

ANNUAL ENVIRONMENTAL REPORT 2009
SUBMITTED TO ENVIRONMENTAL PROTECTION AGENCY
REPORTING PERIOD: JANUARY – DECEMBER 2009

ENVA
CLONMINAM INDUSTRIAL ESTATE
PORTLAOISE
CO. LAOIS

WASTE LICENCE NUMBER W0184-1

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ENVIRONMENTAL, HEALTH, SAFETY & QUALITY POLICY



Health, Safety & Environmental Policy

ENVA is a leading supplier of specialist waste & wastewater related products/services in Ireland and the UK. Our capabilities include waste treatment within our own sites, waste handling, emergency response services, the production and supply of chemical products for water treatment and other purposes, the design/installation of water treatment systems at customer sites, the provision of analytical services as well as other products and services associated with the above.

ENVA operates to OHSAS 18001 and ISO 14001 standards for occupational health and safety and environmental management. Compliance with all applicable legal HSE requirements are only a minimum starting point as we are committed to continually improving our performance in relation to health, safety and the environment.

We seek to do this by:

- Consulting our HSE committee (selected by our employees) on HSE matters.
- Identifying safety hazards including chemical hazards, assessing and managing these so as to minimise risk as far as practicable.
- Seeking to prevent ill health and occupational injury especially those arising from occupational exposure, manual handling, use of equipment/tools, slips, trips and falls.
- Minimising the need for and risks associated with confined space entry and hazardous materials.
- Providing safe places of work and healthy working conditions for employees and visitors.
- Promoting the provision of recovery options for waste in preference to direct disposal.
- Preventing pollution to any environmental media and minimising the environmental impact of emissions to water, land and air.
- Communicating with customers to ensure necessary information is provided and precautions are taken when collecting and handling waste, providing treatment or other services for customers..
- Being prepared for reasonably foreseeable emergency situations.
- Assessing and considering the performance of third parties used by us who may have potential for significant environmental impact.
- Using energy and natural resources efficiently.
- Communicating appropriately with our employees in relation to HSE matters and providing appropriate information and training
- Expecting the cooperation of our employees in relation to HSE management.

We will set improvement objectives and targets on an annual basis in order to achieve goals consistent with the above and monitor the implementation of these.


Declan Ryan, Managing Director

15/6/09
Date.

1.0 INTRODUCTION

1.1. General Description

Envva is located in an industrial estate, south of Portlaoise town. Businesses in the immediate vicinity of the plant are mainly light industries of a commercial nature such as vehicle repair and panel beating, light engineering, cable production and food wholesalers.

Since the granting of the waste management licence on the 16th of January 2004 activities on site have increased with an increase in the volume of packaged type wastes being accepted on site for export. The processing activities on site include waste oil re-processing, treatment of contaminated soil, repackaging of oily contaminated wastes and paint wastes. The site also stores wastes in packages (i.e. barrels ASPs, IBCs etc.) prior to transfer off site for recovery or disposal.

1.2 Waste Management Activities carried out at the Facility.

Third Schedule

Class 6. Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule.

Class 7. Physico-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcination) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule (including evaporation, drying and calcination).

Class 12. Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.



Class 13. Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

Fourth Schedule

Class 2. Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).

Class 4. Recycling or reclamation of other inorganic materials.

Class 5 Regeneration of acids or bases:

Class 8. Oil re-refining or other re-uses of oil. **(P)**

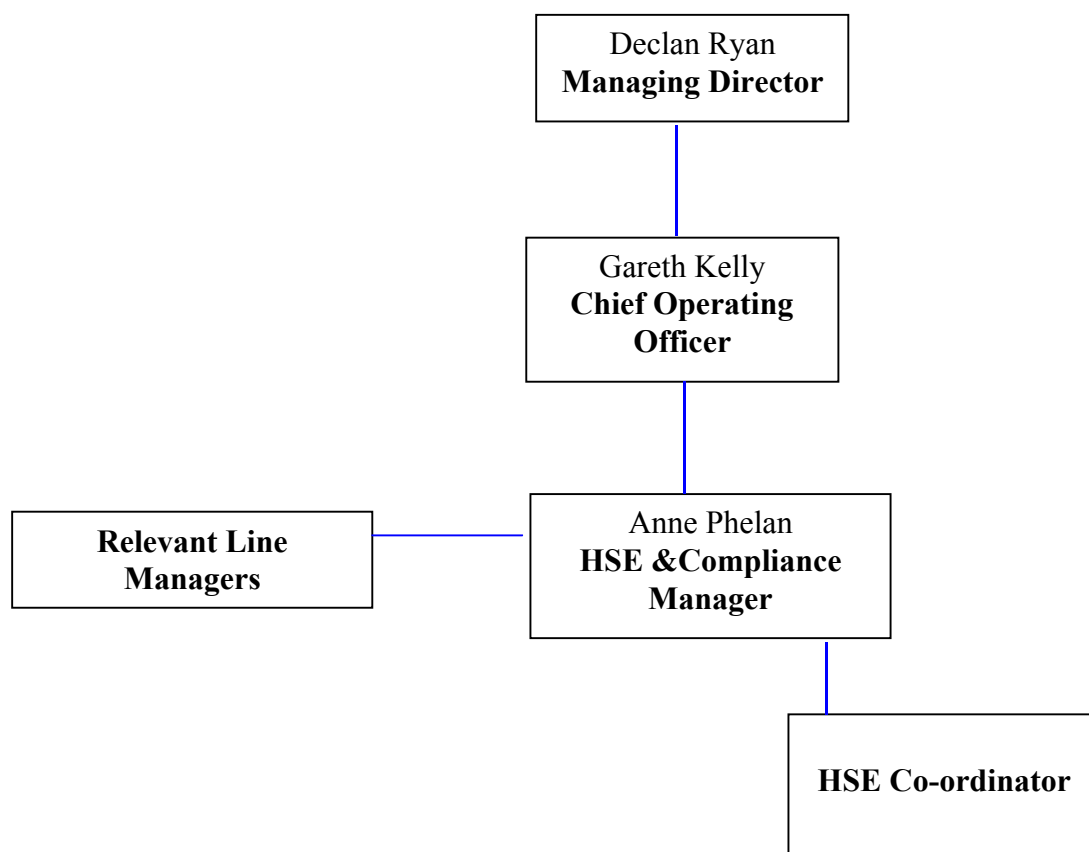
Class 9 Use of any waste principally as a fuel or other means to generate energy

Class 11. Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.

Class 12. Exchange of waste for submission to any activity referred to in a preceding paragraph of this Schedule.

Class 13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

1.3 Management Structure



2.0 WASTE ACTIVITIES

Quantities of waste to be accepted on site as detailed in Schedule A of waste licence 184-1.

Table 1 : Quantities of waste accepted on site in 2009

Waste Type	Quantity (tonnes per annum) Schedule A of 184-1	Quantity (tonnes per annum) 2009
Hazardous		
Waste oil and sludge's	35,000	21314.1
Contaminated soils	60,000	12428.33
Oil filters	1,000	743.26
Other hazardous wastes	5,000	3267.41
Total Hazardous	101,000	37753.09
Non-Hazardous		
Industrial sludges, Treated Sewage sludge, Waste water treatment sludge ^{Note a}	0	0
Other non-hazardous & non putrescible waste. ^{Note a}	9,000	71.13
Total Non-Hazardous	9,000	71.13
Total	110,000	37824.22

In 2009, 37753.09 tonnes of hazardous waste were accepted on site for treatment or for export off site. An additional 71.13 tonnes of non-hazardous waste was accepted on site for onward movement. Please see Section 2 for further details of wastes accepted, processed and exported off site.

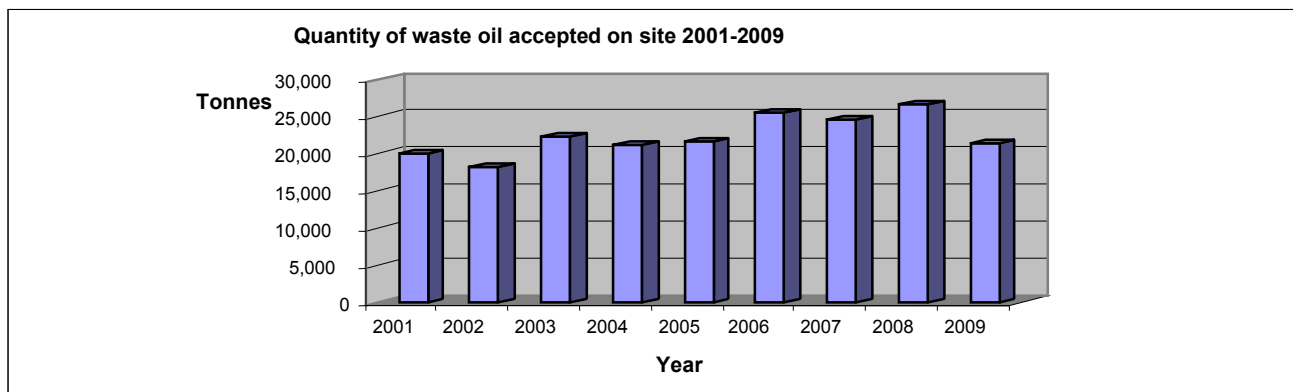
2.1 Waste Volumes Received

During 2009 the significant waste streams which were handled/processed on site were waste oils, solid oily wastes, contaminated soils, used metal filters and used batteries. Figures 2.1.1 to 2.1.5 detail the volumes of wastes handled/processed on site for the years 2001 to 2009 for each waste stream. Other waste streams were bulked up on site, stored and removed off site by TFS.

2.1.1 Waste Oils

Collection levels have shown a reduction on previous years, with 21314 tonnes the gross volume of waste oils accepted on site during 2009. The reduction in volume is due to the economic downturn experienced within the last year.

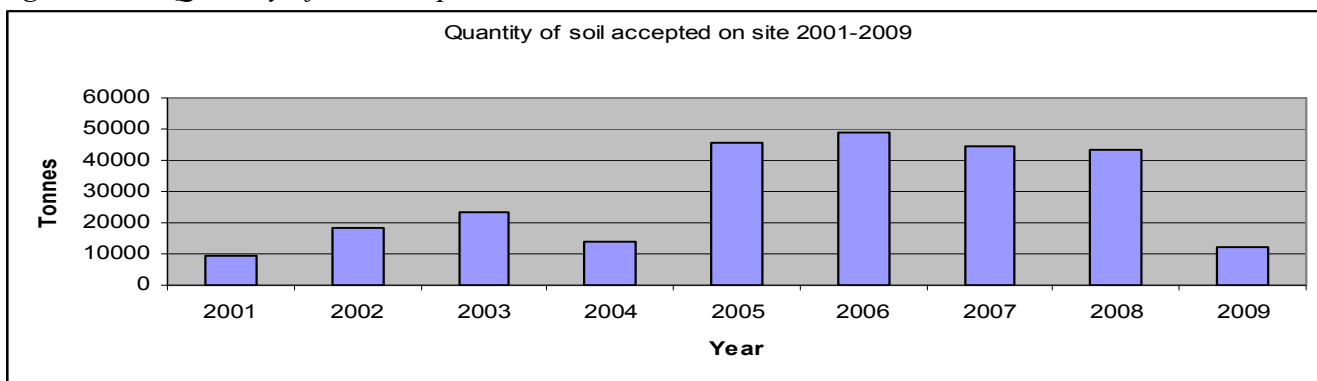
Figure 2.1.1: Quantity of waste oil received on site 2001-2009



2.1.2 Contaminated soil.

Enva accepts contaminated soils on site for treatment and onward export. 2005 saw a significant increase in the volume of soil accepted on site which was been maintained over the following three years. 12428 tonnes of contaminated soil was brought on site in 2009. This was a significant reduction in the volume of soil which came on site compared with the previous four years. The reduction in volume is due to the economic downturn experienced within the last year.

