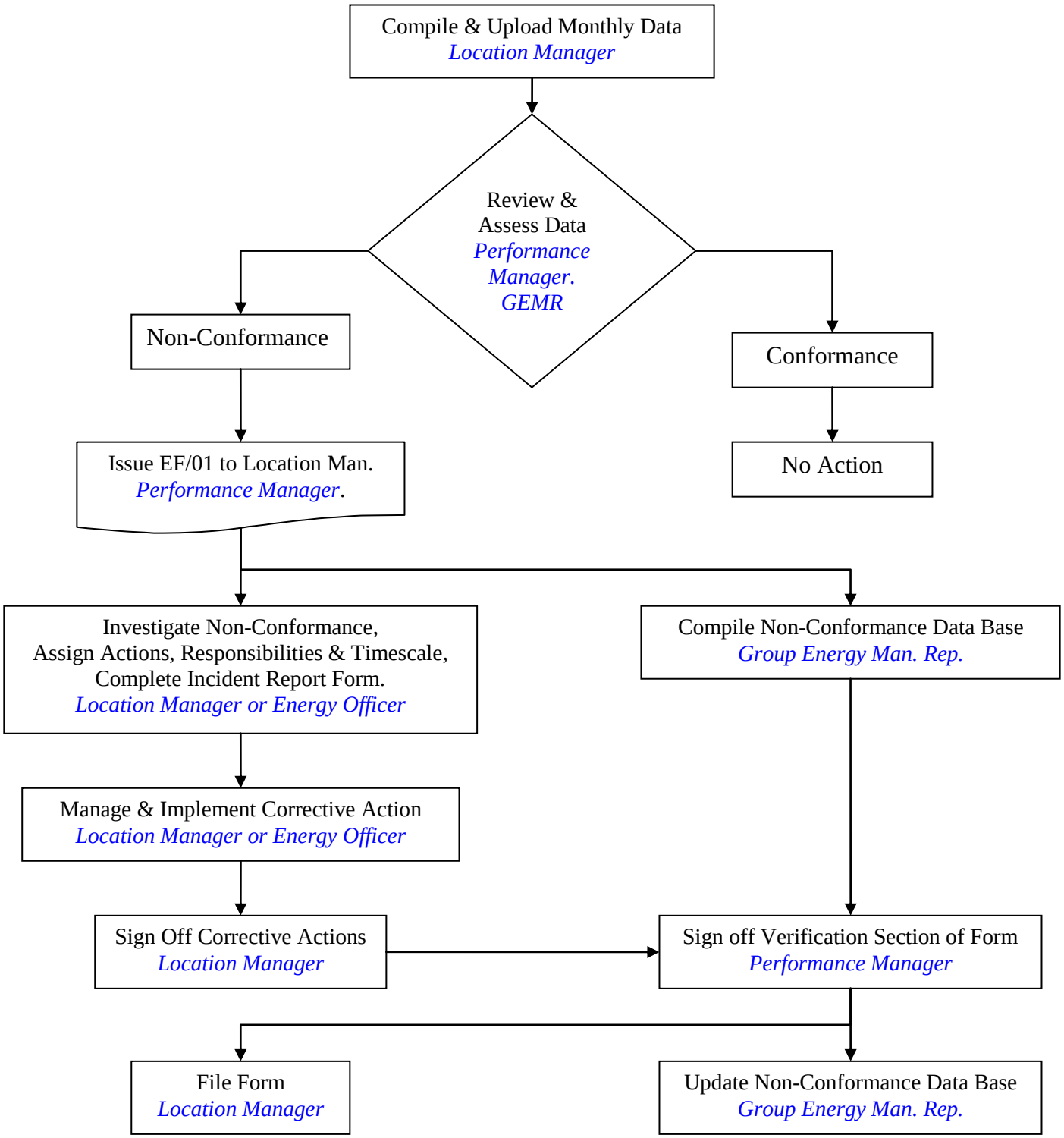
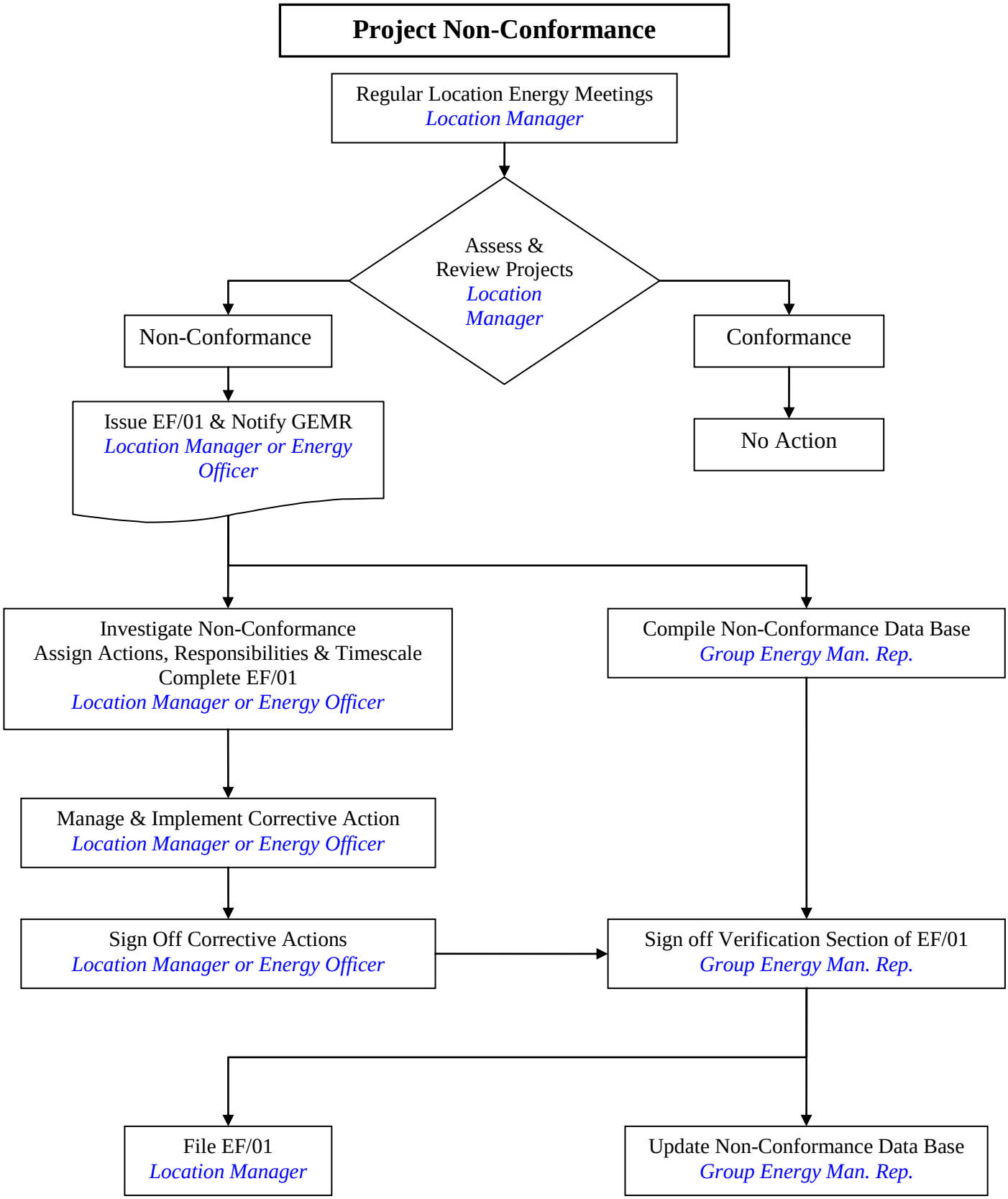
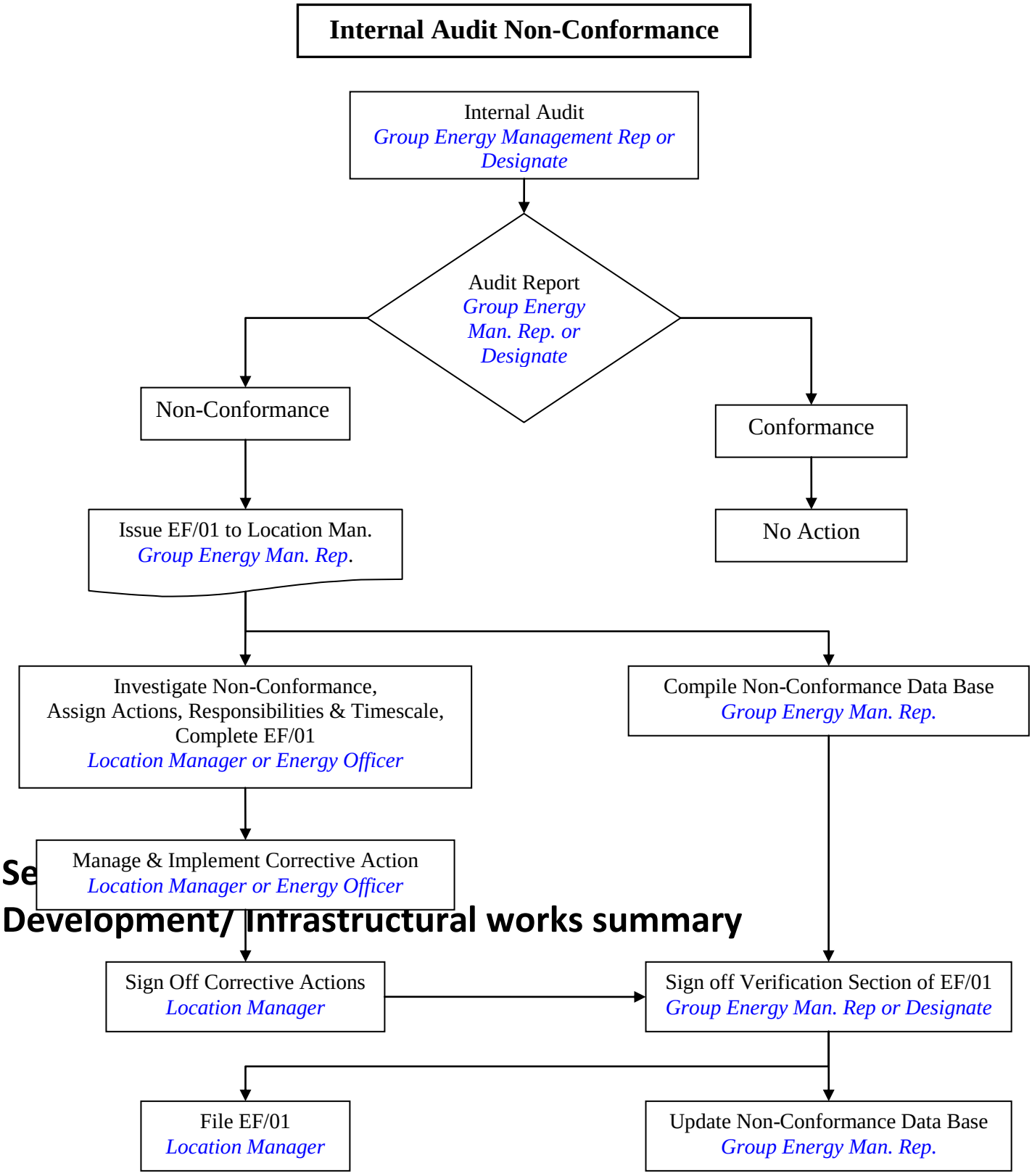
Appendix B

Data / MaPS Non-Conformances



Project Non-Conformance





Se
Development/ Infrastructural works summary

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

Ground Swale – Validation Report

Description of works: Installation of a ground swale as required by section 3.14 of waste licence W0269-01 at Fassaroe waste facility. This ground swale has been installed in front of the Southern Quarry Production pond

Drawings of the Works: Please find attached a photograph of the ground swale

Records and results of tests carried out: N/A

Drawings and sections showing the location of all samples and tests carried out: N/A

Name of contractor responsible for carrying out the specified engineering works: Donohoe Excavations

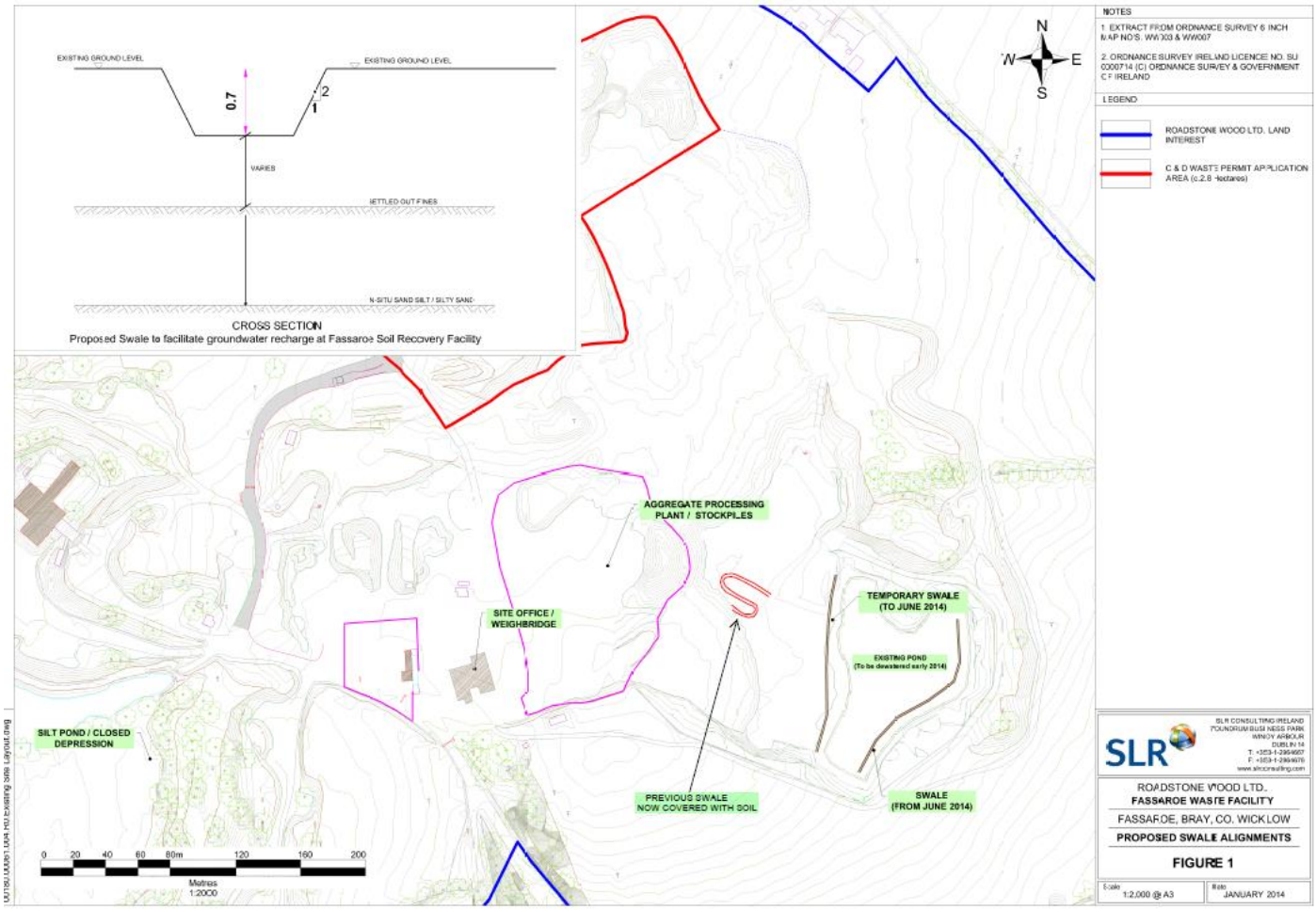
Records of any problems and the remedial work carried out to resolve those problems: None

Any other information: None

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

Date:_____

Signed:_____


EXISTING GROUND LEVEL
EXISTING GROUND LEVEL
0.7
2
1
VARIES
SETTLED OUT FINES
IN-SITU SAND SILT / SILTY SAND
CROSS SECTION
Proposed Swale to facilitate groundwater recharge at Fassaroe Soil Recovery Facility
N
W
E
S
NOTES
1. EXTRACT FROM ORDNANCE SURVEY 6 INCH MAP NO'S. WW303 & WW007
2. ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000714 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
LEGEND
ROADSTONE WOOD LTD. LAND INTEREST
C & D WASTE PERMIT APPLICATION AREA (c.2.8 Hectares)
AGGREGATE PROCESSING PLANT / STOCKPILES
SITE OFFICE / WEIGHBRIDGE
TEMPORARY SWALE (TO JUNE 2014)
EXISTING POND (To be dewatered early 2014)
SILT POND / CLOSED DEPRESSION
PREVIOUS SWALE NOW COVERED WITH SOIL
SWALE (FROM JUNE 2014)
0 20 40 60 80m 120 160 200
Metres
1:2000
SLR
SLR CONSULTING IRELAND
TOUNGRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN 14
ROADSTONE WOOD LTD.
FASSAROE WASTE FACILITY
FASSAROE, BRAY, CO. WICKLOW
PROPOSED SWALE ALIGNMENTS
FIGURE 1
Scale
1:2,000 @ A3
Date
JANUARY 2014

Section 22:
Financial Provisions

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

A.E.R. W0269-01

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	GB00002926LI14A (Employers Liability) GB00002928LI14A (Public/Products Liability) GB00010400LI14A (Public/Products Liability Excess)
Period Liability	1st February 2014 to 31st January 2015
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
Noting the Interest of	South Dublin County Council
Clauses (PL/Products)	Indemnity to Principals Contractual Liability Cross Liabilities
Excesses	€10,000 Property Damage €35,000 Financial Loss

XL INSURANCE COMPANY SE

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 10th December 2014

Bank of Ireland
Corporate Banking

2 Burlington Plaza
Burlington Road
Dublin 4, Ireland
Tel +353 (0)76 624 4400
Fax +353 (0)76 624 4655
www.bankofireland.com/corporatebanking

Noel Murphy
ISAC CRH Ltd.,
Fortunestown,
Tallaght,
Dublin 24.

Date: 21 March 2013

In reply to your recent enquiry the following information is given in strict confidence for your private use only, and without responsibility on part of this Bank or the writer, and where the information has been obtained from another bank or informant, without responsibility on the part of themselves or of their officials.

Subject: Roadstone Wood Ltd

Subject is a subsidiary of a publicity quoted limited company whose financial information is freely available. We would consider their management capable and trustworthy and would consider them good in the way of business generally and in our opinion they would not undertake any commitment that they could not fulfil.

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

Section 23:
CRAMP

Fassaroe Inert Waste Recovery Facility
Fassaroe, Bray, Co. Wicklow

Closure, Restoration and Aftercare Management Plan (CRAMP)

October 2011
SLR Ref: 501.00180.00028. Rev0

CONTENTS

FIGURES

1.0 Introduction

1.1 Waste Licence – Condition 10

This Closure, Restoration and Aftercare Management Plan (CRAMP) was prepared in compliance with Condition 10 of Waste Licence No. W0269-01 issued to Roadstone Wood Ltd. for the continued operation of its existing construction and demolition waste recovery facility at Fassaroe, Bray, Co. Wicklow and the backfilling of the adjoining, worked out quarry void using imported and site-won inert soils. Condition 10 of the Waste Licence states that:

"10.1 The facility shall be restored in accordance with Figure 2.6 *Phasing Plan* of the EIS.

10.2 Final Levels/Profile

10.2.1 The final profile of the facility shall tie-in to the surrounding land levels and shall be as shown in Figure B2.5 *Restored Cross Sections* in the licence application.

10.2.2 Within twelve months of completion of each phase of waste deposition, that phase shall be progressively restored to agricultural grassland.

10.2.3 Developed areas shall be profiled so that no depression exists in which water may accumulate. Any depressions arising after profiling shall be rectified by the emplacement of suitable capping or restoration materials.

10.2.4 Final contours and landscaping should be such that the finished slopes of the facility are structurally stable, resistant to erosion, and protective of pollutant control and monitoring infrastructure.

10.3 Final Capping

10.3.1 Unless otherwise agreed by the Agency, filled areas shall be permanently capped within 6 months of the areas having been filled to the required level.

10.3.2 Unless otherwise agreed by the Agency, the final capping shall consist of the following:

(i) Top soil (150-300mm); and

(ii) Subsoils, such that total thickness of top soil and subsoils is at least 1m.

10.4 No material or object that is incompatible with the proposed restoration of the facility shall be present within 1m of the final soil surface levels.

10.5 All waste activities at the facility shall cease upon the installation of the final capping unless otherwise agreed by the Agency.

10.6 Following termination, or planned cessation for a period greater than six months, of use or involvement of all or part of the site in the licensed activity, the licensee shall, to the satisfaction of the Agency, decommission, render safe or remove for disposal/recovery any soil, subsoil, buildings plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.

10.7 Closure, Restoration and Aftercare Management Plan (CRAMP)

10.7.1 The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for the decommissioning or closure of the site or part thereof. This

plan shall be submitted to the Agency for agreement within six months of the date of grant of the licence.
10.7.2 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.
10.7.3 The licensee shall have regard to the Environmental Protection Agency Guidance on Environmental Liability Risk Assessment, Decommissioning Management Plans and Financial Provision when implementing Condition 10.7.1 above.

10.8 The CRAMP shall include, as minimum, the following:

(i) a scope statement for the plan;
(ii) the criteria that define the successful decommissioning of the activity or part thereof, which ensures minimum impact on the environment;
(iii) a programme to achieve the stated criteria;
(iv) where relevant, a test programme to demonstrate the successful implementation of the decommissioning plan; and
(v) details of the costing for the plan and the financial provisions to underwrite the cost.

10.9 A final validation report to include a certificate of completion for the CRAMP, for all or part of the site as necessary, shall be submitted to the Agency within three months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment."

1.2 Scope of CRAMP

The objective of the CRAMP is to ensure that the waste licence area is restored to agricultural land. The scope of the CRAMP includes:

- a Site Evaluation, including the planning history and a site inventory;
- 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 Site Restoration and Aftercare proposals, including a restoration and aftercare management costing.

2.0 Site evaluation

2.1 Site Description

The site to which this CRAMP refers is located entirely within the townland of Fassaroe, Co. Wicklow approximately 1.5km west of Bray town and 2km east of Enniskerry village. The Waste Licence area and the extent of the lands owned by Roadstone Wood Ltd. are outlined on a 1:50,000 scale map of the area, on Figure 1.

The waste licence area covers an area of approximately 21.4hectares (51.5acres). The site is located within an existing construction materials production facility operated by Roadstone Wood Ltd. The quarry void to be backfilled using inert soil and stone is located in the eastern part of the waste licence area. The existing site layout is shown on Figure 2.

Ground levels across the site follow that of the (original) surrounding ground, falling south-eastwards from approximately 95mOD to 74mOD (Malin), toward the Cookstown and Dargle Rivers. The existing quarry void covers an area of approximately 4.5 hectares (10.8 acres) and its depth from existing ground level varies from 18m at its northern end to 10m at its southern end.

Aggregate processing and value added production activities are currently undertaken within the waste licence site. The principal aggregate processing activity is the washing and screening of imported sand and gravel, while the principal value added activity is the production of readymixed concrete.

2.2 Planning History

No planning permission was ever issued in respect of quarrying activities at the application site as it was established and operating prior to the introduction of planning controls under the Local Government (Planning and Development) Act of 1963.

Planning permission for the existing construction and demolition waste recovery facility within the application site was granted by Bord Pleanala on appeal in July 2004 (Wicklow County Council Planning Ref. No. 03/9501). An application for renewal of the planning permission was granted by Wicklow County Council in January 2009.

Roadstone Dublin has operated a construction and demolition waste recovery facility at the application site since 2004. The facility is operated in accordance with the conditions attaching to a waste permit (Reference Number ESS/15/8/12) issued by Wicklow County Council for an initial three year period in 2004. The waste permit was subsequently renewed for a further three year period by Wicklow County Council in July 2008 (Ref. No. ESS/15/8/12-339). A separate waste permit application was submitted to Wicklow County Council in May 2008 to provide for partial backfilling of the existing quarry. This waste permit was issued, with conditions, in April 2009. The waste permit was superseded by the granting of the waste licence in March 2011.

A planning application to provide for the backfilling and restoration of the existing void at Fassaroe was submitted to Wicklow County Council in July 2008 (Planning Register Reference No. 08/1258). A final decision to grant planning permission for this activity was issued by Wicklow County Council on 21st January 2009.

2.3 Site Inventory/Infrastructure

The site facilities, site plant and site infrastructure are listed below (refer to Figure 2). Please note that these are shared with the concrete production facility:

- Buildings: site office; maintenance shed; waste quarantine shed.
- Infrastructure: paved and unpaved internal road system; employee and visitor parking.
- Hardstanding & paved areas: retail area; storage yard; block yard; concrete yard and C&D waste recycling area.
- Plant & Machinery: wheel wash; weighbridge; bunded fuel tanks; mobile crushing and screening plant; mechanical excavators; bulldozers.
- Services: 3 septic tanks; Dublin City Council Water main; Internal buried water supply and wastewater pipe work, short section of buried electrical cable (west of the block yard); several overhead electricity transmission cables.

2.4 Reasons for Restoration and Aftercare Management Plan

The Inert Waste Recovery Facility at Fassaroe will result in substantial landform changes. This is one of the two main circumstances listed in the EPA Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision, which require a site restoration and aftercare management plan.

3.0 Closure considerations

The operation of the Waste Recovery Facility at Fassaroe provides for the phased backfilling and restoration of the large existing void created by previous extraction of sand and gravel. Therefore, on completion of the final backfilling phase, the majority of the site will already be restored. The full restoration of the final section of the site to agricultural land will lead to Clean Closure in a short space of time.

On completion of the fourth (and final) phase of the restoration works, all mobile plant and equipment associated with the backfilling, placement and compaction of soil will be removed off site. Any dedicated infrastructure and/or services will also be progressively decommissioned and removed off-site. Any plant, equipment and infrastructure required for C&D waste recovery activities and concrete production facility will however remain in place.

Wherever necessary, hard standing surfaces will be broken up using a hydraulic breaker and subjected to validation testing to confirm the materials are acceptable for re-use within the Applicant's landholding for construction of haul roads and/or other hard standing areas. Any materials which are found to exceed inert waste criteria will be transferred off site to a suitably licensed waste disposal or recovery facility.

Provision will be made for short-term (< 1year) environmental monitoring of air, surface water and groundwater.

4.0 Criteria for successful closure

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

- the restoration area will be returned to productive agricultural land;
- there should be no constraints on future land use, due to contamination or structures;
- all mobile plant and equipment associated with the backfilling, placement and compaction of soil will have been removed off site;
- short-term (< 1year) environmental monitoring of air, surface water and groundwater will be carried out and no air or surface/groundwater contamination will be found on site; and
- the overall objective is for initial non clean closure and following site restoration and aftercare, to achieve clean closure of the site with no residual liabilities or constraints.

5.0 closure plan costing

The expected cost, associated with the closure, are outlined in table 5-1 below.

Table 5-1
Site Closure Costs

Item	Removal Cost €
Removal of all mobile plant off site	00.00
Decommissioning of dedicated infrastructure and/or services	00.00
Breaking up of hard standing surfaces (using a hydraulic breaker) and validation testing to confirm that the materials are acceptable for re-use on site	00.00
Transfer off site of any material exceeding inert waste criteria	00.00
short-term (< 1year) environmental monitoring of air, surface water and groundwater	00.00
Total site closure cost (excl. VAT)	**00.00**

6.0 closure plan update & review

The Closure Plan will be reviewed and updated annually as part of the Annual Environmental Report (AER) submission to the EPA.
The updated and reviewed Closure Plan will take account of any site or process changes, technology changes and costing changes.

7.0 closure plan implementation

The closure of the Waste Recovery Facility is currently projected in 6-8 years time (subject to review dependant on the rate of infilling). However, the EPA will be given 3 months notice and 6 months notice of any partial or full closures respectively. The form of notice will be in accordance with prevailing guidance and it is expected that there will also be discussions with the EPA as part of the process.

8.0 Closure Plan validation

As required by Condition 10.9 of the Waste Licence a final validation report (including a certificate of completion for the CRAMP) for the site will be submitted to the Agency within 3 months of completion of the works outlined.
The validation audit will be undertaken by an independent, external environmental consultant. The final validation report will include:

- an assessment of how the requirements of the closure plan have been met;
- final 'as-restored' drawings and photographs of the site;
- results of the short them environmental monitoring which will follow the site closure; and
- a certificate of completion for the cramp.

9.0 site restoration and aftercare

9.1 Site Restoration and Remediation Proposals

The waste recovery facility at Fassaroe provides for the backfilling of the large existing void created by previous extraction of sand and gravel, thereby enabling the restoration of the site to agricultural grassland.

9.1.1 Backfilling/Earthworks/Grass seeding

The backfilling of the site will proceed in several phases and, on completion, will merge into the surrounding undulating pastoral landscape. An outline of the proposed phasing and the final ground level contours are shown in Figure 3. In addition to imported materials, soil in

existing screening berms and/or stockpiles within the site area will also be used to backfill the former quarry. Cross-sections through the final landform are shown in Figure 4.
It is currently envisaged that backfilling of the existing void will proceed from the northern to the southern end of the quarry. Any temporary additional or replacement infrastructure required to facilitate the proposed works will be constructed and/or installed at the outset of the first phase of backfilling.
Formation levels for backfilling across the application site are taken to be equivalent to existing ground levels, surrounding the area to be filled, as indicated on Figure 2. During each restoration phase, the upper surface of the backfilled materials will be graded so as to ensure surface water run-off falls to the floor of the pit and thereafter, via a network of drainage channels through the basal silt, towards the southern pond. As the surface water pond on the quarry floor is not hydraulically connected to the groundwater table, no intermediate settling ponds need be provided as suspended solids in surface water run-off will settle out in the surface water pond.
Temporary access ramps into and out of the active backfilling areas will generally be constructed at a gradient of approximately 1v:10h. Temporary side slopes 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 very shallow, generally no greater than 1v:15h.
Following each restoration phase, a cover layer of subsoil and topsoil will be placed and graded across the backfilled soil, in accordance with the details set out in condition 10 of the waste licence (refer to section 1.0 above). This will then be seeded with grass in order to promote stability, minimise soil erosion and dust generation and to complete the restoration to agricultural land.
On completion of all restoration works the final surface contouring will be assessed and adjusted where/if required. Subsequently, the grass sward will be examined and 'repaired' where necessary. It is envisaged that the restored grassland will be handed over to a local farmer as soon as possible following the completion of all restoration works. The establishment/aftercare would be carried out by the farmer, according to his/her requirements for the future use of the agricultural land.

9.1.2 Proposed Planting, Establishment and Aftercare

As part of the C&D Waste Recovery Facility planning permission, it is proposed to carry out hedge planting along parts of the western and parallel to the northern boundary of the site, as shown on Figure 3. This will strengthen the security of these boundaries as well as provide additional screening vegetation for neighbouring properties.
The proposed hedge mix consists of locally occurring native species, which will be sourced locally. All planting will be carried out according to current best practice. 24 months establishment maintenance will be carried out, to include weed control, watering (if required) and the adjustment of ties and stakes.

9.2 Aftercare Management

9.2.1 Proposed Short Term Aftercare Monitoring and Maintenance

The Aftercare Management Plan will comprise three main activities:

1. Environmental Monitoring

As previously stated (sections 3.0, 4.0 & 5.0 above), short-term (< 1year) environmental monitoring of air, surface water and groundwater will be carried out to ensure that no surface/groundwater contamination is present/emerging following the closure of the waste facility.

2. Maintenance of grass sward

The aftercare of the grass sward will be as per the manufacturer's instructions of the grass seed used and as per the requirements of the proposed future use of the agricultural site (e.g. for grazing or crops). The initial maintenance management will be supervised by the facility manager or other designated Roadstone Wood Ltd. staff. The maintenance will be handed over to a local farmer, as soon as an appointment has been made.