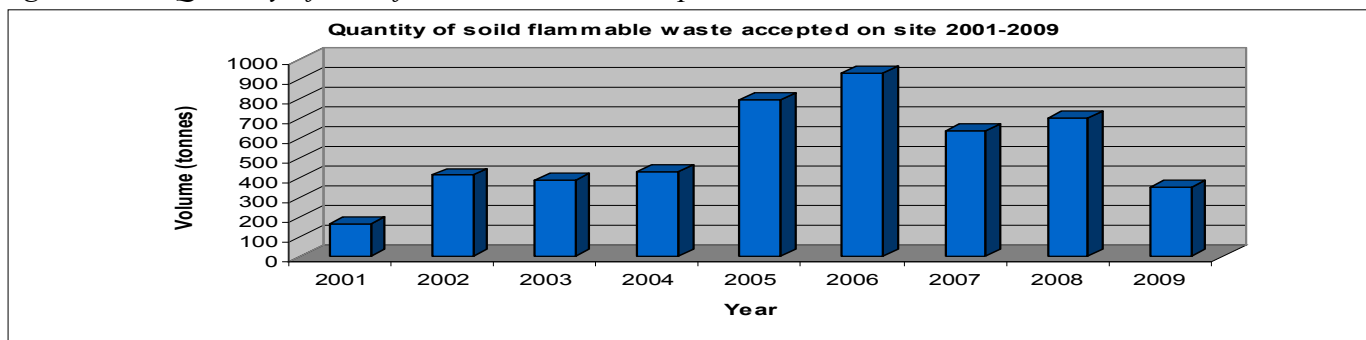
Figure 2.1.2: Quantity of soil accepted on site between 2001-2009.



2.1.3 Solid flammable Wastes

Solid flammable wastes are accepted on site, where they are bulked up, stored and/or re-packaged prior to being exported off site. There has been a significant decrease in the quantities of solid oily waste being accepted on site during 2009 in comparison to previous years. The reduction in volume is due to the economic downturn experienced within the last year.

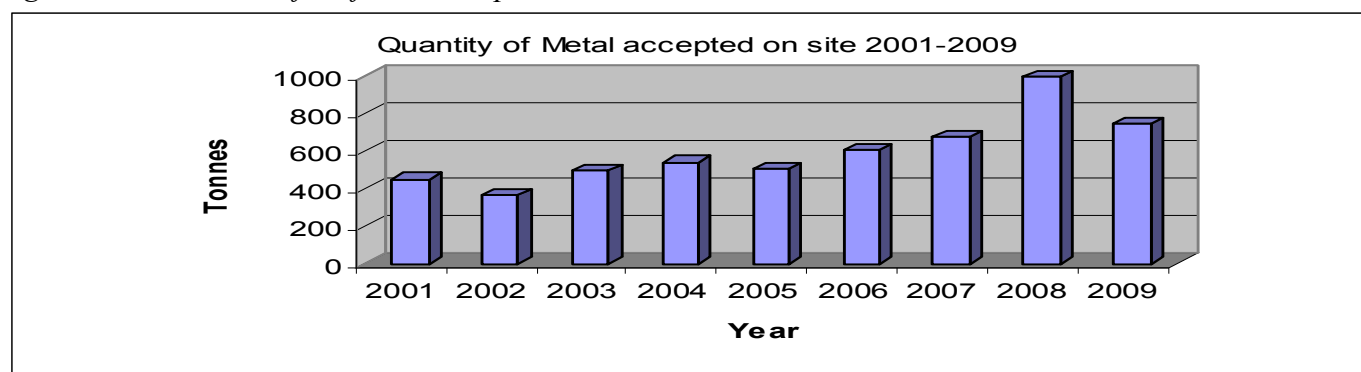
Figure 2.1.3: Quantity of solid flammable waste accepted on site in 2009.



2.1.4 Used metal filters

Metal filters are currently bulked up on site for export under TFS to RD recycling for metal recovery. Collection levels have shown a reduction on 2008 figures, with 743 tonnes of metal filters collected during 2009. The reduction in volume is due to the economic downturn experienced within the last year.

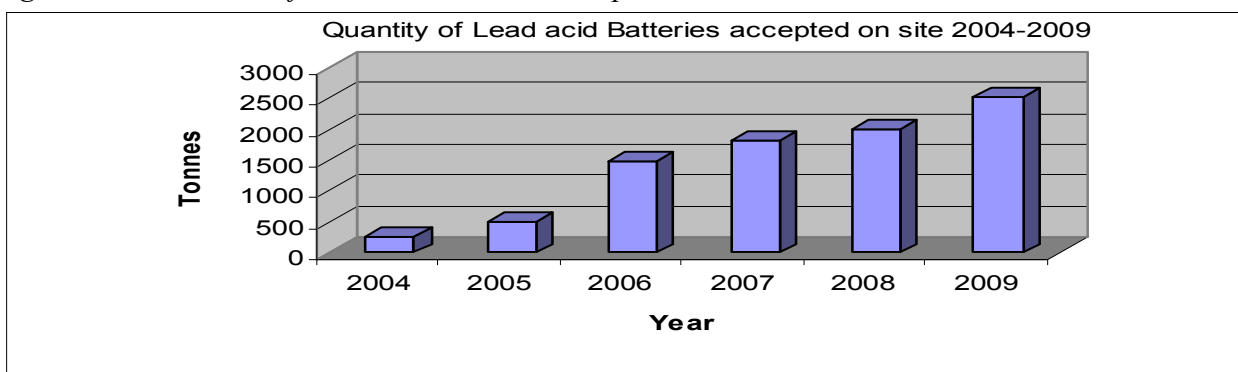
Figure 2.1.4: Volume of oil filters accepted on site in 2009.



2.1.5 Lead acid batteries

The quantity of lead acid batteries accepted on site has increased since Enva began accepting this waste stream in 2004.

Figure 2.1.5: Volume of lead acid batteries accepted on site in 2009.



2.1.6 Other wastes accepted onsite

Appendix 18 includes tables of other waste streams accepted on site between 2004-2008. The table below lists the other wastes accepted on site in 2009

Table 2: Other waste streams accepted on site in 2009

Waste Type	EWC Code	Quantities accepted 2009
Lead acid batteries	16 06 01*	2521.4
Ni-Cd batteries	16 06 02*	13.2
Other batteries and accumulators	16 06 05	0.89
Fluorescent tubes	20 01 21*	2.2
Hoses	16 07 08*	29.1
Antifreeze	16 01 15	47.4
Aerosols	16 05 04*	19.7
Paint and thinners	08 01 11*	24.7
Paint and paint cans	08 01 11*	75.4
Mixed Fuels	13 07 03*	66.2
Brake fluid	16 01 13*	4.5
Packaging contaminated with residues	15 01 10*	114
Vegetable Oil	20 02 25	0.395
Silver	09 01 02*	0.9
Discarded chemicals	16 05 07*	15.3
Resin	20 01 27*	4.5
Brakepads	16 01 12	8.5
Wastes not otherwise specified	13 08 99*	1
Acids	20 01 14*	0.04
Laboratory chemicals, consisting of or containing dangerous substances, including mixtures of Laboratory chemicals	16 05 06*	0.1
Discarded organic chemicals consisting of or containing dangerous substances	16 05 08*	0.2
Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12	16 02 13*	2
Waste metal filtercake	06 05 02*	22
Silica	16 05 09	0.3
Electronic waste	16 02 16	0.05
Ink	08 03 08	0.33
Tyres	16 01 03	0.31
Used cooking oil and grease trap waste	20 01 25	13.3

Note : Waste figures submitted in quarterly reports may vary due to reconciliation of waste volumes at year end.

2.2 Waste Volumes Sent Off Site For 2009

Appendix 19 includes tables of waste streams sent off site between 2004-2008. The table below details waste sent off site in 2009

Table 3: Waste sent off site in 2009

Waste	EWC Codes	Quantities transferred off – site 2009	Destination Used in 2009
Incoming 17 05 03* Soil which has been treated on the Enva Site and is sent off as 17 05 04	17 05 04	707.74	KTK, Brownstown and Carnalway, Kilcullen, Co. Kildare. W081-2
Incoming 17 05 03* Soil which has been treated on the Enva Site and is sent off as 17 05 04	17 05 04	9,862.32	Hinch Plant hire, Straboe, Portlaoise, Co Laois
Oil filters	16 01 07*	742.76	RD Recycling, Centrum Zuid 3017, 3530
Lead acid Baties	16 06 01*	2,569.08	Campine, Niljverheidsstraat 2, B- 2340 Beerse, Belgium.
Fluorescent tubes	20 01 21*	10.38	Dela, Alte Landstraße 4, D-45329, Essen, Germany.
Fluorescent tubes	20 01 21*	4.64	Irish Lamp Recycling, Woodstock Industrial Estate, Athy, Co. Kildare WFP-KE-08-0348-01
Solid Flammable waste	15 02 02*	0.51	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Solid Flammable waste	15 02 02*	302.45	Lindenschmidt, Krombacher Strasse 42-46, D57223 Kreutzel Germany.
Solid Flammable waste	15 02 02*	48.44	KWA, Graftstr. 25, 47475 Kamp-Lintfort,
Nickel Cadmium Batteries	16 06 02*	30.04	Accurec, Wiehagen 12-14 45472 Mulheim an der Ruhr, Germany
Paint and Thinners	08 01 11*	3.15	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Paint and Thinners	08 01 11*	57.50	Geocycle, Rue de Courriere 49, Zoning Industriel de Feluy, B 7181 Seneffe, Belgium
Paint and Thinners	08 01 11*	11.56	Enva NI, Unit 1, No. 11 Comber Rd, Carryduff, Co Down
Hoses come in as 16 07 08* and the waste oil is removed and the hoses are sent of site as	19 12 03	23.84	MSM Recycling, Belview Bulk Terminal, Gurteens, Slieverue, Co Kilkenny. WMP

19 12 03			02/2008.
Hoses come in as 16 07 08* and the waste oil is removed and the hoses are sent of site as 19 12 03	19 12 03	5.22	MSM Recycling, Unit 41 Cookstown Industrial Estate, Tallaght, Dublin 24. W079-1
Silver from photographic waste	09 01 02*	1.40	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Brakefluids	16 01 13*	4.48	KS Recycling, Raiffeisenstraße 38, D-47665 Sonsbeck, Germany
Aerosols	16 05 04*	17.60	SBH, Austrabe 5, D74238 Krautheim , Germany
Mixed fuels	13 07 03*	103.60	KS Recycling, Raiffeisenstraße 38, D-47665 Sonsbeck, Germany
Discarded chemicals	16 05 07*	15.28	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Resin	20 01 27*	4.46	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Hard Plastic Packaging	15 01 02	10.98	Leinster Environmentals, Clermont Park, Haggardstown, Dundalk Co. Louth. WP 2004/30
Hard Plastic mixed	17 02 03	2.14	Leinster Environmentals, Clermont Park, Haggardstown, Dundalk Co. Louth. WP 2004/30
Metal packaging	19 12 03	4.26	Hegarty Metals Ballysimon road Limerick. WP 05-04
Metal packaging	19 12 03	45.04	MSM Recycling, Belview Bulk Terminal, Gurteens, Slieverue, Co Kilkenny. WMP 02/2008.
Reused IBCs	15 01 02	28.89	Recovery as packaging for waste
packaging	15 01 10*	3.50	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Wastes not otherwise specified	13 08 99*	1.00	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Acids	20 01 14*	0.04	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1

Laboratory chemicals consisting of or containing dangerous substances including mixtures	16 05 06*	0.10	Enva, Smithstown Industrial estate, Shannon, Co. Clare.
Discarded organic chemicals consisting of dangerous substances	16 05 08*	0.18	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Antifreeze	16 01 15	24.46	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Mixed batteries	16 06 05	18.18	Accurec, Wiehagen 12-14 45472 Mulheim an der Ruhr, Germany
Silica	16 05 09	0.34	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
ink	08 03 08	0.40	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Tyres	16 01 03	0.60	Crumb Rubber, Mooretown, Dundalk, Co Louth. WP 2007/01
Plastic from contaminated packaging	15 01 02	10.98	Leinster Environmentals, Clermont Park, Haggardstown, Dundalk Co. Louth. WP 2004/30
Plastic from contaminated packaging	17 02 03	2.14	Leinster Environmentals, Clermont Park, Haggardstown, Dundalk Co. Louth. WP 2004/30
Used cooking oil waste	20 01 25	23.40	BIP PO Box 3180, Tat Bank Rd., Oldbury, West Midlands, B69 4PG, United Kingdom.
Used cooking oil waste	20 01 25	116.30	Beofs, Camphill Community, Ballytobin, Callan, Co. Kilkenny
Used cooking oil waste	20 01 25	1.73	Enva, Smithstown Industrial estate, Shannon, Co. Clare. W041-1
Used cooking oil waste	20 01 25	1.13	Agri Energy/AIBP Kilcommon, Cahir, Co Tipperary.
Waste metal filter cake	06 05 02*	22	KMK, Cappincur Industrial Estate, Daingean Rd., Tullamore, Co. Offaly.
Sludges	13 05 02*	158.6	Geocycle, Rue de Courriere 49, Zoning Industriel de Feluy, B 7181 Seneffe, Belgium



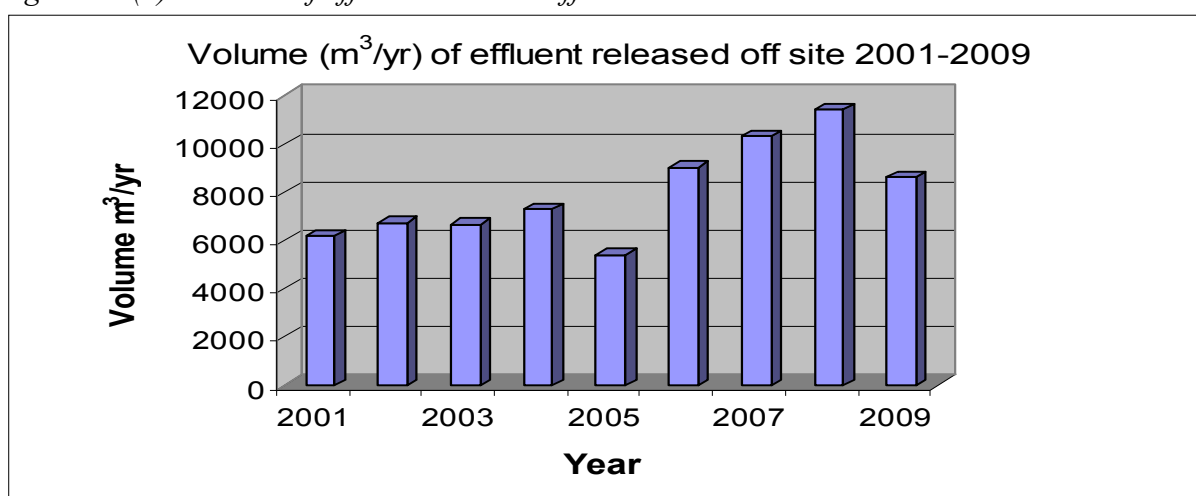
Products produced from Waste			
Recycled fuel oil (11LS)	N/A	13,308.48	Reused as a fuel
Incoming 17 05 03* Soil and stone which has been treated on the Enva Site and is reused as a stone filler by Enva customers	N/A	2,303.26	Re use as filler material

3.0 EMISSIONS

3.1 Effluent Emissions monitoring (Monitoring location FS 1)

The trend in the volume of effluent generated on site between 2006 and 2008 was increasing however 2009 saw a reduction in the levels of effluent generated. This reduction in effluent can be attributed to the reduced volume of waste oil which was accepted on site in 2009 in comparison to previous years.

Figure 3.1(a): Volume of effluent released offsite



The Figures below illustrate the trends in the monitoring results of the parameters which effluent was tested for during 2009. Appendix 2 details the Quarterly effluent metal screen results for each quarter of 2009. Appendix 17 contains the results of the respirometry testing performed in 2009.

There was one exceedence in the limit value for Sulphates as can be seen in figure 3.1(d) below. Please refer to section 5 *Non Conformances* of this report for details. Monitoring results for all other parameters were below the licence limits.

Figure 3.1(b): Copper, lead, Zinc and Cadmium levels in effluent for 2009.

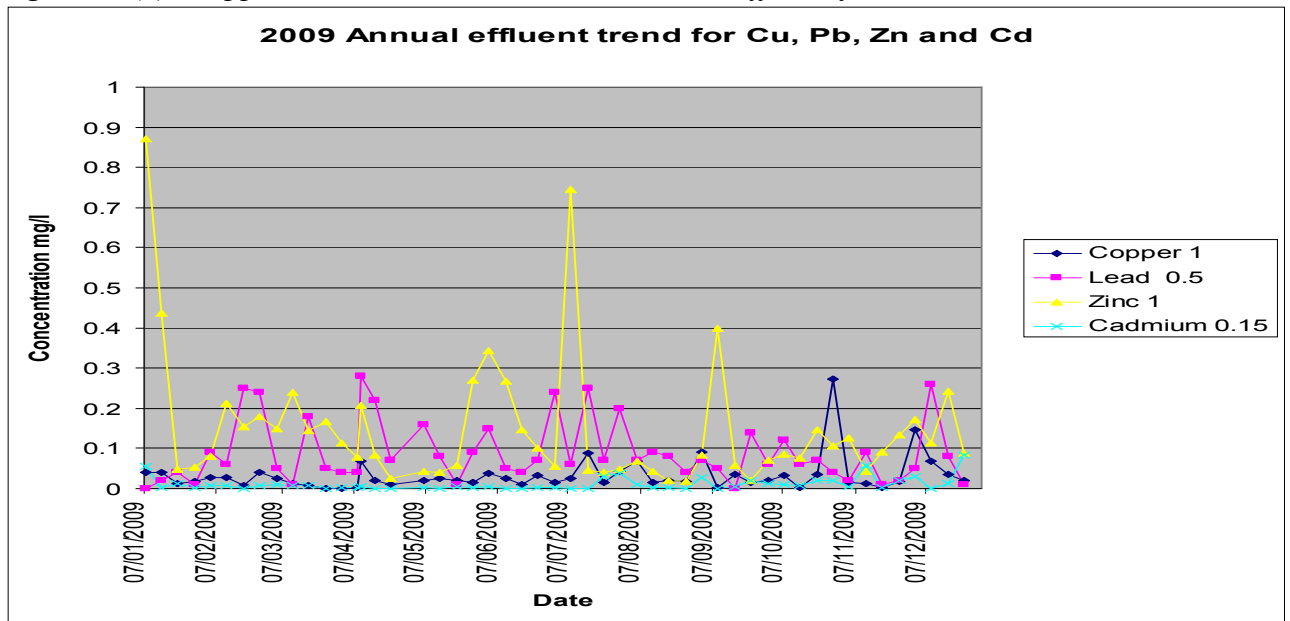


Figure 3.1(c): Daily Effluent COD levels for 2009.