3. Maintenance of hedge planting

It is expected that the 24 months aftercare maintenance period for the proposed hedge planting has already been completed, when the aftercare period for the lands affected by the waste licence starts. However, if this is not the case 4 maintenance visits per year (between April & October) will be carried out by a suitably qualified landscape contractor. During these visits weeds within 1m of the base of the hedge will be controlled mechanically and/or chemically; stakes, ties and spiral guards will be adjusted and any required formative pruning or deadwood removal will be carried out. If required the plants will be watered. At the end of each growing season (October) the rate of plant failures will be assessed and any necessary replacement planting carried out to ensure the establishment of a dense, continuous hedge.
All hedge maintenance procedures will be carried out in line with current best practice.

9.2.2 Proposed Long Term Aftercare Monitoring and Maintenance

Due to the inert filling material and proposed agricultural end use of the site no long term aftercare monitoring and maintenance will be required.

9.3 Site Restoration and Aftercare Management Costs

The expected cost, associated with the site restoration and aftercare management, are outlined in table 9-1 below.

Table 9-1
Current Estimated Restoration and Aftercare Costs
(Based on a 2 Year Aftercare Period)

Item	Costs (€)

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

Item	Costs (€)
Final Capping (150-300mm) topsoil & (700-850mmm) subsoil	0.00
Surface preparation and grass seeding	0.00
Hedge Planting (Ground preparation, supply of plants and planting works)	0.00
24 months establishment maintenance for grassed area and hedge planting	0.00
Total Restoration and Aftercare Cost (excl. VAT)	**0.00**

10.0 Closure

This report has been prepared by SLR Consulting Limited 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 Wood 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.

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

FIGURES

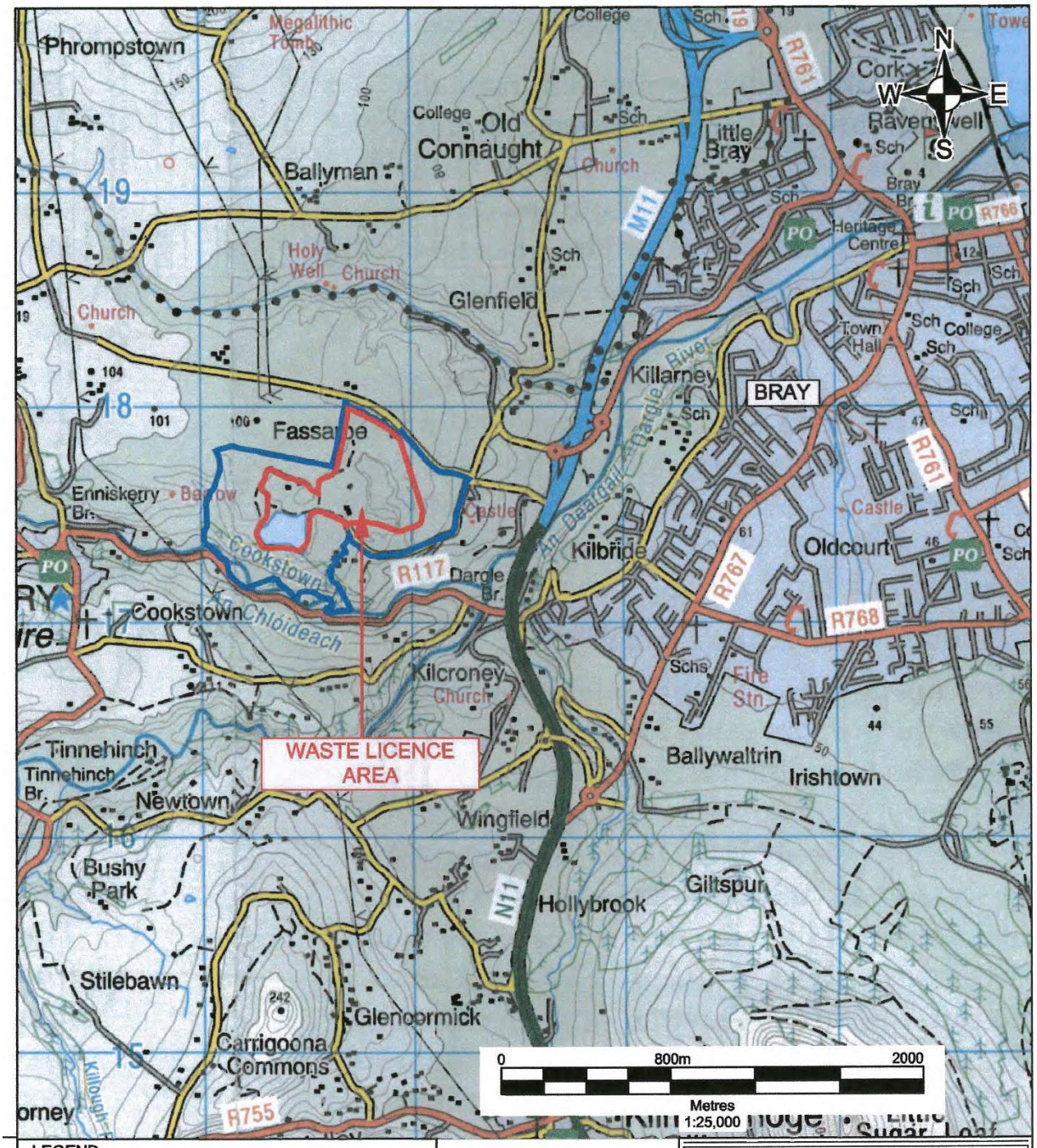
Figure 1
Site Location Map

Figure 2
Existing Site Layout

Figure 3
Restoration Proposals

Figure 4
Restored Cross Sections

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24



LEGEND

- *Applicants Land Interest (c. 65.1 ha)*
- *Waste Licence Area (c. 25.6 ha)*

NOTES

1. *Extract from Ordnance Survey Discovery Map No. 50*
2. *Ordnance Survey Ireland Licence No. SU 0000711 (c) Ordnance Survey Ireland / Government of Ireland*

SLR CONSULTING IRELAND
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ROADSTONE WOOD LTD.