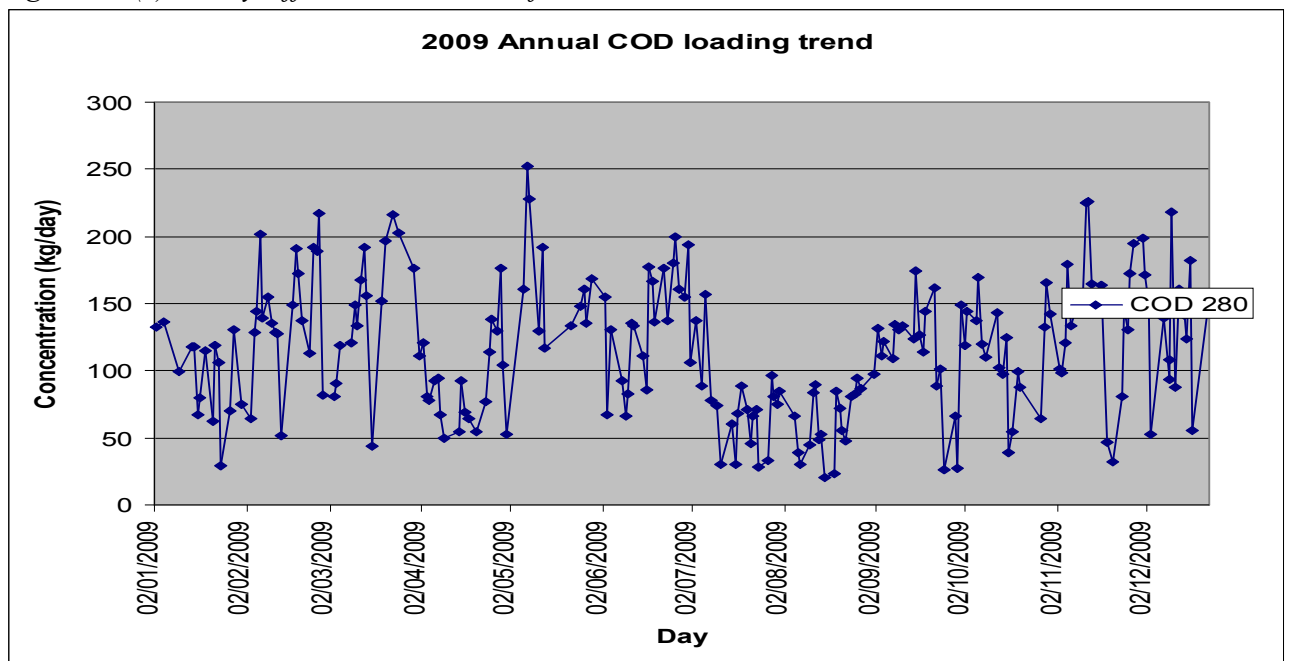


Figure 3.1(d): Sulphate and Ammonia levels for 2009

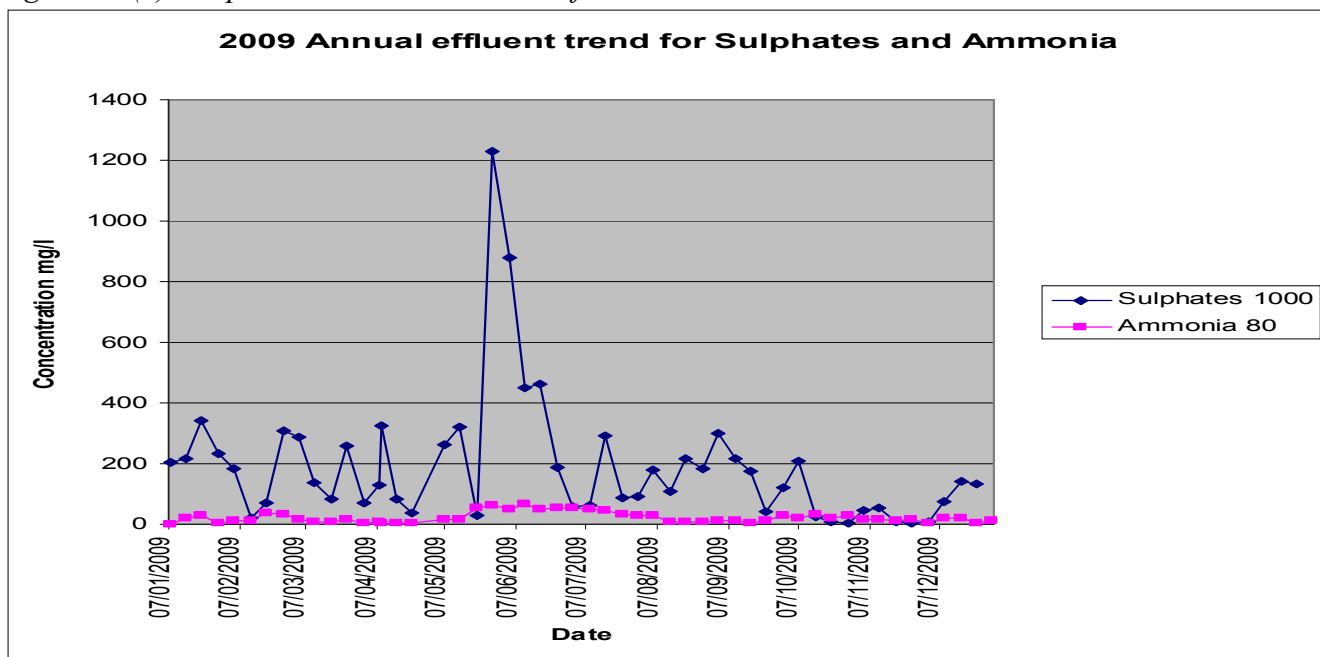


Figure 3.1(e): Phenol levels in effluent for 2009

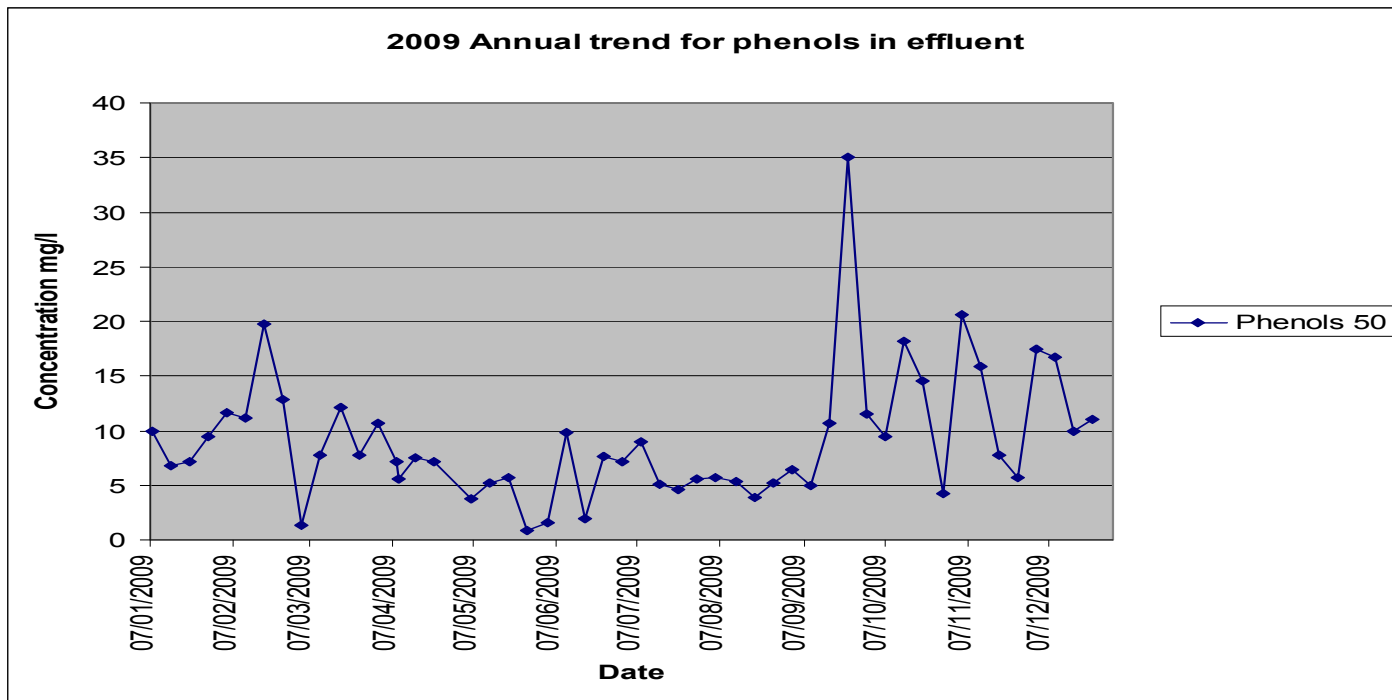


Figure 3.1(f): FOG levels in effluent for 2009

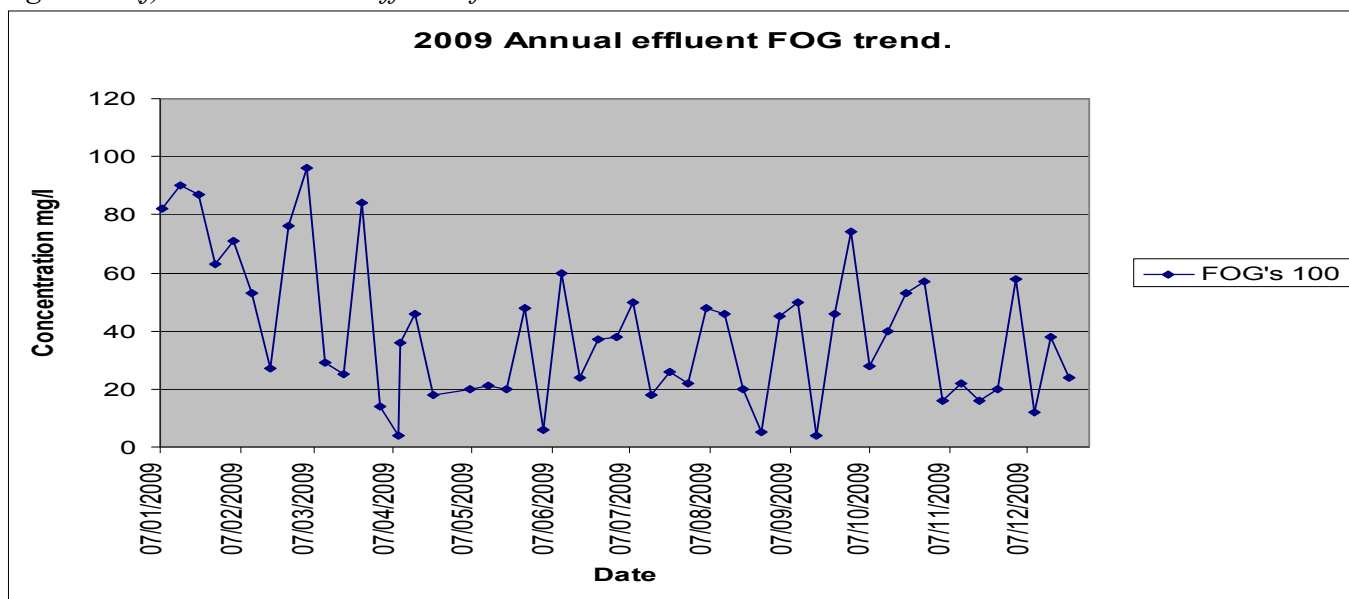


Figure 3.1(g): Total Phosphorous levels in effluent for 2009

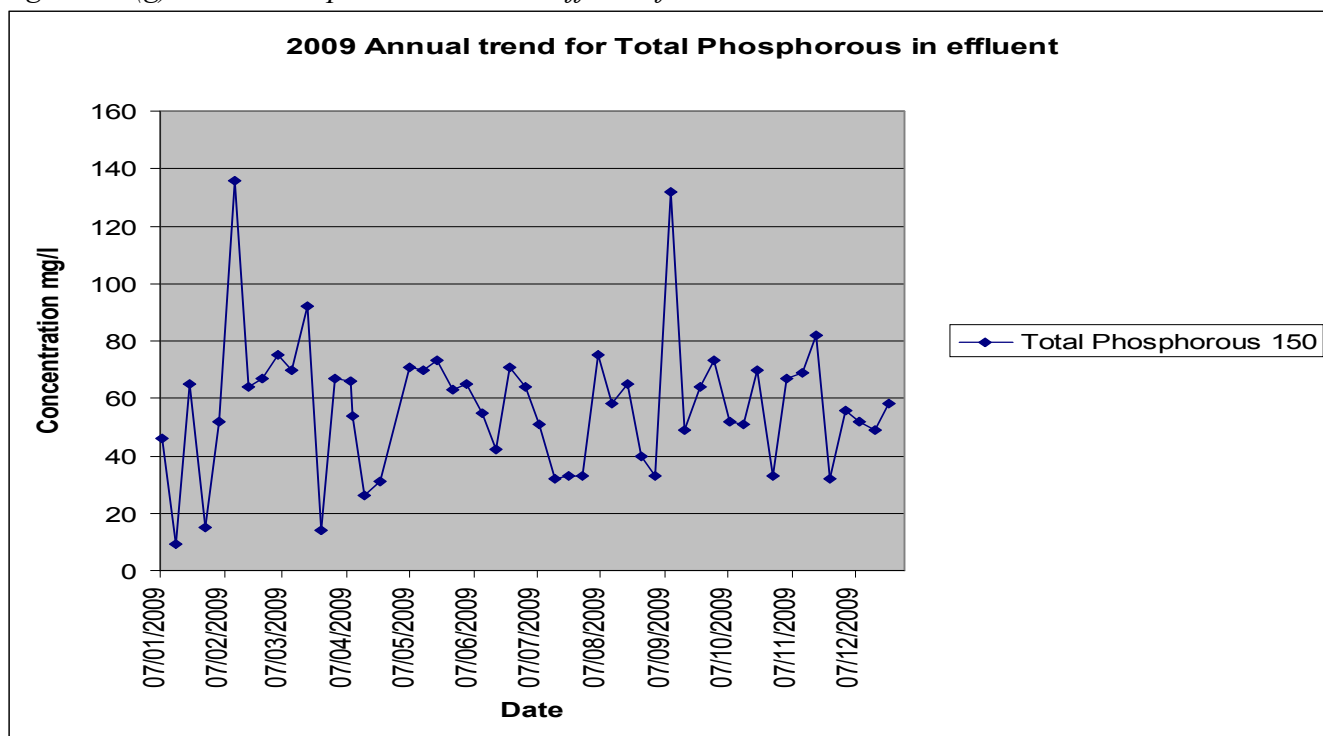


Figure 3.1(h): Chloride levels in effluent 2009

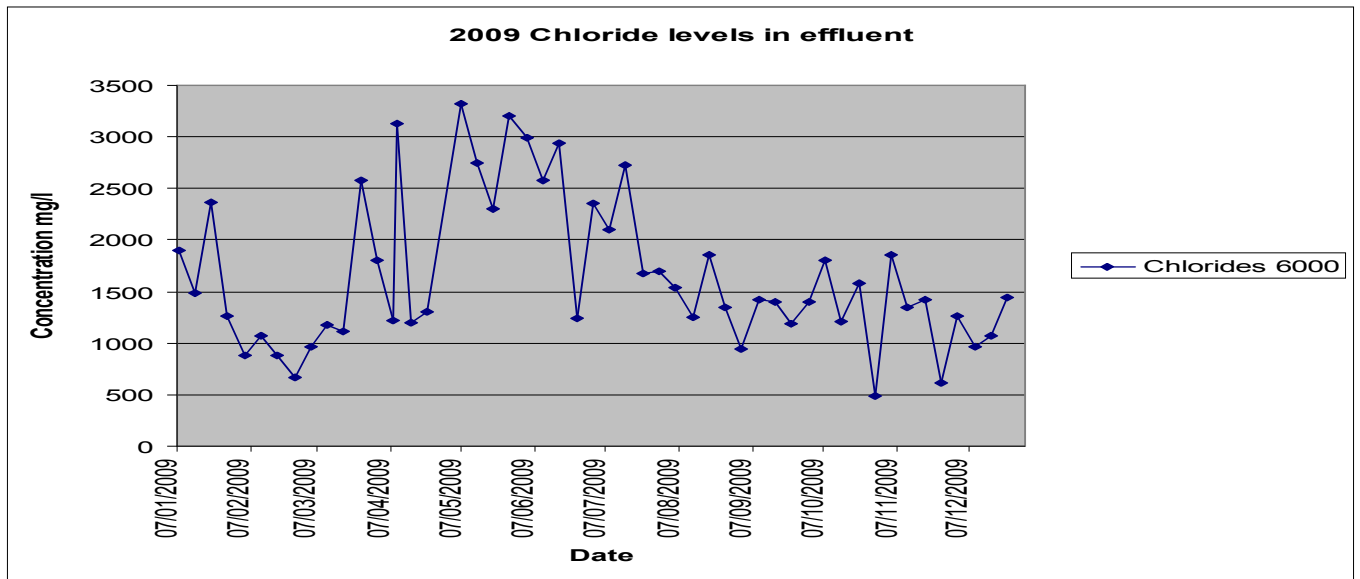


Figure 3.1(i): pH levels in effluent 2009

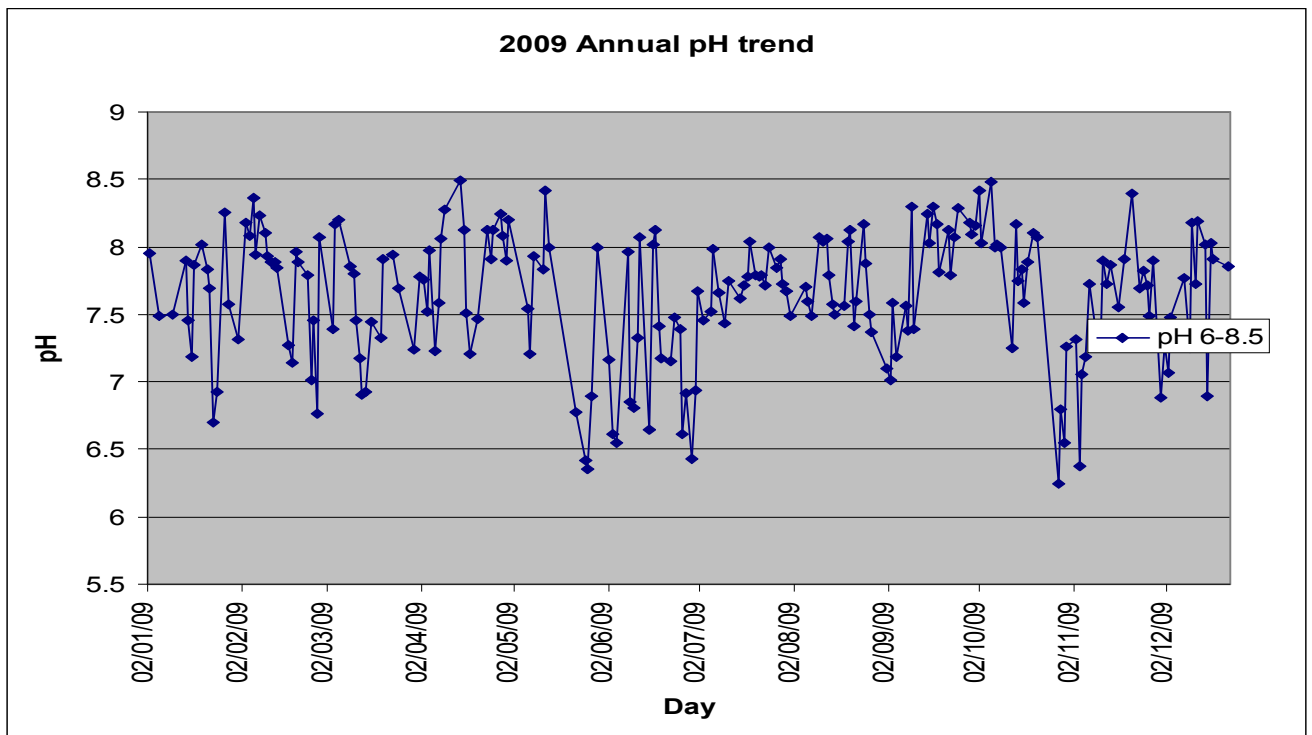


Figure 3.1(j):Suspended Solid levels in effluent 2009

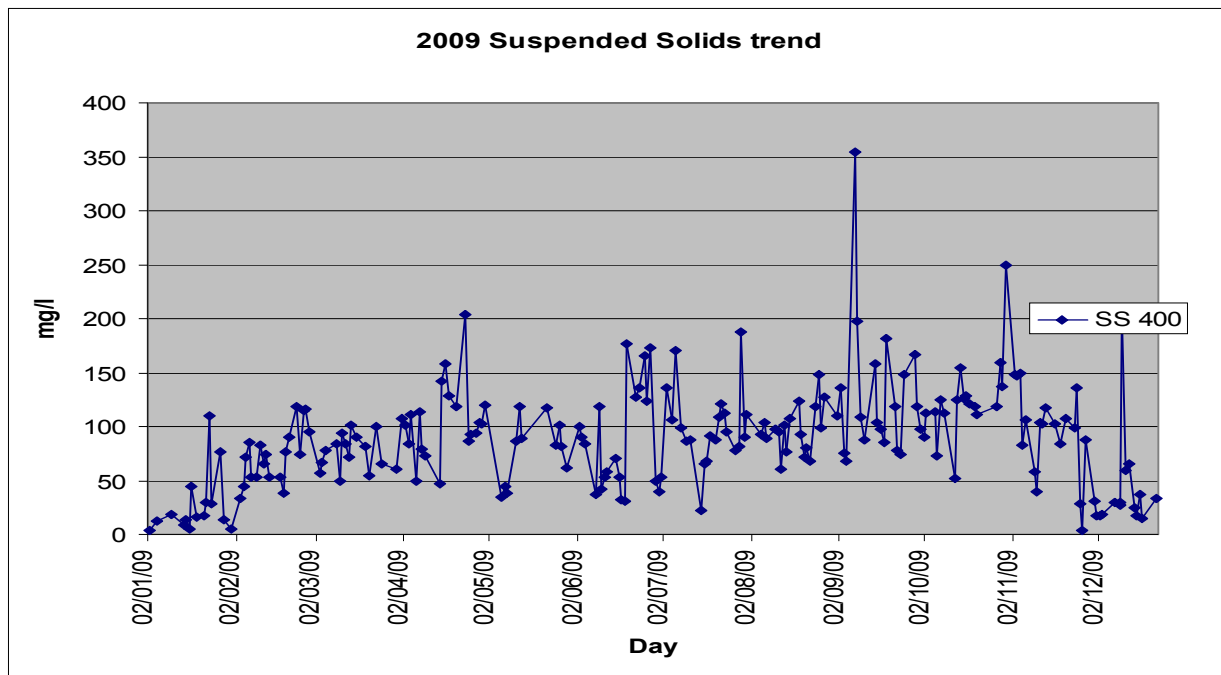
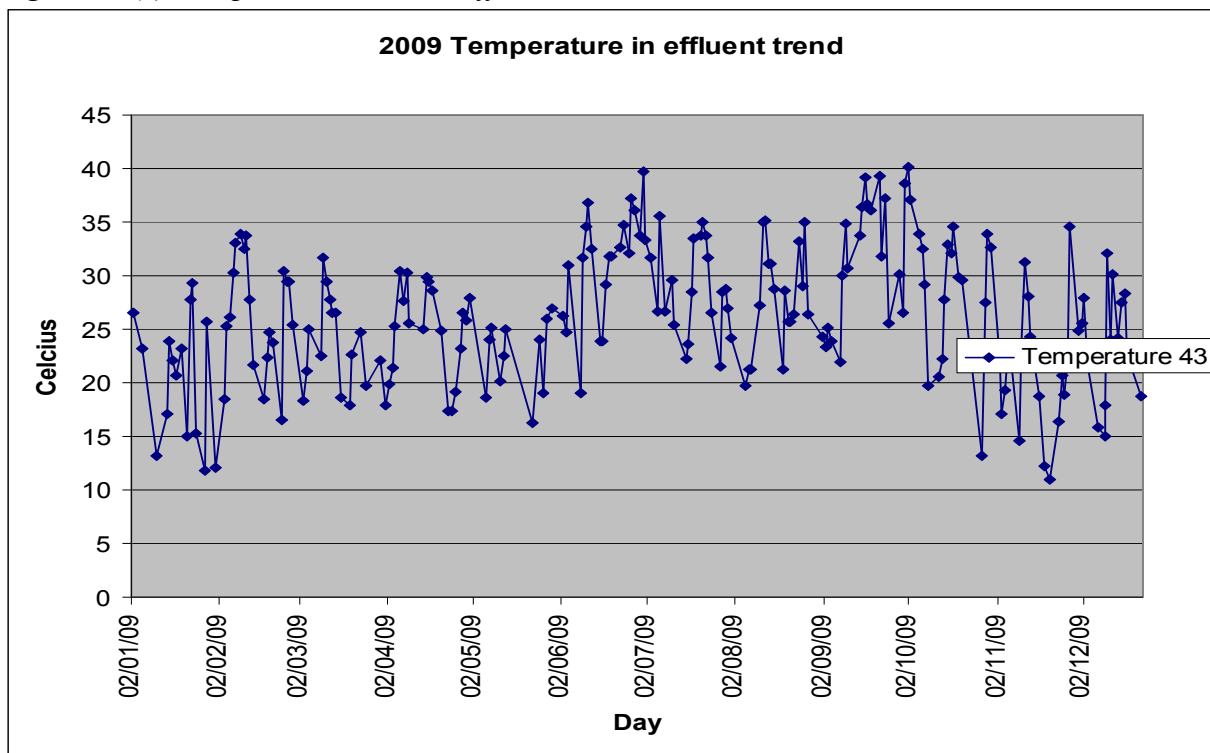