FASSAROE WASTE RECOVERY FACILITY
FASSAROE, BRAY, CO. WICKLOW
- CRAMP -

SITE LOCATION MAP

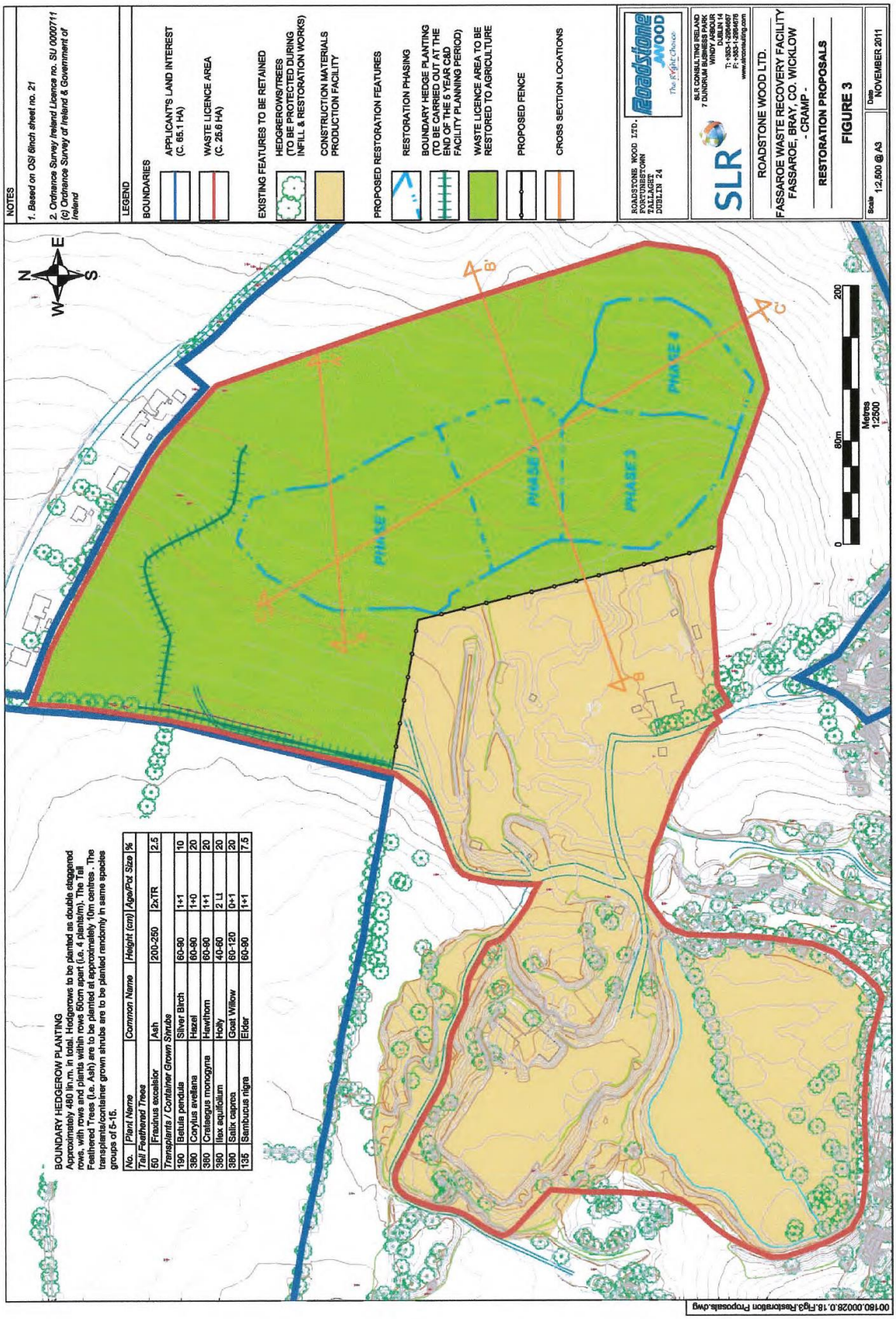
FIGURE 1

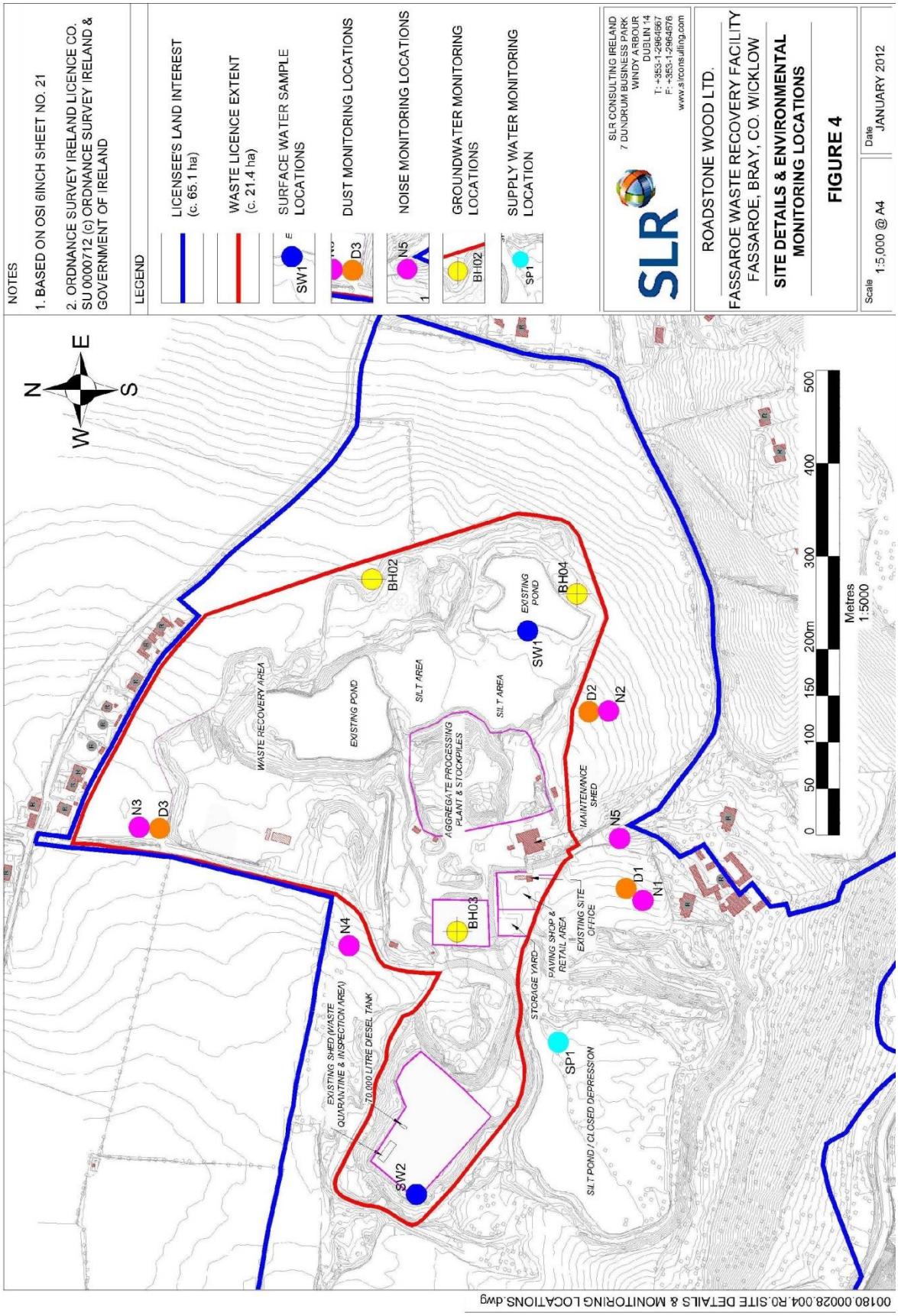
Scale: 1:25,000 @ A4

Date: NOVEMBER 2011

00150.00026.010.rg1.Site Location Map.dwg

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24




NOTES
1. BASED ON OSI 6INCH SHEET NO. 21
2. ORDNANCE SURVEY IRELAND LICENCE CO. SU 0000712 (c) ORDNANCE SURVEY IRELAND & GOVERNMENT OF IRELAND
LEGEND
LICENSEE'S LAND INTEREST (c. 65.1 ha)
WASTE LICENCE EXTENT (c. 21.4 ha)
SURFACE WATER SAMPLE LOCATIONS
DUST MONITORING LOCATIONS
NOISE MONITORING LOCATIONS
GROUNDWATER MONITORING LOCATIONS
SUPPLY WATER MONITORING LOCATION
SLR CONSULTING IRELAND
7 DUNDRUM BUSINESS PARK
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T: +353-1-2964667
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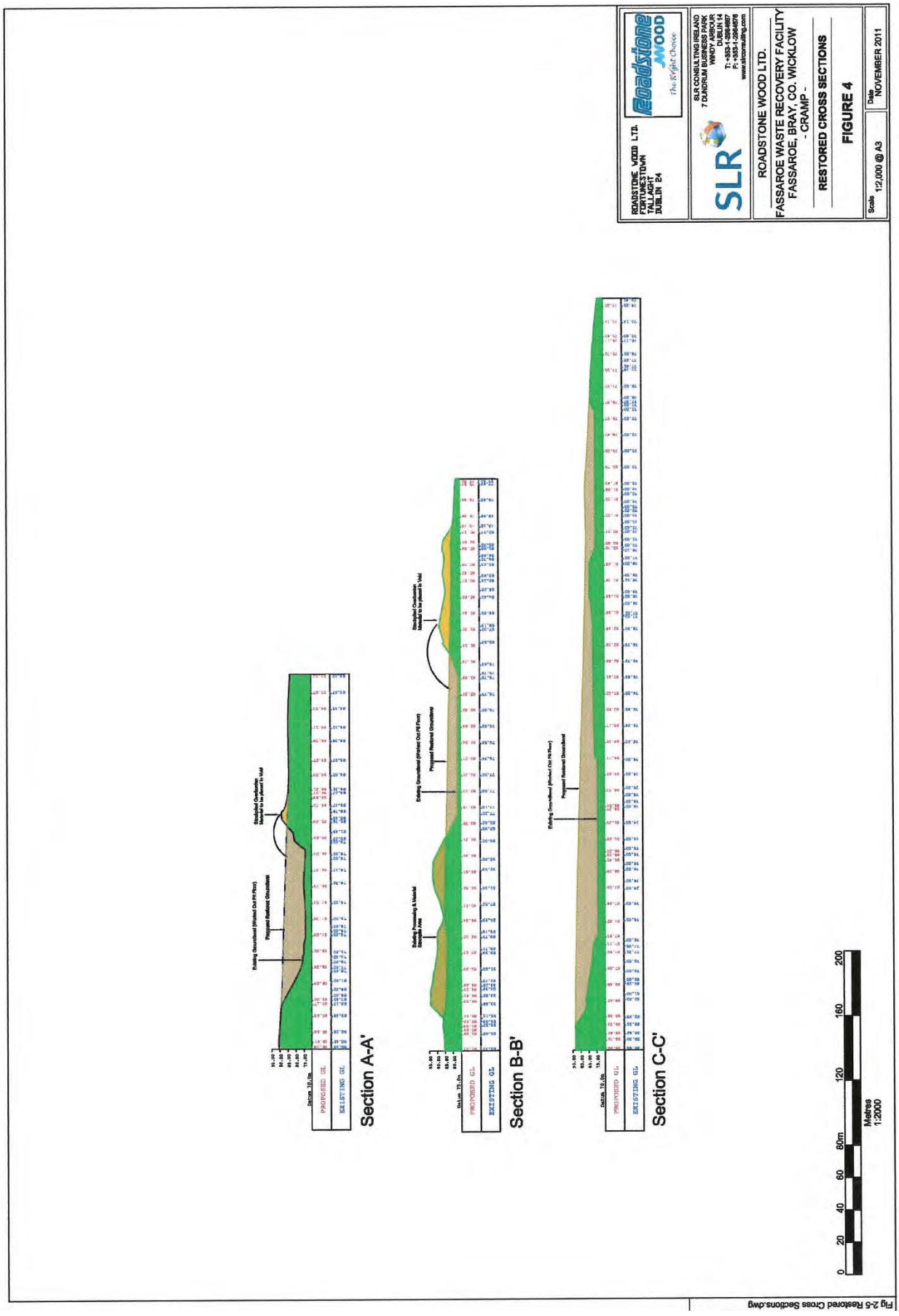
www.slrconsulting.com
SLR
ROADSTONE WOOD LTD.
FASSAROE WASTE RECOVERY FACILITY
FASSAROE, BRAY, CO. WICKLOW
SITE DETAILS & ENVIRONMENTAL MONITORING LOCATIONS
FIGURE 4
Scale 1:5,000 @ A4
Date JANUARY 2012
N
E
S
W
WASTE RECOVERY AREA
EXISTING POND
SILT AREA
AGGREGATE PROCESSING PLANT & STOCKPILES
SILT AREA
EXISTING POND
MAINTENANCE SHED
EXISTING SITE OFFICE
PAVING SHOP & RETAIL AREA
STORAGE YARD
SILT POND / CLOSED DEPRESSION
EXISTING SHED (WASTE QUARANTINE & INSPECTION AREA)
70,000 LITRE DIESEL TANK
BH02
BH04
BH03
SW1
SW2
SP1
N1
N2
N3
N4
N5
D1
D2
D3
0
50
100
150
200m
300
400
500
Metres
1:5000
00180.00028.004.R0.SITE DETAILS & MONITORING LOCATIONS.dwg

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24



Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

A.E.R. W0269-01

Section 24:
Outline Env. Contingency Plan

ROADSTONE DUBLIN LIMITED

INERT WASTE RECOVERY FACILITY
FASSAROE, BRAY, CO. WICKLOW

OUTLINE ENVIRONMENTAL CONTINGENCY PLAN

APRIL 2009

Prepared by :
SLR Consulting Ireland
7 Dundrum Business Park
Windy Arbour
Dublin 14

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24

CONTENTS

Page No.

Roadstone Ltd
Fortunestown,
Tallaght,
Dublin 24.

A.E.R. W0269-01

ACCIDENTS AND THEIR CONSEQUENCES

Introduction

This document is the Contingency Plan for the inert waste recovery facility operated by Roadstone Dublin Ltd. at Fassaroe, Bray, Co. Wicklow. The principal waste activities at the site are

(i) the placement and compaction of inert soils in an existing quarry void and
(ii) recovery (processing) of inert construction and demolition (C+D) waste.

All inert soils are imported to site from external construction and development sites. C+D waste is imported to the facility from external construction sites and is also sourced from the adjacent concrete production facility and retail shop operated by Roadstone Dublin Ltd.

The purpose of this document is to identify contingency plans and arrangements that will be implemented during the operation of the inert waste recovery facility.

This document considers those aspects of on-site operations that may pose a risk of accidents with environmental consequences.

The resultant accident management plan describes the various techniques that will be implemented at the site to minimise the risks presented by site operations to the environment. It does not include those accidents, which may solely affect the health and safety of operatives, contractors or visitors to the site.

Accident / Hazard Identification

The following categories of potential hazard / accident have been identified and risk management measures are detailed in the following sections, which should be implemented at the site to ensure the environmental risks associated with the hazards are tolerable.

Fire

The fire management plan, which describes the procedures and precautions that will be implemented at the site, is presented in Section 2 of this plan.

Spillage and Leakage

Procedures that will be implemented at the site to minimise the risk from spillage and leakage is presented in Section 3 of this plan.

Stability

The measures to be taken during both the design process and during routine operations to ensure the stability of the site and prevent soil slippage are detailed in Section 4 of this plan.

Measures that will be adopted to minimise the potential environmental impact associated with deliberate damage to control mechanisms such as fuel storage facilities are detailed in Section 5 of this plan.

2. FIRE MANAGEMENT PLAN

2.1 Operational Techniques

Waste management sites can represent a potential fire risk for a number of reasons.

Site buildings contain electrical appliances and other sources of ignition along with materials that would readily burn.

- Litter and waste materials may support combustion.
- Maintenance activities on plant and equipment can represent a potential fire risk if necessary precautions are not taken.

Specific action that will be taken to prevent and minimise the risk of fires from these particular sources, together with general fire prevention precautions are detailed below.

Site Buildings/Electrical Appliances

All electrical appliances in use at the site will be tested in accordance with the Electrical Testing Regulations.

Housekeeping

Site buildings will be maintained in a tidy condition, and will be regularly cleaned to avoid the accumulation of paper and debris that may present an increased fire risk.

Litter and Combustible Waste

No litter or potentially combustible waste will be permitted to accumulate at the site.

Management Responsibility

The Facility Manager will have responsibility for ensuring that potential fire nuisances and hazards arising from site operations are minimised.

Training

All employees will undergo training relevant to their role in fire prevention, use of fire extinguishers, and emergency procedures.

Smoking Policy

Smoking will only permitted at designated areas and specifically not within site buildings.

Fire Protection Equipment

Where appropriate, plant will be fitted with automated fire protection equipment.

Hot Work Permitting System

A formal permit to work system will be in place to ensure appropriate precautions are taken and approval obtained prior to any hot work being carried out on site plant and equipment.

Fire Fighting Equipment

Fire extinguishers will be provided in the site buildings and will be used if it is appropriate and safe to do so, in the event that fire is discovered in the building.

Smoke and Fire Alarms

Smoke and fire alarms will be fitted in the site offices.

2.2 Monitoring Techniques

All operatives will remain vigilant regarding the breakout of fire at the site, and the emergency procedure and action plan outlined below will be followed if fire is observed.

2.3 Fire Action Plan

Fire within Site Buildings

- The person discovering the fire will raise the alarm.
- If the fire cannot be safely tackled using appropriate fire extinguishers, the emergency services and the facility manager will be informed.
- Where applicable, and if it is safe to do so, all electrical supplies will be isolated and made safe in the area of the fire.
- The facility manager (or his deputy) will check for all visitors, contractors and staff to ensure everyone is accounted for.
- The facility manager (or his deputy) will direct the emergency services to any casualties.

- All used fire extinguishers will be returned to the supplier for refilling or replacement.

Plant and Equipment Fire

- The person discovering the fire will raise the alarm.
- If the fire cannot be safely tackled using appropriate fire extinguishers the emergency services and the facility manager will be informed
- If it is safe to do so, all electrical supplies will be isolated and made safe in the area of the fire.
- The facility manager (or his deputy) will check for all visitors, contractors and staff to ensure everyone is accounted for.
- The facility manager (or his deputy) will direct the emergency services to any casualties.
- All used fire extinguishers will be returned to the supplier for refilling or replacement.

Records

A fire log will be maintained. It will include the following details: -

- records of the maintenance of fire extinguishers;
- a record of all incidents of fire including date, time, nature and cause of the fire; and
- details on the action taken to extinguish the fire, and any subsequent changes to operational and emergency procedures.

The Environment Protection Agency will be advised of any serious fire incidents at the earliest practicable opportunity.

3 SPILLAGE AND LEAKAGE MANAGEMENT PLAN

3.1 Operational Techniques

In order to prevent spillages and leaks of potentially polluting materials and minimise the impact of any spillages that do occur, the following measures will be implemented at the site.

Unloading Procedure / Overfilling of Tanks and Bowsers

All potentially polluting materials delivered to site will be unloaded by suitably qualified employees from the delivery company, and overseen by a designated site operative. This will prevent the overfilling of mobile fuel bowsers in particular.

Storage Vessels/Containers

Potentially polluting liquids (principally fuel) will be stored in mobile, double skinned bowsers constructed to the appropriate Irish, British or International Standard, meeting the requirements of the Local Government (Water Pollution) Acts 1977 to 1990 and associated regulations.

Other potentially polluting liquids such as lubricating oils, waste oils derived from vehicle maintenance, pesticides etc, will be stored in containers located on sealed (ie. concreted) ground within the existing maintenance sheds.

All solid wastes arising on site and other solid potentially polluting materials will be segregated according to category, stored within containers which are designed to ensure the contents do not spill or escape and covered as necessary.

Inspection and Maintenance

All containers and bowsers will be inspected on a daily basis by the facility manager (or his designated deputy) to ensure their continued integrity, and identify the requirement for any remedial action.

In the event that remedial action is required, arrangements will be made to transfer any potentially polluting materials to secure alternative storage pending completion of remedial work. Remedial work will be undertaken as soon as possible. Containers and bowsers found to be faulty will not be used for the storage of polluting materials until appropriate remedial action is completed.

Absorbent Materials

A supply of materials suitable for absorbing and containing any minor spillage will be maintained on site.

3.2 Spill Containment Equipment

Materials suitable for containing spills including sealing devices and substances for damaged containers, drain seals and booms, and overdrums will be maintained at the site.

Plant Maintenance

All plant and equipment will be subject to maintenance in accordance with the suppliers / manufacturer's recommendations to avoid the failure of items of plant and equipment giving rise to potential emissions to the environment.

Drains

Surface water channels and drains will be subject to daily visual inspection by the Facility Manager. Action will be taken to remove any obstructions to flow.

3.3 Monitoring Techniques

All site personnel will be tasked with monitoring for evidence of spillage and leakage, during their day-to-day routine. The condition of bowsers and containers will also be inspected on a daily basis.

A daily and weekly inspection checklist will be used to record inspections of infrastructure, operations, pollution control and amenity management and monitoring. The inspection checklist will be used by the facility manager to identify requirements for remedial action.

Any evidence of spillage or leakage will be reported immediately to the Facility Manager (or his deputy) for appropriate remedial action.

3.4 Leaks and Spillage Action Plan

In the event of spillage of polluting materials, immediate action will be taken to contain the spillage.

The spillage will be reported to the Facility Manager, who will assess the situation and decide on the most appropriate course of action.

The action taken will depend upon the size of the spillage, the location of the spillage in relation to sensitive receptors and the chemical and physical nature of the spilled material.

Action taken may include some or all of the following: -

- if possible the leak will be stopped;
- if it safe to do so, the cause of the spill or leak will be isolated;
- if the spillage is small, spill granules will be used immediately if necessary to prevent the spill spreading. The area will be cleared and all contaminated material will be sent to an appropriately licensed site for disposal;
- if the spill is larger, inert materials such as clay or sand will be used to make a containment bund and specialist help will be sought to assist in clean up;
- in the event of a potentially serious spillage that may give rise to pollution of surface water immediate action will be taken if possible to prevent the spread of the spill into surface water channels and drains using suitable covers and barriers. The Environment Protection Agency will be informed immediately, and remedial action will be agreed;
- if the spillage cannot be contained using approved materials, the Environment Protection Agency and senior management will be contacted immediately and specialist help obtained;
- if a vehicle is found to be leaking, it will be moved to a position where the spillage can be contained i.e. quarantine facility, or other hard surfaced area, if it is safe to do so; and
- all personnel will follow instructions provided by managers or other competent persons. Appropriate precautions will be taken depending upon the nature of the spilled material to prevent any harm to human health, and all personnel involved in clean up will wear protective clothing appropriate for the nature of the spilled material.

All spillage incidents, site inspections, and remedial actions will be recorded in the site diary.

4 STABILITY MANAGEMENT PLAN

To ensure the long-term integrity of the slopes at the restoration site, precautions will be incorporated both at the design stage and during backfilling operations as detailed below.

4.1 Design Considerations / Stability Assessment

Stability of slopes prior to, during and following restoration of the former quarry is a key consideration during the design process.

The following factors have been taken into account during the design process: -

- *nature of substrata*, i.e. the presence of any historical mining and quarrying, presence of superficial deposits, variation in the water table, geotechnical and hydraulic properties of any materials to be utilised at the site;
- *stability of inert waste materials*, i.e. stability of temporary slopes during backfilling and
- *stability of capping and restoration layers*, i.e. final surface gradients and effects of soil settlement.

4.2 Operational Techniques

The following operational techniques to ensure stability of the backfilled materials, will be adopted at the site.

- *Waste compaction :* Inert waste will be levelled and compacted as soon as possible after discharge at the working area. This will minimise any future settlement, increase the density and strength of the backfill materials and enhance stability;
- *Large objects :* All large inert C+D waste (concrete, boulders etc.) will be crushed to ensure that voids do not develop in the backfilled soil mass;
- *Height of tipping face :* The maximum height of the tipping face after compaction will be 2.5 metres. The end-tipping of uncompacted soil over high unstable faces will therefore be avoided.
- *Gradient of temporary slopes :* During restoration of the site, the slope adopted for temporary unrestored faces sloping to the floor will depend upon the nature of the soil, its moisture content, the height of the slope, nature of the foundation soil and the consequences of failure.

4.3 Monitoring Techniques

The following action will be taken to monitor the stability and settlement of the soil slopes: -

Visual Inspections

Visual inspections will be carried out at weekly intervals to identify the following: -

- evidence of tension cracks in temporary slopes caused by movement of the inert waste;
- evidence of instability or movement (back scarps and/or toe bulging)
- evidence of differential settlement causing depressions in the restored landform or damage to the drainage system.

4.4 Action Plan

In the event that stability or settlement problems are discovered, appropriate remedial action will be taken as detailed below: -

Instability of Waste Mass

If there is visual evidence of movement within the inert soil mass, or evidence from the regular topographical surveys, the situation will be reviewed by a competent independent engineer, and appropriate remedial action will be taken in agreement with the Environment Protection Agency.

The action taken will depend upon the severity of the movement, the timescales over which the unstable mass will remain unsupported, and the consequences of failure.

Action taken may include one or more of the following: -

- the situation will continue to be monitored through regular visual inspections and topographical surveys;
- prohibition of operations at the base of the slope, which may place operatives at potential risk;
- adjustment to phasing of restoration operations to provide additional support to the inert soil mass as soon as possible;
- engineering work to reduce the gradient of the slope and reduce the risk of failure; and
- revised design for future phases to reduce slope gradients and/or height of slopes and reduce time period over which temporary slopes remain unprotected.

Records

Records will be maintained as follows: -

- the results of visual inspections and topographical surveys;
- stability problems including date, nature and suspected cause of the problem; and
- details on the corrective action taken, and any subsequent changes to site design or operational procedures.

5 SECURITY MANAGEMENT PLAN

Many potential problems can arise from inadequate control over access to waste management sites. These problems include: -

- non-permitted waste being imported in contravention of the Waste Licence;
- fly-tipping of wastes at the site entrance; and
- damage to plant and equipment.

Such problems not only disrupt safe operation of the waste facility but can also have significant financial implications for the operator who will be required to replaced or repair stolen or damaged equipment.

Environmental damage can also result if control systems are compromised.

5.1 Operational Techniques

In order to minimise the risk of problems arising as a result of inadequate security, the following measures will be implemented at the site.