Figure 3.1(k):Temperature levels in effluent 2009



3.2 Groundwater monitoring

Enva currently have seven groundwater monitoring wells on site, three of which are deep water wells with the remaining four being shallow. Each borehole is sampled by baling the monitoring well or by pumping the well depending on the depth to groundwater. Groundwater quality reports and monitoring results for 2009 are included in Appendix 1.

3.3 Dust Monitoring

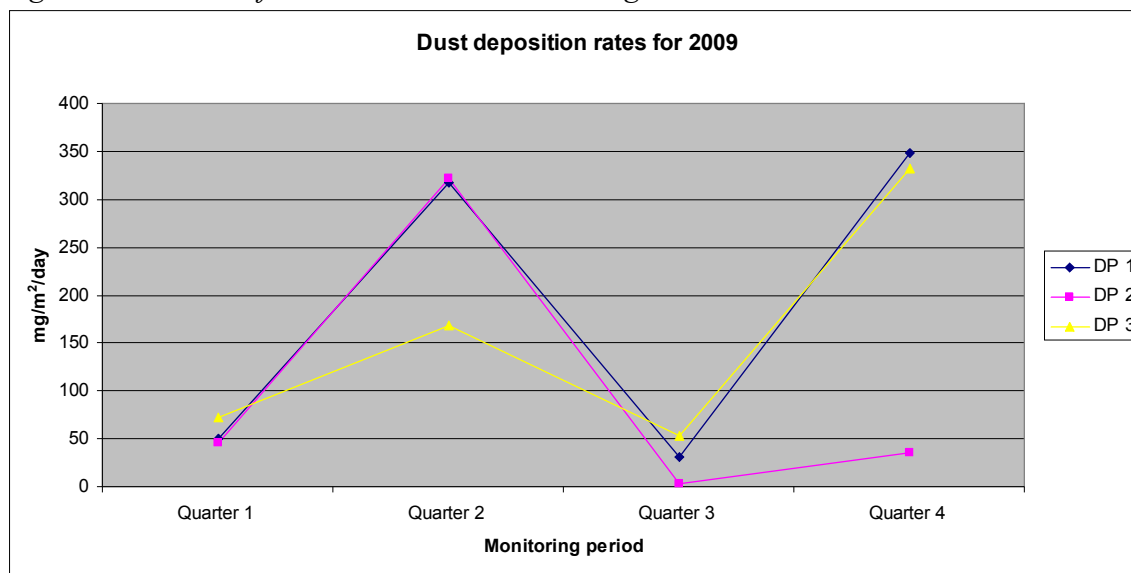
In accordance with Schedule D.1.2. of the WML 184-1 three monitoring locations were established on site in order to determine the ambient dust deposition from site activities.

Table 4: Dust Deposition monitoring

	Daily deposition rate mg/m ² /day	Daily deposition rate mg/m ² /day	Daily deposition rate mg/m ² /day	Daily deposition rate mg/m ² /day
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
DP 1	49.96	317.14	30.51	347.8
DP 2	45.75	321.87	2.65	35.9
DP 3	72.05	167.77	53.12	331.5

The graph below demonstrates the levels of dust recorded at the monitoring locations.

Figure 3.3: Levels of dust recorded on site during 2009.



All monitoring locations were below the limit for the reporting period.

3.4 Surface water monitoring

Surface water monitoring was carried out as per Schedule C3 and Table D.4.1 of the waste licence. Mineral oil analysis on surface water monitoring was not undertaken in January 2009 details of this incident are included in Section 5 of this report. Appendix 3 details the surface water monitoring results for 2009.

3.5 Boiler Monitoring

The boiler used by Enva is a dual fuel boiler which is largely fuelled by Natural gas. Boiler monitoring was carried out on the 22nd of September 2009 by Wright Environmental Services. The following emissions to atmosphere from the boiler were examined in the report as per Schedule D of the Waste Licence.

- Oxides of Sulphur
- Nitrogen Oxides
- Carbon Monoxide
- Combustion Efficiency

A copy of the boiler monitoring report is included in Appendix 4.

3.6 Noise monitoring

An environmental noise survey was conducted at the Enva Ireland site in Portlaoise on 4th of June 2009. It was found that Enva were in compliance with the Emission limits set out in schedule C of Waste Licence W0184-1. See Appendix 5 attached for the full noise monitoring report.

3.7 Monitoring locations

Appendix 6 attached details the monitoring locations on site. Please note this drawing is not to scale.

4.0 ENVIRONMENTAL MANAGEMENT

4.1 Resource and Energy Depletion

The main energy source required on site is for the main boiler. This boiler is a dual fuel boiler which can be run on either natural gas or gas oil. Figure 4.1.1(a) and 4.1.1(b) show natural gas and gas oil consumption in 2009.

4.1.1 Natural Gas and Gas oil usage.

Figure 4.1.1(a): Gas oil consumption of the boiler during 2009

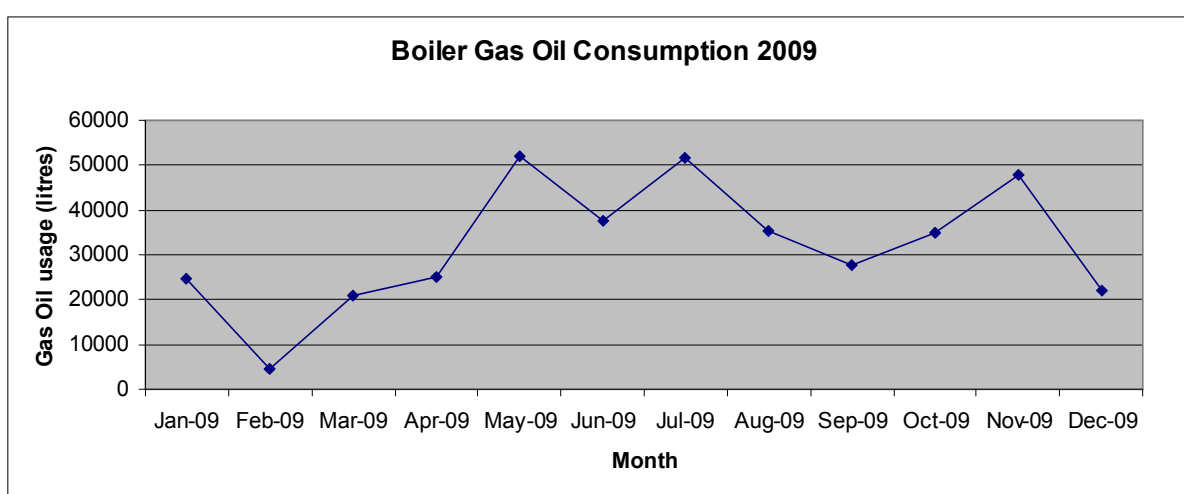
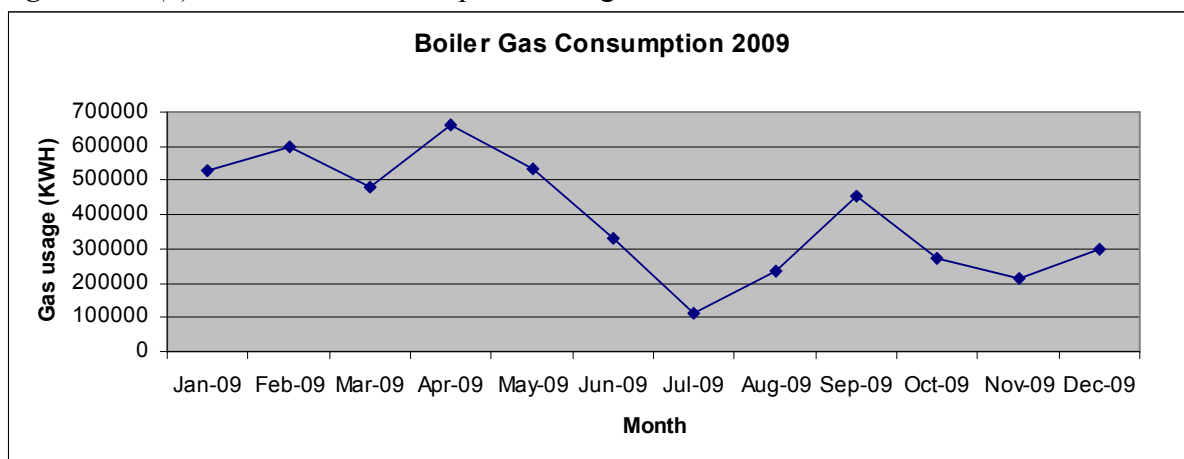


Figure 4.1.1(b): Boiler Gas Consumption during 2009

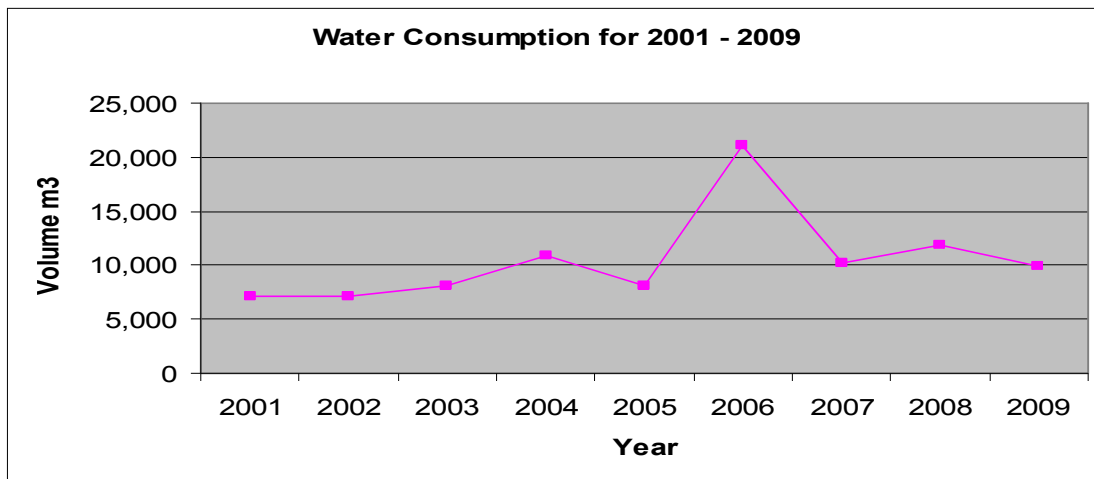


4.1.2 Water Usage

Water usage on site since 2001 has exhibited a general increasing trend which can mainly be attributed to both the increase of activities and personnel on site since 2001. A dramatic increase in water consumption was experienced in 2006 due to a leaking pipe underground.

Following the detection of this leak the water consumption reduced back to levels of normal consumption for the sites activities. This normal range of consumption has been maintained with a slight decrease in water usage during 2009.

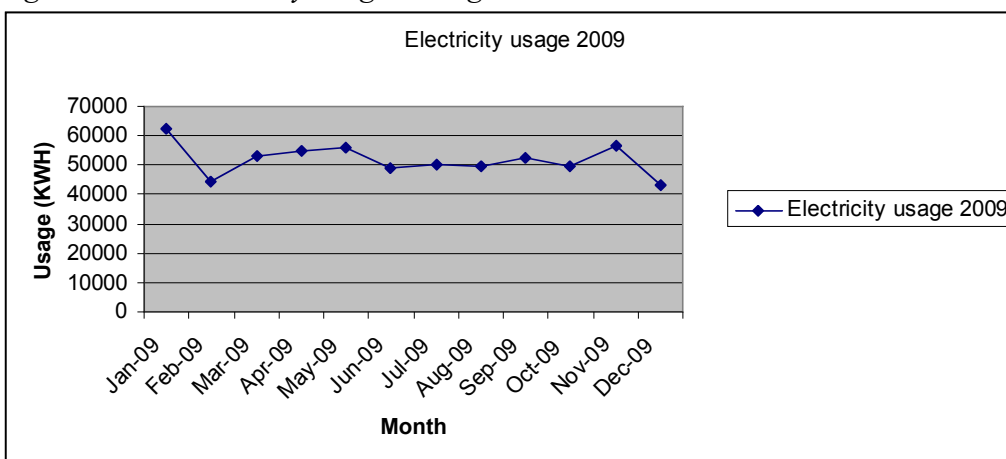
Figure 4.1.2: Water usage on site between 2001 and 2009



4.1.3 Electricity usage

The diagram below illustrates the electricity usage on site during 2009

Figure 4.1.3: Electricity usage during 2009



4.2 Environmental Management programme.

An Environmental Management System is in place and is accredited to the ISO 14001 standard. Appendix 16 attached contains the certificate of accreditation to this standard. While appendix 9 outlines the progress on current objectives and targets.

4.3 Development and Infrastructural works for 2010/11.

There are no plans currently to construct further infrastructure.

4.4 Process Critical equipment

The following table details the critical processing equipment

Table 5: critical processing equipment

Waste Process	Critical Equipment	Function	Back up measures
Waste Oil Processing	Boiler	Provides heat for the waste oil re-processing	Boiler is a dual fuel which can be alternatively run on kerosene or natural gas. In the event of one form of the fuel not being available. In the event of a breakdown the process can be run on a portable boiler which can be sourced from Concord boilers.
	Compressors	Provides air for valves on process equipment also used for dewatering oil.	Replacements can be hired in from Local hire company (Laois Hire)
	Flanges and valves on over-ground pipe lines	Direction of product	Repaired or replaced by on site fitter.
	Steam Traps	Part of oil heating system	Replacements on site
	Motor Screen	Filter waste oil	Motors can be purchased locally from local supplier (Portlaoise Rewinds) Spare screens are stored on site.
	Airlines	Provision of air to process equipment and storage tanks	Repaired by on site fitters or replaced as necessary
	Oil pumps including Blackmeir and Mono pumps Wording Simpson and submersible pumps.	Pumps are used in loading, unloading, at sump and moving oil during process	Spares on site
	Cat & Mouse gauge	Used to visually determine the volume of oil in tanks	Spare on site, or repaired as necessary by plant fitter.
	Scada	Electronic control of the waste oil processing	Process can be switched to manual control until Scada is fixed. Operational staff have been received training on the trouble shooting and working of the Scada system
Soil Processing	Power Screen logwash	Washing and screening of soil to segregate soil	Breakdowns can be repaired by on site fitter. Log wash and trommel

	Power Screen Trommel	and larger fractions into different streams.	can both be hired in the event of a breakdown.
Solid Oily waste re-packaging	Conveyor	Carriage of solid oily waste into drum.	Repaired by on site fitter.
Weighing of waste	Weighbridge	Weighing of waste	A second weighbridge has been installed. Mobile weighbridge can be sourced if required.
Metal Shredder	Shredder comprising of motors, conveyors and jaws.	Essential parts required for shredding of material can be repaired by plant fitter i.e. conveyor and motor	Plant would be repaired as soon as possible.
Surface water Run off	Interceptor	Discharge of on site surface water and separation of oil and water prior to discharge	Pumps and Motors can be replaced by plant fitter and can be quickly sourced in local supplier (Portlaoise Motor rewinds). There is a Duty and Standby pump system in place.
Forklift		Movement of waste around the facility	Forklifts can be hired in where necessary.
Loading shovel		Movement of soil on soil pads	Loading shovel can be hired from local plant Hire (Hinch plant hire).
Lime Treatment Plant	Filter press	Pressing of filter cake	Mobile filter press can be hired or brought from within the Enva group.
	Acid dosing pump	Neutralization of eluate	Sourced from supplier. There are other pumps on site which could be used.
	pH probe	Monitoring of pH	There are spare probes on site which could be used until the probe is replaced
	Flash mixer (pH adjustment after filter press)	Monitoring of pH	This is done by air which can be supplied by any of the compressors on site or hire of a mobile compressor. Effluent can be returned to process.
	Lime silo	dust filter	Spare dust filter kept on site
	Scada	Automatic control of process	Manual controls and bunding in place.
	Filter Press Cloth	Separating solids from effluent	Spear cloths are kept. They are not always new cloths but are cleaned before and inspected use
	Plates		Plate can be removed or spare plate sourced

4.5 Summary of Procedures

A summary of Standard Operating Procedures created since January 2009 is included in the table below.

Table 6: Summary of Standard Operating Procedures created during 2009

SOP title	Brief description
Sampling Procedure For Enva Sales Representatives	This procedure applies to the collection of samples including samples of waste or other chemical substances from customers by Enva employees. This includes situations where the Enva employee may have to draw out the sample themselves.
Out of specification results	This procedure applies to all test results generated in the laboratory which have predefined specifications. If a sample is analysed a number of times, the mean and all individual results must be within specification. This SOP complies with the General Requirements for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025:2005).
Principles of Good Laboratory Practice (G.L.P.)	The purpose of this procedure is to outline the basics of current good laboratory practices (cGLP) required for the operation of the laboratory at Enva Ireland Ltd. Portlaoise. In order to detect error and monitor the state of an analytical method, a good quality assurance program is necessary. The purpose of this procedure is to explain how Enva can guarantee quality within the area of Enva's laboratory in Portlaoise and maintain confidence through correctness and reliability of laboratory results
Maintenance and Calibration of Laboratory Equipment	To provide a procedure for the maintenance and calibration of equipment/instruments in use in the Laboratory.
Traffic Management plan for Enva Portlaoise	To provide a procedure for the manner in which traffic shall be managed on the Enva Portlaoise site. This procedure covers the control of traffic entering and exiting the site and the movement of vehicles and other plant around the site.
Use of barrel pump to empty mixed fuel containers	To provide a procedure for the use of the barrel pump to unload mixed fuel containers into the Underground storage tank.
Dosing of treated waste water	To provide a procedure for safe dosing of treated waste water for release.
Storage of packaged wastes	To provide a procedure for the storage of packaged wastes on the Enva, Portlaoise site. This procedure covers the storage and onward movement to a recovery or disposal destination. (Packaged waste can be classed as a drum, barrel, bag, wheelie bin or similar container suitable to carry the material or as approved under ADR/IMDG.)

4.6 Review of Nuisance Controls

Condition 7 "Nuisances", of the waste management license 184-1 requires all nuisances to be controlled. SOPN 74 the HSE Site Inspections Standard Operating Procedure is used to aid in compliance with this condition. A weekly checklist to inspect the site for the presence of noise, odour, vermin, dust or mud is integral to this procedure.

A list of likely nuisances to arise from the activities undertaken on the Enva Ireland site and their controls are detailed below.

Vermin

Vermin control is in place, “Rentokil” inspect and bate the site approximately four times per year.

Odours

No significant odours have been detected on the site from the weekly site inspections, however odour complaints have been received from a neighbouring facility for further information please see section 5.

Dust

Dust monitoring is undertaken on a quarterly basis by Enva laboratory personnel in accordance with VDI 2119 Part 2, “*Measurement of particulate Precipitations, Determination of Dust Precipitation with Collecting Pots Made of Glass (Bergerhoff Method) or Plastic*” Enva use a roadsweeper to remove any soil or particles from the site which when dried could generate a dust nuisance.

Noise

Noise monitoring is carried out on an annual basis as per Condition D3. of the waste licence W0 184-1. Please see Appendix 5 on Noise Monitoring.

4.7 Bund Integrity testing.

Bund integrity inspection report was carried out on the 4th of July 2007 by Kavanagh Ryan and associates and previously submitted as part of the 2008 AER.

4.8 Calibration of temperature probes

See Appendix 12 for calibration certificates for relevant temperature probes

4.9 Inspection of underground pipelines

See Appendix 11 for the CCTV report detailing the findings of an inspection of underground pipelines

5.0 NON-CONFORMANCES

5.5.1 Non Conformances reported to the EPA during 2009

Table 7: Summary of non-conformances reported to the EPA 2009

Environmental Incidents	2009
Effluent	1
Groundwater	0
Odour	2
Dust	0
Surface Water	1
Autosampler faults	2
Other	2

The graph below indicates the incident trends between 2006 and 2009.