Building Security

The permanent site office, at the front of the site, will have the benefit of a security alarm to discourage intruders. Windows will also be fitted with bars and /or shutters to prevent damage by vandals.

Lighting

The permanent site office and hardstanding area will have security lighting to discourage unauthorised visitors during the hours of darkness.

Fencing

The site will have the benefit of perimeter fencing which will extend around the perimeter of the site.

Security Gates

Security gates, which span the full width of the access road will be provided at the entrance to the site. The gates will be locked outside operational hours to deter unauthorised vehicular and pedestrian access. Access to gate keys will be restricted to a small number of Roadstone employees.

Inspection

Gates and fencing will be inspected weekly by the Facility manager (or his nominated deputy), to identify deterioration and damage, and the need for any repairs.

Maintenance and Repair

The fencing and gates will be maintained and repaired when required to ensure their continued integrity. In the event that damage is sustained, a temporary repair will be made within 24 hours until permanent repairs can be affected.

Warning Notices

Notices warning against unauthorised access (and alerting potential trespassers to on-site hazards) will be erected at the site entrance and will be repeated as necessary at locations around the perimeter of the site.

Authorised Access System

All visitors to the site will be required to register their presence by signing in the visitor's book on entry to the site, and again on exit. This will minimise the risk of unauthorised visitors being present on site.

Reporting Systems

In the event of fly-tipped material being found at the entrance to the site, the fly tipped material will be examined for evidence of ownership. In the event of evidence being found, the Environment Protection Agency and/or Local Authority will be advised so that legal action may be considered.

5.2 Monitoring Techniques

The operational procedures outlined above, including the regular inspections, security and reporting systems will ensure continual monitoring of security provision at the site.

5.3 Action Plan

In the event of a breach of security at the site, the following course of action will be followed;

Unauthorised Access

The route of access will be determined, and consideration given to the following measures as appropriate: -

- repair of gates or fencing;
- replacement of gates or fencing with more secure design;
- erection of warning signs; and
- installation or implementation of additional security measures for example security cameras, more frequent patrols.

Unauthorised Tipping

- the material will be examined for evidence of ownership;
- the Environment Protection Agency and Local Authority will be informed;
- with the agreement of the Environment Protection Agency and/or Local Authority, the material will be removed and disposed of correctly;
- if appropriate, additional warning signs will be erected; and
- additional security measures will be considered.

Records

A record relating to the management and monitoring of security will be maintained. It will include the

following details: -

- records of the inspections and maintenance of security fencing and gates;
- a record of all breaches of security and incidents of fly-tipping, and investigations of these breaches of security; and
- details of the action taken to replace or repair security equipment, and investigate fly tipping, including any subsequent changes to operational procedures.

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Section 25:
Environmental Liabilities Risk Assessment Review

Waste Licence Compliance
(Condition 12.2.2 of W0269-01)

Inert Waste Recovery Facility
Fassaroe
Bray
Co. Wicklow

Environmental Liabilities Risk Assessment

Final Report

2nd February 2012
SLR Ref: 120229_501.00180.00028. Rev3

Roadstone Ltd
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11.0 introduction and background

11.1 Our Brief

SLR Consulting Ireland (SLR) was commissioned by Roadstone Wood to prepare an independent Environmental Liabilities Risk Assessment (ELRA) in relation to the company's Inert Waste Recovery Facility at Fassaroe, Bray, County Wicklow. The ELRA is required to comply with the waste licence[3] for the site granted by the EPA in April 2011. Previous correspondence between SLR and the EPA has determined that the EPA Guidance on ELRA suggests that a 'detailed ELRA' is not required for the site. However, Condition 12.2.2 of the waste licence requires an ELRA and Roadstone Wood has agreed to commission SLR to carry out this report.

11.2 About SLR Consulting

SLR CONSULTING is a major international multi-disciplinary environmental consultant, employing 900 staff in Ireland, the UK, North America, Australia and South Africa. In Ireland, the company trades as SLR Consulting Ireland, and employs around 30 environmental specialists, engineers and support staff at offices in Dublin and Hillsborough. Recent Clients of SLR include the European Union, national governments, government departments, international lending agencies, UK and Irish regional and local authorities / agencies, waste treatment technology providers and private sector waste management companies.
SLR employs the largest team of waste management experts in the UK and Europe. Around 150 staff in Ireland and the UK is employed on a full-time basis on waste management projects. Specialist staff are employed across 30 separate technical disciplines.

11.3 Site Description

The site covers an area of 21.4 hectares (51.5 acres). It is located entirely within the Townland of Fassaroe, Co. Wicklow, approximately 1.5km west of Bray town and 2km east of Enniskerry village (see Figure 1 below).
The site is located within an existing construction materials production facility operated by Roadstone Wood Ltd. The existing construction and demolition waste recovery facility is located at the northern end of the site, on lands which have been partially levelled. The quarry void currently being backfilled using inert soil and stone is located at the eastern end of the site.
Ground levels across the site follow that of the (original) surrounding ground, falling south-eastwards from approximately 95mOD to 74mOD (Malin), toward the Cookstown and Dargle Rivers. The quarry void that is currently being restored, covered an area of approximately 4.5 hectares (10.8 acres) and its depth from surrounding ground level varied from 18m at its northern / north-eastern end to 10m at its southern / south-eastern end.

[3] EPA licence number W0269-01, Condition 12.2.2.

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Aggregate processing and value added production activities are undertaken within the site in parallel with the waste recovery activities. The principal aggregate processing activity is the washing and screening of imported sand and gravel, while the principal value added activity is the production of ready-mixed concrete.

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Figure 5

Site Location

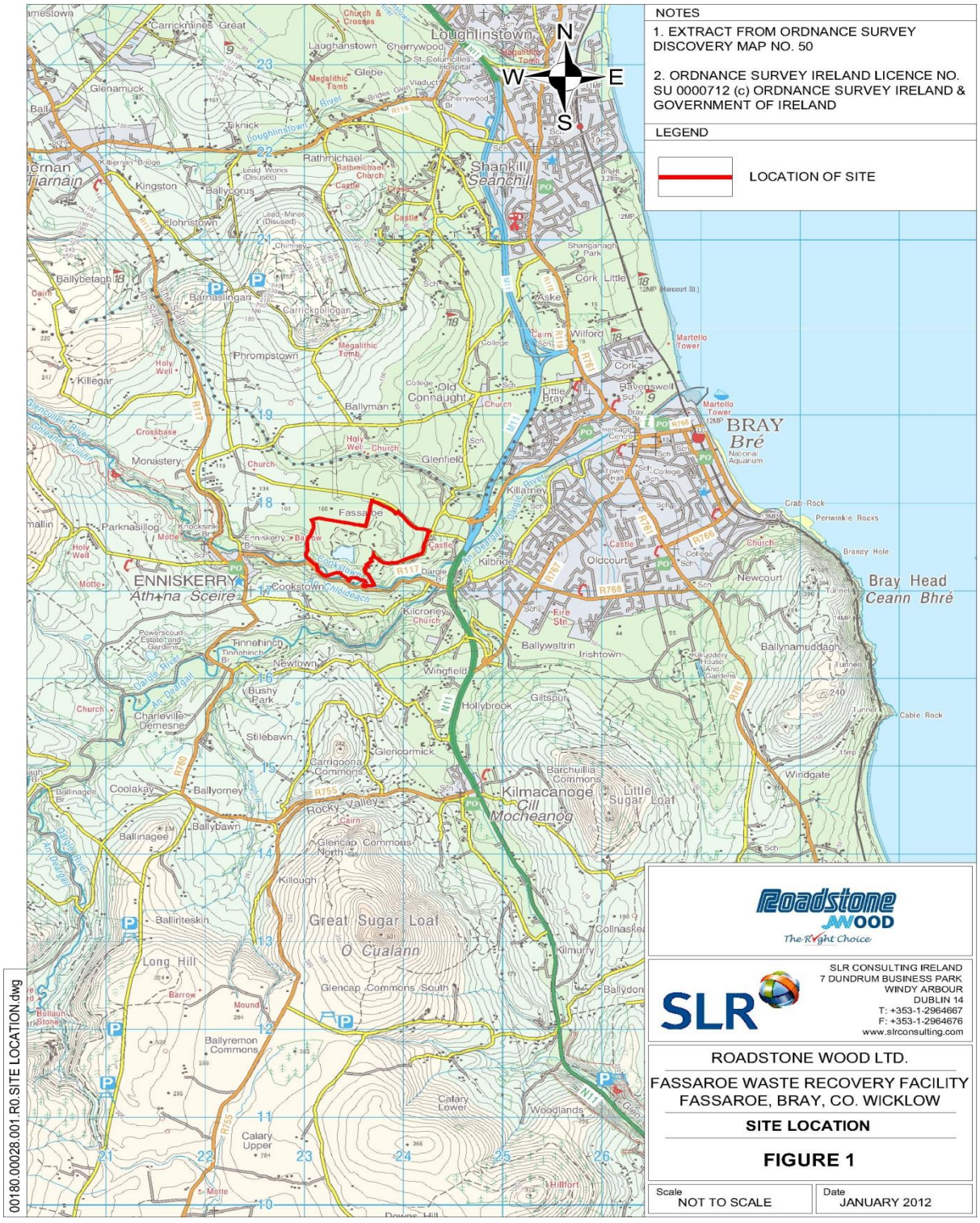

Figure 2 below shows a recent aerial view of the site as seen on Google Earth.

Figure 6
Aerial View of Site as seen on Google Earth

11.4 Surrounding Land Uses

The site, including the existing waste recovery facility, is located within a largely agricultural area.

The lands within Roadstone Wood's landholding, immediately to the north and east of the licensed site are typically used for crop growing while those to the north-west, west and south-east of the licensed site are set as grassland. The Cookstown River and R117 Regional Road between Bray and Enniskerry run some distance beyond and parallel to the southern property boundary. The ground sloping down to the Cookstown River is covered by dense tree growth.

Immediately beyond Roadstone Wood's landholding, the lands to the north-west and west are set as grassland, while there are a number of large, isolated residences located along the opposite side of Fassaroe Avenue, to the east and south-east of the landholding. There is also a cluster of residences located immediately north of the landholding, along either side of Berryfield Lane. Enniskerry FC's football pitch is located on the northern side of Berryfield

Lane. Although a large tract of land to the north of Berryfield Lane has been zoned for industrial and related uses, no development has yet taken place.

Other land uses in the immediate vicinity include a materials recovery facility for household, commercial and construction and demolition waste operated by Greenstar Ltd., approximately 400m beyond the north-eastern boundary of Roadstone Wood's landholding (Waste Licence Ref. No. W0053-01). There is an electricity substation and a number of telecom transmission towers located approximately 350m west of the site, along Berryfield Lane.

Existing land-use in the vicinity of the site, including locations of residences, is shown on the land-use map in Figure 3 below. Roadstone Wood's land ownership is highlighted, as is the extent of the waste licence boundary.

The Dublin City Council watermain carrying drinking water from the Roundwood reservoir to the city runs through the middle of the Fassaroe site, as shown on Figure 3. The watermain, by its nature, is pressurised, so it is not considered a potential receptor of environmental pollution at the site. Any leak in the pipe is expected to emit clean water rather than absorb potentially contaminated water.

The presence of the watermain through an operational facility has an inherent risk attached, but we consider that this risk relates to the potential damage of essential infrastructure rather than relating to environmental liabilities. Roadstone Wood are advised to take all reasonable measures to continue to preserve the integrity of the watermain on site, as has been the case for many years to date.

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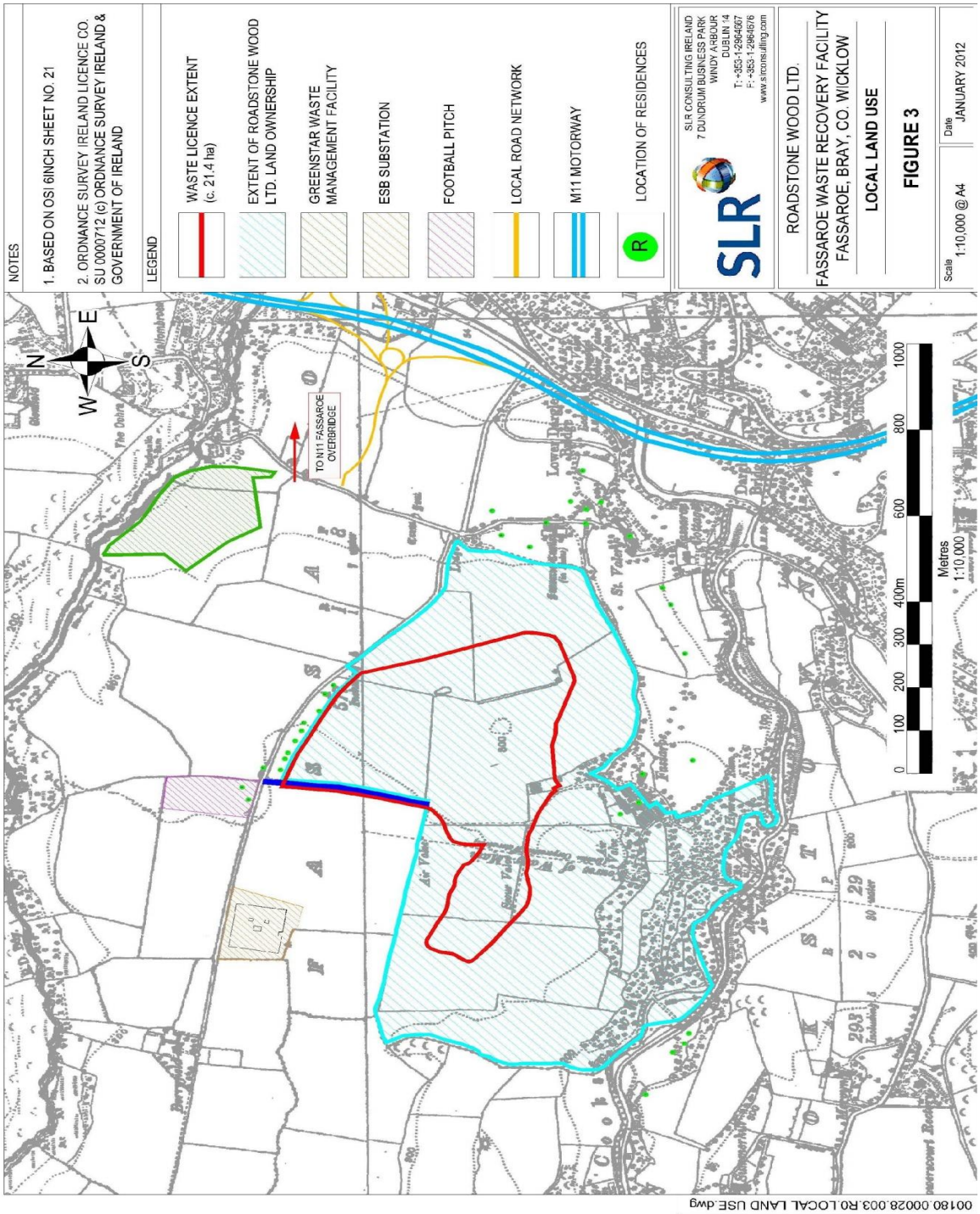
Figure 7

Surrounding Land Uses



11.5 Waste Recovery Activities

The inert waste recovery facility at Fassaroe is co-located with an existing concrete production facility on the same landholding. It shares existing site infrastructure with it, including site offices, staff facilities, internal roads, weighbridge, environmental control / monitoring infrastructure and maintenance sheds.

The waste licence allows acceptance of up to 550,000 t/a of soil and stones and dredging spoil plus 20,000 t/a of concrete, bricks, tiles and other inert construction and demolition wastes. The licence requires ongoing characterisation, compliance testing and verification to ensure that all wastes accepted at the facility are inert.

The inert waste recovery facility at Fassaroe, Bray Co. Wicklow provides for:

- Use of approximately 750,000 tonnes of imported and/or site won inert natural materials, principally excess soil, stones and/or broken rock excavated on construction sites, to backfill and restore a large existing void created by previous extraction of sand and gravel
- Recovery of imported inert construction materials, including stones, granular fill, concrete, blocks, bricks and ceramic tile, using crushing and screening equipment to generate secondary (recycled) aggregate
- 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
- Use of secondary aggregate to construct internal haul roads within and across the application site
- Sale and export of secondary aggregate off-site for re-use by others
- Phased restoration of the backfilled void (including placement of cover soils and seeding) and return to use as agricultural grassland
- Temporary stockpiling of topsoil and subsoil pending re-use as cover material for phased restoration of the site
- Environmental monitoring of noise, dust, surface water and groundwater for the duration of the site restoration works.

The existing quarry void is only backfilled using inert materials imported from pre-approved external construction sites and secondary aggregate generated on site. No peat, contaminated soils, intermixed construction and demolition waste or non-hazardous waste is accepted at the waste recovery facility. Any non-inert construction and demolition waste will be removed off-site.

11.6 Site Monitoring

The waste licence for the site requires monitoring for dust deposition, noise, surface water and groundwater at designated monitoring points strategically located on and around the site (see Figure 4 below).

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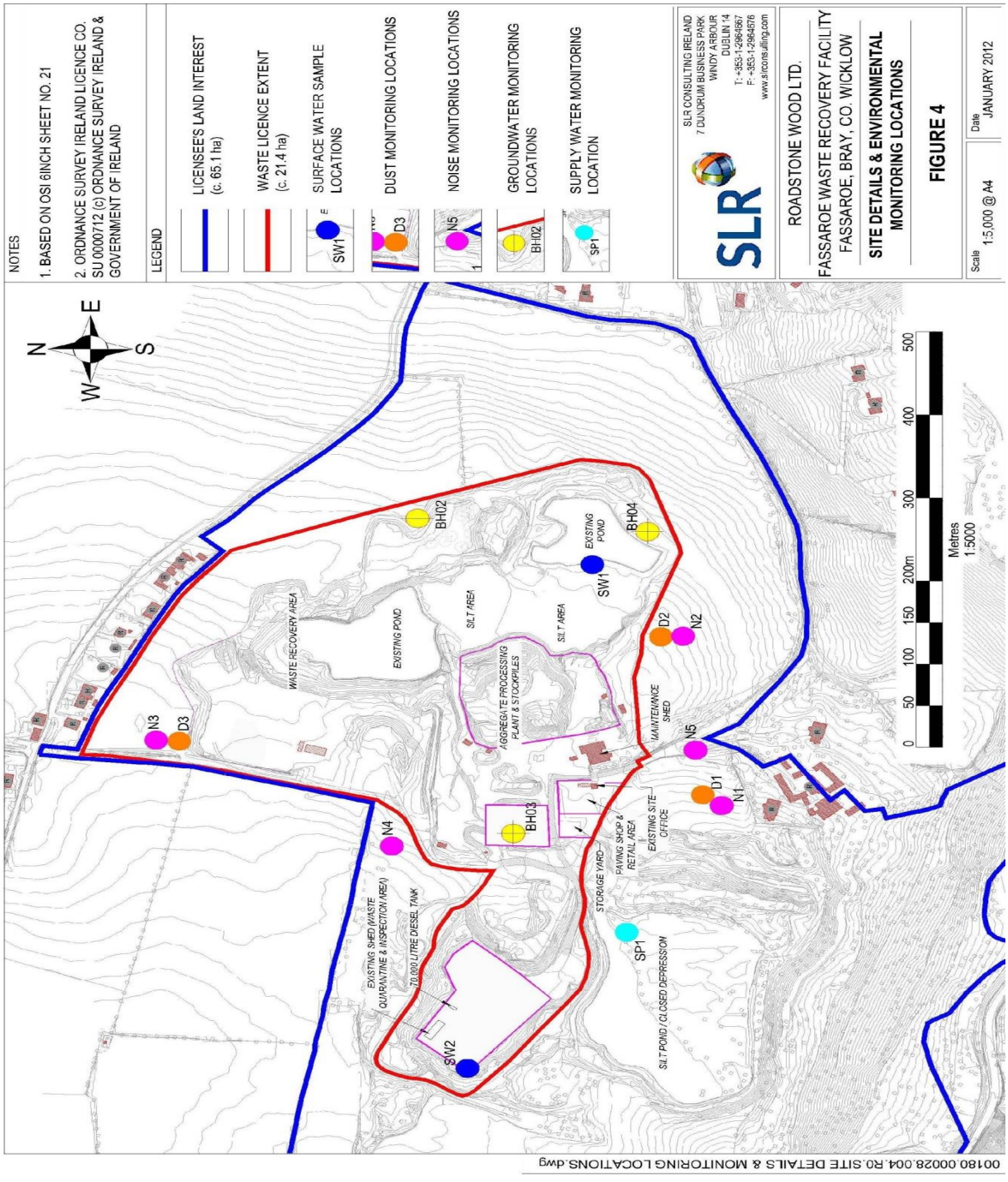
SLR has reviewed the 2011 monitoring data and found the site appears to be operating in compliance with the emission limit values set in the waste licence.
To date, the site has not been audited by the EPA.

Figure 8
Site Detail and Monitoring Locations



12.0 Initial screening and operational risk assessment

12.1 Introduction

In order to determine the requirements for an Environmental Liability Risk Assessment (ELRA), a relatively simple risk assessment decision matrix is employed to classify the site into one of three risk categories. The specific requirements for an ELRA are dependent on the resultant risk classification.

The decision matrix used to determine the risk classification for the Fassaroe waste recovery facility is that set out in Chapter 2 of EPA publication *Guidelines on Environmental Liability, Risk Assessment, Residuals Management Plans and Financial Provision.*[4] This decision matrix essentially looks at three key factors

(i) Complexity : a factor which takes account of the extent and magnitude of potential hazards due to the operation of the waste facility. A complexity band is assigned to the waste facility on the basis of look-up table in Appendix B of the EPA guidance document. Complexity ratings range from G1 for the least complex site to G5 for the most complex.

(ii) Environmental Sensitivity : a factor which takes account of the receiving environment in the immediate vicinity of the waste facility, with more sensitive locations given a higher score (due to proximity of aquifers, high quality surface water features or human receptors). Environmental sensitivity is assessed on a site specific basis using a matrix presented in Table 2.2 of the EPA guidance document.

(iii) Compliance Record : a factor which takes account of the compliance history of the waste facility and whether activities carried on are in compliance with licence requirements and emission limits.

Each of the three factors assessed above is multiplied to give the total score for the waste facility and this is used to place it into an appropriate risk category (identified as Category 1 to Category 3), as outlined in Table 2.1 below.

Table 12-1
Risk Category

Risk Category	Total Score
Category 1	< 5
Category 2	5 – 23
Category 3	> 23

[4] Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision, EPA (OEE), 2006.

Having determined the facility category, it is then possible to establish specific requirements for the ELRA and associated financial provisions.

12.2 Complexity

The complexity band assigned to the Fassaroe waste recovery facility is obtained from the look-up table in Appendix B of the EPA publication *Guidelines on Environmental Liability, Risk Assessment, Residuals Management Plans and Financial Provision.*
In this look-up table, Activity R4, recycling or reclamation of other inorganic materials, is classified as a Band G2 activity. This activity is equivalent to Activity R5 in the Fourth Schedule of the *Waste Management Acts 1996-2011*, recycling / reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials. [5]
A Band G2 activity is assigned a complexity factor of 2 by the EPA guidance document.

Complexity Factor = 2

12.3 Environmental Sensitivity

The environmental sensitivity of the waste recovery facility at Fassaroe is assessed using a matrix presented in Table 2.2 of the EPA guidance document. This matrix assigns an environmental attribute score to the facility under six separate headings

(i) Human occupation

(ii) Groundwater protection

(iii) Sensitivity of receiving waters

(iv) Air quality and topography

(v) Protected ecological sites and species

(vi) Sensitive agricultural receptors

Applying the criteria set out in Table 2.2 of the EPA guidance document, the environmental attribute scores for the Fassaroe facility for each of the six headings listed above are as shown underlined and bold in Table 2-2 below:

[5] The Third and Fourth Schedule of the Waste Management Act were amended in 2011 by S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011. The EPA guidance on ELRA and the Waste Licence for the Fassaroe facility were both based on the previous list of Recovery and Disposal Activities contained in the Third and Fourth Schedules to the Waste Management Act, rather than the recently amended list. For consistency with the EPA Guidance, the amended codes are not used in this report.

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Table 12-2
Environmental Sensitivity of the Fassaroe Site

Environmental Attribute	Environmental Attribute Score
Human Occupation[1]	
< 50m	5
50m - 250m	**3**
250m - 1000m	1
> 1km	0
Groundwater Protection [2,3]	
Regionally Important Aquifer	2
Locally Important Aquifer	**1**
Poor Aquifer	0
Vulnerability Rating - Extreme	3
Vulnerability Rating - High	**2**
Vulnerability Rating - Moderate	1
Vulnerability Rating - Low	0
Sensitivity of Receiving Waters [4]	
Class A	**3**
Class B	2
Class C	1
Class D	0
Designated Coastal & Estuarine Waters[5]	2
Potentially Eutrophic Coastal & Estuarine Waters[6]	1
Air Quality & Topography	
Complex terrain [7]	2
Intermediate terrain [8]	**1**
Simple terrain [9]	0
Protected Ecological Sites and Species [10]	
Within or directly bordering species protected site	2
< 1km to protected site	1
> 1km from protected site	**0**
Sensitive Agricultural Receptors [11]	
Fruit, vegetable or dairy farming < 50m from the activity footprint	2
Fruit, vegetable or dairy farming 50m - 150m from the activity footprint	1
Fruit, vegetable or dairy farming > 150m from the activity footprint	**0**

Environmental Attribute	Environmental Attribute Score
Total Environmental Sensitivity Score for Fassaroe Site =	**10**

Notes *
1. Measured from activity/footprint to public or private occupied building
2. Groundwater Classifications according to DoELG, EPA, GSI Groundwater Protection Schemes (1999)
3. Aquifer Classification Score to be added to Groundwater Vulnerability Score
4. Site located within catchments of EPA Surface Water Classification (1996) or adjacent to transitional water body
5. Designated as Sensitive Areas UWWT Regulations (2001)
6. EPA (2002) Water Quality in Ireland 1998-2000
7. Generally elevated terrain such as a mountain or the side of a valley, where receptors are at elevations above the stack tip elevation, US EPA (2000) Meteorological Monitoring Guidance for Regulatory Modelling Applications
8. Intermediate terrain where the elevations of receptors lie between the stack tip elevation and the plume rise elevation, US EPA (2000) Meteorological Monitoring Guidance for Regulatory Modelling Applications
9. Relatively flat terrain, where receptor elevations are between stack base and the stack tip elevations, US EPA (2000) Meteorological Monitoring Guidance for Regulatory Modelling Applications
10. Distance from activity/footprint to protected areas designated as pNHA (Irish Wildlife Acts 1976, 2000), cSAC (Habitats Directive 1992) and/or SPA (Birds Directive 1979).
11. Distances derived from UK Department for Environment, Food and Rural Affairs (2003), Local Air Quality Management - Technical Guidance LAQM.TG(3)

**** or more recent equivalent reference material***

Drawings and information supporting each of these assessments are available within the Environmental Impact Statement previously provided to the Agency in support of the waste licence application.

Adding the attribute scores identified above gives a total environmental attribute score of 10.

Applying the environmental sensitivity classification matrix set out in Table 2.3 of the EPA guidance document for a cumulative attribute score of 10, indicates that the overall environmental sensitivity of the site is 'moderate' (total score between 7 and 12) and that the corresponding environmental sensitivity factor is 2.

Environmental Sensitivity Factor = 2

12.4 Compliance Record of the Facility

The EPA guidance document indicates that the compliance factor for a newly licensed facility and those operating without non-compliance of emission limits (such as that at Fassaroe) may be classified as a Compliant / New Facility and have a compliance factor of 1.

Compliance Factor = 1

12.5 Risk Category

We multiply the scores for Complexity (2), Environmental Sensitivity (2) and Compliance Record (1) and reach a total score of 4. This falls within Category 1 in the EPA guidance Table 2.1, reproduced on Table 2-3 below:

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Table 12-3
Risk Category for Fassaroe Site

Risk Category	Total Score
Category 1	**< 5**
Category 2	5 – 23
Category 3	> 23

Risk Category = Category 1

Figure 1.1 of the EPA guidance document indicates that sites categorised under Risk Category 1 do not require site-specific ELRAs to address unknown liabilities. However, Condition 12.2.2 of the waste licence for the Fassaroe facility requires an ELRA to be carried out, so the remainder of this report contains a site-specific ELRA in compliance with the requirements of the waste licence.

13.0 site specific elra

13.1 Objectives and Scope

According to the EPA guidance document, the objectives of a site-specific ELRA are as follows:

- To identify and quantify environmental liabilities at the facility focusing on: unplanned, but possible and plausible events occurring during the operational phase.
- To calculate the value of financial provisions required to cover unknown liabilities
- To identify suitable financial instruments to cover each of the financial provisions; and
- To provide a mechanism to encourage continuous environmental improvement through the management of potential environmental risks.

The EPA advise that the ELRA should cover environmental risks leading to a potential or anticipated liability. Environmental risks will be deemed to cover all risks to: surface water, groundwater, atmosphere, land and human health.

13.2 Risk Classification and Identification

The EPA guidance recommends that risks are identified and classified following a *'Risk Management Workshop'* involving the facility management, environmental manager and independent environmental consultant. SLR Consulting visited the site on 7th December 2011 and on 20th January 2012 and on both occasions met with site staff to review the potential hazards for the ELRA.

SLR is very familiar with site activities and the site layout at Fassaroe, as we have provided consultancy services for the licensee at this site for the last decade or more. These services included preparation of an EIS and a Waste Licence Application in 2009.

13.2.1 Identification of Processes / Hazards

The waste handling processes carried out at the site inevitably generate noise and dust. Normal site operations should not produce leachate or effluent as all waste materials handled at Fassaroe are inert. The licensee is obliged to regularly characterise and test the incoming wastes to confirm that only inert materials are accepted.
There is potential for discovery of non-inert or potentially hazardous materials, hidden within incoming loads of inert compliant waste.
Storage of hydrocarbons in tanks and drums on site is also identified as a potential hazard.
Each of these potential hazards is addressed individually below.

Noise

The waste licence for the site sets an emission limit value of 55dB(A) for daytime levels at five specified monitoring points in the vicinity of the site and a level of 45dB(A) for night-time levels at the same monitoring locations. The licensee is obliged to monitor at these locations periodically, 'as required' by agreement with the Agency.
The licensee is obliged to report noise monitoring results to the EPA on an annual basis in the Annual Environmental Report (AER) for the facility. The first AER to be prepared since the licence was granted is due to be submitted before 31st March 2012. Whilst this report has not been finalised, we have reviewed the noise reports from surveys conducted in March and September 2011 and find that noise measurements at all locations at the site were compliant with the emission limit values set in the waste licence.

Dust

The waste licence for the site sets an emission limit value of 350 mg/m^2/day (30 day composite sample) for dust deposition levels at three specified monitoring locations on site. The licensee is obliged to monitor dust at these locations on a bi-annual basis, once during the May to September period.
Dust deposition results recorded in 2011 have not yet been submitted to the EPA. SLR has reviewed the dust deposition reports from nine surveys conducted during the period December 2010 to December 2011 and found that dust levels at all locations at the site were compliant with the emission limit values set in the waste licence.

Leachate

Inert wastes will not cause contamination, but there remains a risk that not all material received at the site is completely inert. The licensee is obliged to monitor surface water and groundwater at the site for a range of parameters agreed with the EPA.
The 2011 results of surface water monitoring suggest that the ponds on site appear uncontaminated and no contamination incidents were reported to the EPA since the licence was issued in April 2011.

Similarly, the groundwater monitoring results from 2011 suggest that the groundwater beneath the site appears uncontaminated and no contamination incidents were reported to the EPA since the licence was issued in April 2011.

Road Diesel Tank

The 70,000 litre road diesel tank, located in the Concrete Production Yard, is a potential source of contamination that must be considered in this risk assessment.

Minor spillages of diesel can usually be addressed by treatment with absorbent material contained in spill-kits that must be available on site as a licence condition.

Larger spills of diesel will enter the yard run-off drainage system and if unimpeded will be discharged to ground.

Condition 3.11 of the waste licence requires the licensee to install a hydrocarbon interceptor in the concrete production yard. The interceptor is currently on site and is due to be installed in the coming weeks.

The interceptor will contain some hydrocarbons, but discharge of a full 70,000 litre diesel tank will generate too great a volume for the interceptor to contain. In this scenario, the operator may be able to halt the discharge until such time as the diesel is collected. Failure to contain the diesel would result in contamination of the groundwater beneath the site and the licensee would be expected to be liable for the clean-up costs in this scenario.

Later in this report, we assess the risk of an occurrence of this nature.

Tank and Drum Storage

There is a requirement for storage of tanks and drums of various hydrocarbons on site. This includes gas oil, engine oil, transmission oil and hydraulic oil for maintenance and operation of machinery and mobile plant in addition to waste oil and oil filters.

These materials are stored within bunds in the maintenance shed in compliance with Condition 3.9 of the waste licence.

Minor spills of these materials can be contained locally and cleaned using spill-kits, located at a visible location in the maintenance shed. Major spills are unlikely as the volumes are relatively small (200 litre drums to 2,500 litre tank). However, if a volume is spilled and cannot be contained within the maintenance shed, the material will drain to a yard area where it is expected to percolate to ground rather than drain to the pond at the base of the quarry, approximately 200 metres downgradient. In either case, it could potentially contaminate the groundwater beneath the site.

13.2.2 Identification of Environmental Receptors

The processes and hazards described above have the potential to impact on environmental receptors such as those described below.

Employees or Other Site Users

Waste management facilities pose hazards to site operatives such as the risk of hearing injury from noise sources, respiratory issues associated with dust inhalation, exposure to hazardous chemicals or injuries from contact with vehicles, plant or machinery.

Occupied Houses

The nearest houses to site are located close to the northern site boundary on Berryfield Lane as shown on Figure 4 above. The licensee has maintained a 50 metre buffer zone between the footprint of the licensed area and the back gardens of these houses. Emissions of dust and noise from site processes have the potential to impact on the occupants of these houses.

Local Businesses

The closest businesses to the site comprise of Cahill's Mowers and Hannon Crash Repairs located within the group of houses at Berryfield Lane to the north of the site boundary. The Greenstar licensed[6] waste management facility is located approximately 400 metres northeast of the site.

Groundwater

The Fassaroe site is located on a locally important sand/gravel aquifer (Lg) that extends 4 to 5 km southwest to the Wicklow Mountains. The lack of surface water features across the area, indicates that the sand and gravel aquifer has a high level of recharge and a high permeability. Groundwater is classified as highly vulnerable because permeable strata are located close to the ground surface and there is potential for rapid movement of water through the ground.

The deep level groundwater aquifer in the sand and gravel has not been intercepted by the former quarry workings. There are a number of surface water ponds on the floor of the former quarry. These are formed by ponding of rainfall and surface run-off (drainage) above a layer of impermeable silt on the quarry floor. The silt is essentially an unwanted by-product of sand processing and washing elsewhere on the Roadstone Wood's lands. Available groundwater well information indicates that the ponds in the quarry floor are perched approximately 5m – 7m above the groundwater table in the sand and gravel aquifer.

The bedrock underlying the site is comprised of Ordovician Metasediments. The northern part of the site is comprised of the Maulin Formation, which is categorised as a locally important aquifer, productive only in local zones (Ll), whereas the southern portion of the site is comprised of the Glencullen River Formation, which is categorised as a poor aquifer, bedrock which is generally unproductive except for local zones (Pl).

Recent ground investigations indicate that groundwater quality at the site is generally very good, with established site operations shown to have no significant impact on existing groundwater quality.

Surface Water

The nearest watercourse to the site is the Cookstown River, which is named as the Glencullen River upstream of Enniskerry (2km west of the site). This watercourse is a tributary of the Dargle River, and is located within the Eastern River Basin District. The Cookstown River lies 200m to the south of the site access road. Ordnance Survey mapping indicates that this watercourse is fed by waters from the Glencullen area.

[6] EPA Ref: W0053

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In 2003 biotic sampling from the Glencullen River, 2km upstream of Enniskerry and 4km upstream of the site was reported to be of a good status (Q value of 4). Biotic sampling undertaken approximately 1km downstream of the site in the Cookstown River, just before it's confluence with the River Dargle also recorded good status (Q value of 4).

Ecological Designations

There are no designated or proposed Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or proposed Natural Heritage Areas (NHA's) within or contiguous to the site or Roadstone Wood's wider landholding. The nearest SACs to the site are the woodland at Ballyman Glen, approximately 600m north of the site (at its nearest point) and Knocksink Wood, approximately 2km west of the application site. The Dargle River Valley, approximately 1km south-east and south of the site and Powerscourt Woodland, approximately 1.5km south-west of the application site (at its nearest point) are both designated as proposed NHAs.

Ballyman Glen SAC is an east-west oriented valley which is bounded by steeply sloping pasture with gorse and areas of wood and scrub. The site is designated an SAC for its alkaline fen and petrifying spring, both habitats listed on Annex 1 of the EU Habitats Directive (92/43/EEC dated 21 May 1992 on *the Conservation of Natural Habitats and of Wild Fauna and Flora*).

Knocksink Wood SAC is situated in the valley of the Glencullen River. A number of scarce or rare plants occur within the site and it has one of the most diverse woodland invertebrate faunas in Ireland. The woodland incorporates wet woodland organisms threatened elsewhere within the EU. A notable feature of the site is the frequent and extensive springs and seepage areas within the wooded slopes. These petrifying springs are listed as a priority habitat on Annex I of the EU Habitats Directive.

The Dargle River Valley pNHA is located along a section of the River Dargle with steep wooded banks. The site is designated a pNHA as it is a fine example of a long established wooded valley, a habitat that is becoming rare in north County Wicklow. The site is also of considerable geological importance. At one point a well exposed series of Ordovician volcanic rocks are faulted against well-exposed Bray group Cambrian strata.

Powerscourt Woodland pNHA is located south-west of Enniskerry village and is largely contained within the Powerscourt and Charleville demesnes. The site includes a 4km stretch of the Dargle River. Mixed woodland covers most of the site and includes native and introduced species. The site includes many exotic plant species and habitats which support an interesting flora. The mix of semi-natural habitats and estate woodland is particularly conducive to macro-fungi.

Amenity Areas

The nearest outdoor amenity area to the site is compromised of a football pitch located just north of the site boundary on the opposite side of Berryfield Lane. This lies approximately 150 metres from the footprint of site activities.

13.3 Assessment of Risks

All potential environmental risks associated with the facility, as identified by SLR, are listed in the Project Risk Register presented on Table 3-1 below.

Table 13-1
Project Risk Register

Risk Ref. No.	Potential Failure Mode/Risk
1	Excessive dust emissions from site processes
2	Excessive noise emissions from site processes
3	Contamination from non-inert non-compliant waste
4	Road diesel tank leak or spillage
5	Other hydrocarbon spill (gas-oil, hydraulic oil, engine oil, transmission oil, waste oil, etc.)
6	Employee or visitor struck by vehicles or plant
7	Employee contact with hazardous materials

Table 3-2 below provides a classification of risks in terms of likely occurrence and estimated severity, as detailed in the EPA Guidance manual.

Table 13-2
Risk Classification Table

Rating	Occurrence		Severity
	Description	Probability (%) (in a 30 year period)	Financial Cost
1	Very Low	0-5	0 - €1,000
2	Low	5-10	€1,000 - €10,000
3	Medium	10-20	€10,000 - €50,000
4	High	20-50	€50,000 - €100,000
5	Very High	>50	>€100,000

The Risk Assessment Table provided in Table 3-3 below assigns a 'Risk Score' to the risks identified in the Project Risk Register based on the likely occurrence and severity of the event. The Risks are then ranked on that basis of the most serious to the least serious. At this point of the report, mitigation measures such as personnel protection equipment (ppe), staff training, spill kits, bunding, etc, are not considered when assessing the risks. These are addressed in the next section of this report, where use of such mitigation reduces the likely occurrence or severity of the risks.

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Table 13-3
Risk Assessment Table for Unmitigated Risks

Risk Ref. No.	Potential Failure Mode/Risk	Occurrence Rating	Severity Rating	Risk Score
1	Excessive dust emissions from site processes	3	3	9
2	Excessive noise emissions from site processes	3	4	12
3	Contamination from non-inert non-compliant waste	3	3	9
4	Diesel tank leak or spillage	3	5	15
5	Other hydrocarbon spill (gas-oil, hydraulic oil, engine oil, transmission oil, waste oil, etc.)	4	3	12
6	Employee or visitor struck by vehicles or plant	3	5	15
7	Employee contact with hazardous materials	2	2	4

The rationale behind the risk scores assigned above is as follows:

1. Excessive dust emissions from site processes:
The site does not appear to have a history of dust deposition problems and the nine sets of dust results from 2011 show compliance with the waste licence. However, a prolonged dry spell could cause dust nuisance, particularly for site employees. The likely future occurrence, without mitigation, is therefore considered 'medium'.
High levels of dust can impact on the health of employees, visitors and neighbours, depending on individual sensitivities. We consider that the severity of such a potential impact is 'medium'.

2. Excessive noise emissions from site processes:
The site appears to have a good compliance record in relation to the noise levels set in the waste licence. However, the data is limited, as the licence in new. It is possible that during a very busy period noise levels could be higher. The noise sources from waste management operations on site potentially include a crusher working alongside a bulldozer and HGV vehicles. The occurrence rating, without consideration of mitigation measures, is therefore considered 'medium'.
High levels of noise emissions can be a nuisance to neighbours, but more importantly can impair the hearing of site workers. Without mitigation, the severity of such an occurrence is considered 'high'.

3. Contamination from non-inert non-compliant waste
The Fassaroe facility can only accept inert wastes and the licensee is obliged to regularly characterise and test the integrity of incoming wastes. To date, this testing has found the incoming waste to be compliant. However, there remains potential for receipt of non-

conforming wastes hidden within compliant wastes. The probability of contamination occurring from non-compliant material is therefore considered to be 'medium'. Non-compliant waste could include hazardous substances, but only in small volumes, so the severity of contamination from such a source is considered 'medium'.

4. Diesel Tank Leak or Spill

The site contains a 70,000 litre road diesel tank that is used to fuel company vehicles. The tank is protected against damage and leaks by a mass concrete bund, so the likely occurrence of a major rupture to the tank is considered low. However, without mitigation, there is a 'medium' risk of spillage of diesel during re-fuelling operations. The volume and location of such spillage may depend on mitigation measures employed at the site.

Photo 1 - Bunded 70,000 litre Diesel Tank

The severity of a 70,000 litre diesel spill to the gravel aquifer at the site is considered 'very high' as the clean-up costs could run to more than €100,000.

5. Other hydrocarbon spill

There are a number of substances used on site that have the potential to cause environmental pollution if spilled. These include a 2,500 litre double-skinned tank for gas-oil (machine diesel) for fuelling mobile plant, a smaller waste oil tank and 200 litre drums filled with hydraulic oils, engine oils and transmission oils. These are all stored in the Maintenance Shed close to the site offices and are protected against leaks by bunding.

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Photo 2 – Bunded Oil Drums in Maintenance Shed

The 2,500 litre gas-oil tank consists of a self-bunded tank that is supported by the walls of a block-work bund (See Photo 3 below). There is a risk that a vehicle colliding with the bund wall would cause the tank to topple outside the bund and spill on the floor of the maintenance shed. The risk of such an occurrence is considered 'high'.

Photo 3 – Bunded Gas Oil (Diesel) Tank in Maintenance Shed

A spill of up to 2,500 litres of gas oil (diesel) in the maintenance shed would be directed to the adjacent yard area. This is an unpaved yard, so we expect a spill of this size to percolate to ground rather than drain to the downgradient site pond, located approximately 200 metres away. The severity of such an event is considered 'medium' with clean-up costs between €10,000 and €50,000.

6. Employee or Visitor Struck by Vehicles or Plant

Site activity is not intensive and there is little or no need for pedestrians in the active restoration areas. However, without proper management and mitigation measures, the likely occurrence is considered 'medium'.

The severity of an employee or visitor being struck by site plant or machinery, is considered to be 'very high' as such impacts can be fatal.

7. Employee Contact with Hazardous Materials

The site is a non-hazardous facility, so hazardous materials are limited to some substances used for maintenance purposes or non-compliant wastes found within reportedly inert deliveries. The likely occurrence of employee contact with such hazardous materials is therefore considered 'low'.

Unmitigated infrequent employee contact with small volumes of paints, solvents, oils, etc is likely to be restricted to skin irritation, so the severity of this risk is considered 'low'.

13.4 Risk Matrix

The ranking of the unmitigated risks identified above can be visualised on a 'Risk Matrix' diagram, as presented on Table 3-4 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. The colour code is as follows:

Red – These are considered to be high-level risks requiring priority attention. These risks have the potential to be catastrophic and as such should be addressed quickly.

Amber – These are medium-level risks requiring action, but are not as critical as a red coded risk.

Green - These are lowest-level risks and indicate a need for continuing awareness and monitoring on a regular basis. Whilst they are currently low or minor risks, some have the potential to increase to medium or even high-level risks and must therefore be regularly monitored and if cost effective mitigation can be carried out to reduce the risk even further this should be pursued.

Table 13-4
Risk Matrix of Unmitigated Risks

30 year Probability %		**Ranking of Unmitigated Risks**				
>50%	Very High 5					
20%-50%	High 4			**5**		
10%-20%	Medium 3			**1, 3**	**2**	**4, 6**
5%-10%	Low 2		**7**			
<5%	Very Low 1					
	Impact	Very Low 1	Low 2	Medium 3	High 4	Very High 5
	Estimated Cost	<€1k	€1-10k	€10-50k	€50-100k	>€100k

Occurrence

Severity

The Risk Matrix shows that Risk No. 4 (Diesel Spill) and Risk No. 6 (vehicle or plant impact) require priority attention as they have the potential for a catastrophic outcome. The other risks are lower priority, but all can be improved by mitigation as described in the next section of this report. Much of this mitigation is required by the waste licence and EPA enforcement action can be expected in the event of failure to implement many of these mitigation measures.

13.5 Identification and Assessment of Mitigation Measures

The risk levels identified above can be mitigated in a number of ways as discussed below.

1. Excessive dust emissions from site processes:

Site employees that work in the vicinity of sources of dust at the site should be issued with dust masks to avoid the inhalation of dust.

Where dust deposition at the site boundaries exceeds the emission limit values set by the EPA in the waste licence, the site operator should employ mitigation in the form of sprinklers and otherwise damping down of surfaces. We understand that there are sprinklers on site that are used when necessary.

A wheelwash and vehicle wash is employed at the exit of the waste recovery area and these lead to a road with a tarmac surface. This appears effective in minimising dust emissions from vehicles exiting the site.

These mitigation measures reduce the risk of occurrence of this event from 'medium' to 'low'.

2. Excessive noise emissions from site processes:

Site employees that work in the vicinity of noise sources on site should be issued with ear protectors.

Where noise emissions from the site exceed the emission limit values set by the EPA in the waste licence, the site operator should employ further mitigation in the form of improved working practices and/or better performing plant and machinery.

These mitigation measures reduce the risk of occurrence of this event from 'medium' to 'low'.

3. Contamination from non-inert non-compliant waste

The licensee regularly tests the integrity of the incoming wastes as required by a licence condition. SLR has reviewed this data and has concluded that the incoming wastes were compliant in 2011.

The licensee must continue to ensure that all wastes accepted at the site are inert and compliant with the requirements of the waste acceptance procedures.

The licensee must continue to be aware of the activities of the companies that deliver inert wastes to the site and maintain a high level of confidence about the source of the incoming wastes. Even non-hazardous wastes can cause groundwater contamination, so the licensee must ensure that only inert wastes are accepted at the site.

The licensee has provided a waste quarantine and contamination bay that consists of a building with mass concrete floor and walls (see Photo 4 below). Non compliant wastes can

be safely stored at this location prior to removal off-site for appropriate treatment or disposal to a licensed landfill.
These mitigation measures reduce the risk of occurrence of this event from 'medium' to 'low'.

Photo 4 – Quarantine and Contamination Bay

4. Diesel Tank Leak or Spillage

The 70,000 litre diesel tank is stored within a large concrete bund that is designed to contain more than the full volume of the tank. This provides mitigation against a major diesel spill at the site. An integrity test carried out in August 2011 showed that the bund is in very good condition and has capacity greater than 110% the capacity of the diesel tank.
The fuel pump located adjacent to the road diesel tank is designed to cut-out when the diesel tank of the vehicle is full, so avoiding over-spill.
Yard drainage passes through a pipe that runs beneath a concrete platform located adjacent to the concrete production plant. In the event of a major diesel spill in the yard, the licensee should have a mechanism in place to block that pipe and contain the diesel in the yard before it reaches the sump in the corner of the yard, from where surface water percolates to ground or is pumped to the water supply pond.

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The licensee is currently in the process of installing a Class II By-Pass Separator that will contain minor hydrocarbon spills or leaks emanating from the concrete production yard. The interceptor must be regularly inspected and adequately maintained.
These mitigation measures, when fully installed and properly maintained reduce the risk of occurrence of this event from 'Medium' to 'Low'.

Photo 5 – Yard Drainage Impeded by Concrete Platform

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Photo 6 – Hydrocarbon Interceptor Awaiting Installation

5. Other hydrocarbon spill

The gas-oil, hydraulic oils, engine oils, transmission oils, waste oils, etc. are currently stored within bunded areas in the maintenance shed. The operator must maintain adequate capacity in these bunds for them to be effective.

Spill kits comprising containment booms and absorbent materials are stored in the maintenance shed and are easily accessible in the event of a hydrocarbon spill or leak in the shed or from plant or machinery operating on the site.

The operator should improve the bunding of the 2,500 litre double-skinned gas-oil tank to reduce the risk of a spill caused by a minor vehicle collision. The frame that holds the tank in place should be supported from the ground rather than supported by the bund wall. In addition, the block-work bund should be replaced by a mass-concrete bund.

These measures would reduce the risk of occurrence from 'high' to 'low'.

6. Employee or Visitor Struck by Vehicles or Plant

No employees or visitors should be allowed in yard or outdoor working areas without wearing highly visible (hi-vis) jackets.

A low speed limit should be set and enforced on site.

Plant and machine operators must be made aware of personnel in the vicinity of the plant or machinery that they operate. They must also be fully trained in the operation of the plant and/or machinery that they are responsible for operating. We are informed by

Roadstone Wood that all employees have up to date QSCS tickets for the machines they drive.

All employees should be adequately trained in Health and Safety and acquire H&S certificates, where relevant. We are informed by Roadstone Wood that their H&S Officer carries out safety audits and training for site employees, as well as safety inductions for contractors working on the site.

Mobile plant, such as front loading shovels, should be fitted with reversing alarms that give a clearly audible signal.

Adequate lighting should be employed on-site during hours of darkness.

These mitigation measures, when fully maintained, reduce the risk of occurrence of this event from 'Medium' to 'Low'.

7. Employee Contact with Hazardous Materials

Employees that are at risk of coming into contact with hazardous materials on site should be issued with PPE including gloves and where appropriate, safety glasses. These employees should also be adequately trained in handling hazardous materials.

A waste quarantine area is provided in the concrete production yard and this should be used for storage of any non-compliant or hazardous wastes prior to removal off-site for safe disposal.

These mitigation measures, when fully maintained, reduce the risk of occurrence of this event from 'Low' to 'Very Low'.

13.6 Risk Reduction

By introducing the existing and recommended mitigation measures described above, the risks posed by the site activities are reduced. This risk reduction is detailed on Table 3-5 below where the resulting mitigated risks are assessed and ranked.

It is important that the site operator introduces all recommended mitigation measures to achieve the full risk reduction outlined in Table 3-5. Failure to do so will result in a risk that falls between the unmitigated and the mitigated positions.

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Table 13-5
Risk Reduction due to Existing and Proposed Mitigation Measures

RISK IDENTIFICATION			RISK ASSESSMENT						
			BEFORE CONTROL				AFTER CONTROL		
No.	Risk	Impact	Occurrence	Severity	Risk Level	Mitigation Measures	Occurrence	Severity	Risk Level
1	Excessive **dust** emissions from site processes	Potential impact on the health of employees, visitors and neighbours.	**3**	**3**	**9**	Site operatives should be issued with dust masks. Surfaces should be damped down during prolonged dry spells to keep yards and roads dust free. A wheelwash and vehicle wash is employed at the exit of the waste recovery area and these lead to a road with a tarmac surface.	**2**	**3**	**6**
2	Excessive **noise** emissions from site processes	Potential impact on the health of employees, visitors and neighbours.	**3**	**4**	**12**	Site operatives should be issued with ear protectors. Where noise emissions from the site are excessive, the site operator should employ further mitigation in the form of improved working practices and/or better performing plant and machinery.	**2**	**4**	**8**
3	Contamination from non-inert **non-compliant waste**	Potential contamination of locally important gravel aquifer.	**3**	**3**	**9**	The licensee must continue to ensure that all wastes accepted at the site are inert. The licensee must continue to be aware of the activities of the companies that deliver inert wastes to the site and maintain a high level of confidence about the source of the incoming wastes.	**2**	**3**	**6**

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RISK IDENTIFICATION			RISK ASSESSMENT						
			BEFORE CONTROL				AFTER CONTROL		
No.	Risk	Impact	Occurrence	Severity	Risk Level	Mitigation Measures	Occurrence	Severity	Risk Level
4	**Diesel tank** leak or spillage	Potential contamination of locally important gravel aquifer.	**3**	**5**	**15**	The 70,000 litre diesel tank is stored within a large concrete bund, which must be maintained. Spill kits comprising containment booms and absorbent materials should be stored on site and be easily accessible. The hydrocarbon interceptor currently awaiting installation should be installed and properly maintained. The licensee should have a mechanism in place to block the pipe under the concrete plinth to contain diesel spills in the concrete production yard	**2**	**5**	**10**
5	**Other hydrocarbon spill** (hydraulic oil, engine oil, transmission oil, waste oil, etc.)	Potential contamination of locally important gravel aquifer.	**4**	**3**	**12**	The operator must maintain adequate capacity in the bunds beneath the oil drums, by regular servicing. Spill kits comprising containment booms and absorbent materials are stored in the maintenance shed and are easily accessible. The operator should improve the bunding of the 2,500 litre gas-oil tank to reduce the risk of a spill caused by a minor vehicle collision. The frame that holds the tank in place should be supported from the ground rather than supported by the bund wall. In addition, the block-work bund should be replaced by a mass-concrete bund.	**2**	**3**	**6**

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Tallaght,
Dublin 24.

A.E.R. W0269-01

RISK IDENTIFICATION			RISK ASSESSMENT						
			BEFORE CONTROL				AFTER CONTROL		
No.	Risk	Impact	Occurrence	Severity	Risk Level	Mitigation Measures	Occurrence	Severity	Risk Level
6	Employee or visitor struck by **vehicles or plant**	Potential injury or fatality to employee or visitor.	**3**	**5**	**15**	Compulsory use of hi-vis jackets. A low speed limit should be set and enforced. Plant and machine operators must be made aware of other personnel on site and must be fully trained. All employees and contractors working on the site should be adequately trained in H&S. Mobile plant should be fitted with clearly audible reversing alarms. Adequate lighting should be employed, as required.	**2**	**5**	**10**
7	Employee contact with **hazardous materials**	Potential impact on health of employee.	**2**	**2**	**4**	Employees and contractors that are at risk of coming into contact with hazardous materials should be issued with appropriate PPE and should be adequately trained in handling hazardous materials. The waste quarantine area should be used to isolate hazardous materials found in the incoming wastes.	**1**	**2**	**2**

The identified risks all fall within the green zone after mitigation. The two highest risks remain as No. 4 (Diesel Tank Spill) and No.6 (Impact from vehicles or plant).

13.7 Mitigated Risks

Table 3-6 below shows the Risk Matrix for the facility after full mitigation is considered.

Table 13-6
Risk Matrix of Mitigated Risks

30 year Probability %		Ranking of Mitigated Risks				
>50%	Very High 5					
20%-50%	High 4					
10%-20%	Medium 3					
5%-10%	Low 2			**1, 3, 5**	**2**	**4, 6**
<5%	Very Low 1		**7**			
	Impact	Very Low 1	Low 2	Medium 3	High 4	Very High 5
	Estimated Cost	<€1k	€1-10k	€10-50k	€50-100k	>€100k

Occurrence

Severity

Each of the identified risks has a reduced likelihood of occurrence in the mitigated scenario. Compliance with the waste licence and health and safety legislation should ensure that the identified risks stay within the Green Zone (Low Risk) in the Risk Matrix.

14.0 Risk Management

14.1 General

The risks identified in the previous section must be managed to ensure that they remain in the Green Zone (low risk) category. The mitigation identified in this report requires ongoing inspection and management. The site requires a Risk Management Programme, whereby risks are allocated to 'Risk Owners', who have responsibility for maintaining or improving mitigation measures that are needed to minimise the risks.

14.2 Risk Management Programme

Table 4-1 below allocates the identified mitigation measures to 'Risk Owners'. The operator of the site should maintain and update a version of this Table to inform the Risk Management Programme at the facility. The job titles may differ from those suggested below, depending on the staffing structure at the facility, but the Programme should include the names and position of the 'Risk Owners'.

Table 14-1
Proposed Risk Mitigation Management Measures

Risk Owner	Mitigation Measure	Relevant Risk id	Mitigation Measure Completion Date
H&S Officer	Site operatives to be issued with dust masks.	1	
H&S Officer	Site operatives to be issued with ear protectors.	2	
H&S Officer	Compulsory use of hi-vis jackets.	6	
H&S Officer	All employees to be adequately trained in H&S.	1,2,6,7	
H&S Officer	Employees that are at risk of coming into contact with hazardous materials to be issued with appropriate PPE and to be adequately trained in handling hazardous materials.	7	
Waste Facility Manager	Surfaces should be damped down during prolonged dry spells to keep yards and roads dust free.	1	
Waste Facility Manager	Wheelwash and vehicle wash facilities should be maintained in working order	1	
Waste Facility Manager	Where noise emissions from the site are excessive, the site operator should employ further mitigation in the form of improved working practices and/or better performing plant and machinery.	2	
Waste Facility Manager	Continue to ensure that all wastes accepted at the site are inert.	3	
Waste Facility Manager	Continue to be aware of the activities of the companies that deliver inert wastes to the site and maintain a high level of	3	

Risk Owner	Mitigation Measure	Relevant Risk id	Mitigation Measure Completion Date
	confidence about the source of the incoming wastes.		
Waste Facility Manager	The concrete bund containing the road diesel tank must be properly maintained and periodically tested (every 3 yrs).	4	
Waste Facility Manager	Spill kits comprising containment booms and absorbent materials should be maintained in good order and be easily accessible.	4, 5	
Waste Facility Manager	The hydrocarbon interceptor currently awaiting installation should be installed and properly maintained.	4	
Waste Facility Manager	The operator should have a mechanism in place to block the pipe under the concrete plinth to contain diesel spills in the concrete production yard	4	
Waste Facility Manager	The operator must maintain adequate capacity in the bunds beneath the oil drums, by regular servicing.	5	
Waste Facility Manager	The operator should improve the bunding of the 2,500 litre gas-oil tank to reduce the risk of a spill caused by a minor vehicle collision. The frame that holds the tank in place should be supported from the ground rather than supported by the bund wall. In addition, the block-work bund should be replaced by a mass-concrete bund.	5	
Waste Facility Manager	Low speed limit to be set and enforced on site.	6	
Waste Facility Manager	Plant and machine operators to be made aware of other personnel on site and to be fully trained.	6	
Waste Facility Manager	Ensure that mobile plant is fitted with clearly audible reversing alarms.	6	
Waste Facility Manager	Adequate lighting to be employed, as required.	6	
Waste Facility Manager	Ensure that Waste Quarantine Area is used correctly	7	

14.3 Risk Management Review

The Risk Management Programme is a dynamic process that must be updated to reflect changes that occur on site. 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 site. Additional mitigation measures can become available or better techniques developed. The staff structure can change and new responsibilities allocated to the site management team.

15.0 assessment of potential environmental liabilities

15.1 Best Case Scenario

In the best case scenario, the mitigation measures will succeed in preventing any environmental liability, so the cost to the operator will be zero.

15.2 Worst Case Scenario

In the worst case scenario, a fatality could occur on site, most likely due to impact with a vehicle or an item of mobile plant. This is expected to incur a cost of up to €1,000,000, depending on the estimated loss associated with the potential future earnings of the individual. With full mitigation in place, the likelihood of occurrence of such a tragic event is considered low (<10% in 30 year period).

The possibility that 2 people could be struck and killed by an item of mobile plant, such as a reversing front loading shovel cannot be ruled out. The likelihood of occurrence of this event is considered to be less than 1% in a 30 year period and would be expected to incur costs of up to €2 million. The operator must have sufficient insurance to cover this eventuality, as a minimum.

The other risk with a very high severity relates to a spill of 70,000 litres of diesel reaching the gravel aquifer and requiring a major clean-up. We estimate that such an event could cost €100,000 or more to resolve. The probability of such an event is low as the diesel tank is contained in a mass concrete bund and the site operator, if vigilant, will have the opportunity to hold the diesel within the yard, even if the wall of the bund is breached.

There is currently a high risk of a spill of the 2,500 litre gas-oil tank located in the Maintenance Shed and such an event is likely to cost in excess of €10,000 to resolve. We include recommended mitigation measures in this report, that would reduce the probability of occurrence of this event from high to low.

15.3 Most Likely Scenario

The most likely scenario is based on the median probability and severity for each risk after implementation of the Risk Management Programme as shown in Table 5-1 below.

Table 15-1
Most Likely Scenario

Risk Identification		Occurrence Rating	Probability	Severity Rating	Cost Range	Median Probability	Median Severity	Most Likely Scenario Cost
1	Excessive **dust** emissions	2	5-10%	3	€10,000 - 50,000	7.5%	€30,000	€2,250
2	Excessive **noise** emissions	2	5-10%	4	€50,000 - 100,000	7.5%	€75,000	€5,625

3	Contamination from non-inert **non-compliant waste**	2	5-10%	3	€10,000 - 50,000	7.5%	€30,000	€2,250
4	**Diesel tank** leak or spillage	2	5-10%	5	€100,000 - 150,000	7.5%	€125,000	€9,375
5	**Other hydrocarbon spill** (maintenance shed)	2	5-10%	3	€10,000 - 50,000	7.5%	€30,000	€2,250
6	Employee or visitor struck by **vehicles or plant**	2	5-10%	5	€100,000 - €1m	7.5%	€550,000	€41,250
7	Employee contact with **hazardous materials**	1	0-5%	2	€1,000 - €10,000	2.5%	€5,000	€138
							Total	**€63,138**

16.0 conclusions

In consideration of the worst case scenario, we recommend that the site operator should have the following insurances in place as a minimum:

- Employers Liability – indemnified for at least €2 million (preferably higher).
- Public Liability – indemnified for at least €2 million (preferably higher).

In addition, the worst case scenario could incur environmental clean-up costs of c.€100,000, relating to a major uncontrolled diesel spill that reaches the gravel aquifer. However, the probability of such an occurrence is considered low (5% to 10% in a 30 year period).
The 'Most Likely Scenario', as detailed in Table 5-1 above, incurs an estimated cost of €63,138. The calculations used for this estimate, assume that all mitigation measures are in place and are maintained. The company must install the hydrocarbon interceptor in the concrete production yard, must improve the bunding and protection of the gas-oil tank in the Maintenance Shed and must properly maintain all mitigation infrastructure for this scenario to be realised. Otherwise the probability of occurrence of the identified risks are increased and the potential financial liability also increased.
Items No.6 and No.7 on Table 5-1 above should be covered by Employee Liability and Public Liability insurance.
Provision should be made by Roadstone Wood to cover the other items (No.1 to No.5 incl.) on Table 5-1 and these would incur an estimated cost of €21,750. In addition, the company should provide for any excess included in the insurance policies.
Roadstone Wood is part of the CRH Group of companies and is clearly in a strong position to offer a 'Parent Company Guarantee' to cover the risks identified above.

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Closure:

This report has been prepared by SLR Consulting Limited 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 Wood 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.

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