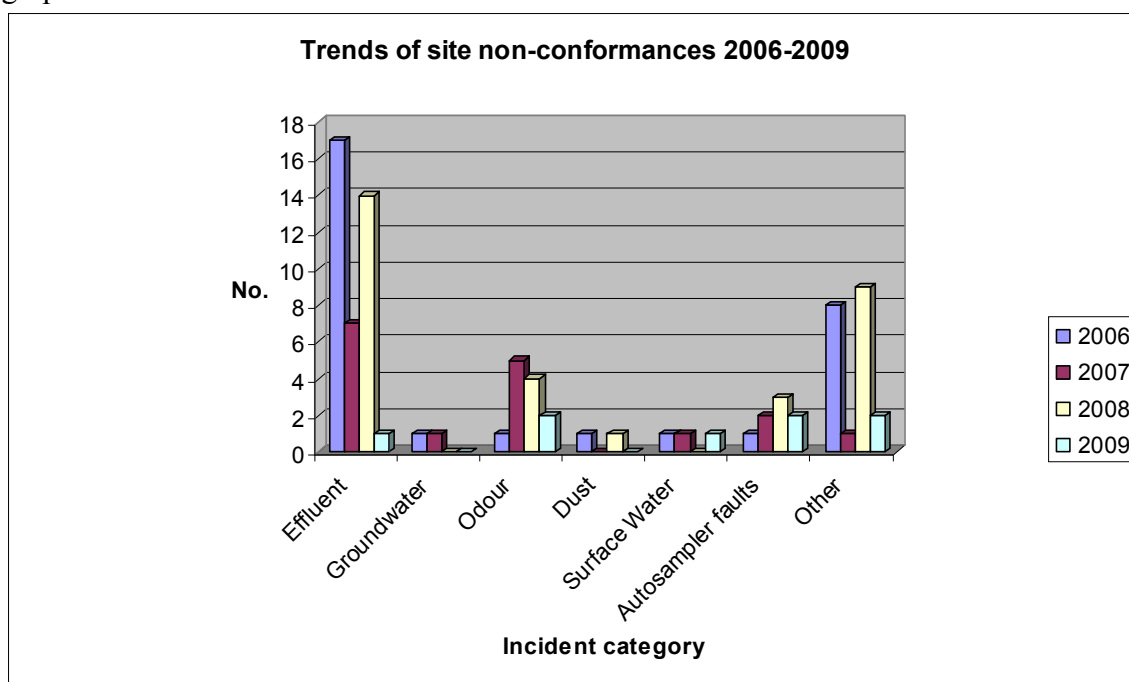


Table 8 below gives a brief description of each of the non conformances reported to the EPA in 2009

Category of incident	Date of incident/ complaint	Summary of incident	Remedial action taken
Autosampler	15.12.09	It was found that the final effluent release composite sampler had not taken a composite sample of the effluent released on the night of the 15 th of December. Upon investigation no apparent faults were found with the actual sampler. It is thought this error occurred due to a power outage on the evening of the 15 th of December in the plant. This power outage was as a result of a planned test of the sites back up generator.	As a result of implementing additional checks on the power supply to the plant, it was found that the auto-sampler was affected by this power outage. In order to prevent this from re-occurring the auto-sampler has been placed on a re-start checklist along with those other pieces of equipment which will not automatically re-start.
	16.06.09	A composite sample was not taken for effluent released 16.06.09 due to a malfunction in the autosampler at FS1. Investigations were conducted to determine the cause of the malfunction. The communication between the SCADA system and the autosampler was tested and found to be operational. Upon further investigation it was found that the pump in the autosampler was not uplifting the entire sample. The supplier of the autosampler was contacted to determine if this is the root cause of the malfunction.	The supplier of the auto-sampler performed the identified necessary repairs.
Effluent	28.05.09	Analysis of the weekly effluent sample on the 28/05/09 for the period 21 st of May to the 27 th of May exceeded the licence limits for sulphates. This exceedance was due to the nature of the processing of waste oil, oily waters may become contaminated with sulphate fractions due to the inherent nature of the waste oils collected. Enva could not attribute this elevated sulphate level to a particular source.	No significant source was identified and there were no further re-occurrences.
Surface water	January 2009	Upon review of records for surface water discharge it was found that no mineral oil analysis was performed as part of the monthly surface water monitoring for January 2009. Investigations found that this was due to administration error due to the lab analyst failing to check the parameters	A check sheet for samples being sent for external analysis detailing when the samples should be sent and what they should be tested for was established and a cross check of

		<p>requested an external laboratory to analyse.</p> <p>An inspection of the interceptor is carried out by laboratory staff on a weekly basis. A review of this inspection sheet for January found that there was no significant oil present in the surface water discharge.</p>	parameters for analysis carried out by the HSE Manager.
Other	27.05.09	Waste metal hosing collected from Enva Ireland Portlaoise on the 27/05/09 by Midland Scrap Metal (MSM) Ltd. was taken to the MSM site located at 41-42 Cookstown Industrial Estate, Tallaght Dublin 24, instead of the Enva approved MSM site at Bellview bulk terminal, Gurteens, Slieverue, Co Kilkenny. This incident occurred as a result of a decision taken by MSM management to handle these waste hoses on site in Dublin. This change in destination was not notified to Enva at the time.	This site has since been approved as a location for the acceptance of waste from Enva.
	22.01.09	<p>When attempting to access data from Enva weather station, a problem was encountered with downloading this information.</p> <p>Investigations were conducted with the supplier of the weather station to rectify the problem which was linked to a software error.</p>	In the short term, daily records were down loaded from Met Eireann and the daily wind direction logged on site via the wind sock. Rain fall was also logged on site via a collection receptacle. The weather station was returned to the supplier and the necessary repairs were carried out and the unit re-installed.
Odour	12.08.09	<p>An odour complaint was reported to Enva by Irish rail, Clonminam, Portlaoise, Co. Laois on the 10th of August 2009 at approximately 10.10 pm. An investigation into the source of the odour was carried out by the Enva HSE Manager, a site walk around was conducted and found that there was no excessive odours present. The wind on the morning was a slack to moderate west to north westerly. There were no unusual waste streams being processed. Normal processing activities were being carried out on site included processing in tanks 24 and 32. In order to alleviate any possible odours generated, these tanks were not processed until later in the day. The odour suppression unit was inspected on Friday the 7th of August and found to be working, however a couple of nozzles of the unit needed replacing due to corrosion and exposure to the elements.</p>	Replacement of nozzles were carried out on the odour suppression unit by operations staff. Further preventative maintenance will be introduced to prevent corrosion of the nozzles preventing the unit from working.

	07.08.09	<p>An odour complaint was reported to Enva by Jim Shaw of Irish rail, Clonminam, Portlaoise, Co. Laois on the 7th of August 2009 at approximately 12.00 pm. The complainant stated that it was reported to him that there was an odour on that day and over the last couple of days. An investigation was carried out by the Enva HSE Manager and two other operations staff to determine if there were any malodours present on site from processing. Wind direction on the day of the report was westerly and therefore in the direction of the complainant's site, however the wind direction over the last two days was recorded as being directly southerly and could not have lead to any odour generation on the complainant's site due to the geographical position of the two activities. Activities being carried out on site were as per normal site activities. There were no unusual waste streams being processed. The odour suppression unit was inspected and found to be working, upon inspection it was found that a couple of nozzles of the unit needed replacing due to corrosion and exposure to the elements.</p>	<p>Replacement of nozzles were carried out on the odour suppression unit by operations staff. Further preventative maintenance will be introduced to prevent corrosion of the nozzles preventing the unit from working.</p>
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5.5.2 Non Conformances identified during EPA site visits in 2009

No non conformances were identified in an EPA site visit on the 27th of November 2009. Nine observations were made by the Agency and a schedule of corrective actions to address these observations was submitted to the agency on the 04.03.10.

6.0 PUBLIC INFORMATION

All queries with regard to public information are dealt with as per SOP-N10 HSE Communications Procedure. See Appendix 8.

7.0 CLOSURE, RESTORATION, AFTERCARE MANAGEMENT PLAN

The Closure, Restoration, Aftercare Management Plan has not been altered significantly since its submission in 2008. See Appendix 13 for a copy of the Closure, Restoration, Aftercare Management Plan

8.0 ENVIRONMENTAL LIABILITY RISK ASSESSMENT

The Environmental Liability Risk Assessment has not been altered significantly since its submission in 2008. See Appendix 14 for a copy of the Environmental Liability Risk Assessment

9.0 OEE METHODOLOGY FOR DETERMINING ENFORCEMENT CATEGORY OF LICENCES

The enforcement category summary page of the OEE Methodology is included in Appendix 10.

10.0 WASTE RECOVERY REPORT

See Appendix 7 for waste recovery report for 2009

11.0 PRTR returns

Appendix 15 includes a copy of the PRTR returns.

Appendix 1

Groundwater Quality

Monthly analysis of field parameters for on site boreholes for January to December is shown in the tables below. Please note that the monitoring results for March, May, August and December are excluded from the tables below as these are included in the groundwater monitoring reports carried out by RPS.

Table 1: January Groundwater quality

Field Measured Parameters Water Analytical Results									
Date: 30.01.2009			Monitoring Wells						
Parameter	Drinking water standards	Units	MW01	MW02	MW03	BH101	BH102	BH103	BH104B
Depth of water in boreholes	-	m	2.90	4.10	4.00	4.00	2.76	1.60	0.70
Conductivity	1500	uS/cm	646	611	779	556	1302	938	851
pH	6.5<pH<9.5	n/a	6.94	7.14	6.63	6.85	6.52	6.98	6.93
Temp.	25	deg C	11.0	10.6	11.1	10.4	10.3	9.6	8.0
DO	-	mg/l	28.6	36.2	51.6	37.8	41.7	38.7	27.3

LEGEND

Indicates result in excess of statutory Irish standards for drinking water.

Table 2: February Groundwater quality

Field Measured Parameters Water Analytical Results									
Date: 26+27.02.2009			Monitoring Wells						
Parameter	Drinking water standards	Units	MW01	MW02	MW03	BH101	BH102	BH103	BH104B
Depth of water in boreholes	-	m	3.10	4.00	4.25	4.48	3.54	2.10	1.70
Conductivity	1500	uS/cm	521	490	651	615	1145	738	679
pH	6.5<pH<9.5	n/a	7.9	7.89	7.65	7.13	7.09	6.8	6.93
Temp.	25	deg C	10.4	10.6	11.4	10.5	10.0	9.1	8.1
DO	-	mg/l	43.2	42.2	33.0	43.5	37.8	41.9	30.2

LEGEND

xx Indicates result in excess of statutory Irish standards for drinking water

Table 3: April Groundwater quality

Field Measured Parameters Water Analytical Results**Date: 29th and 30th April 2009****Monitoring Wells**

Parameter	Drinking water standards	Units	MW01	MW02	MW03	BH101	BH102	BH103	BH104B
Depth of water in boreholes	-	m	2.96	4.13	5.70	4.30	3.00	1.82	0.50
Conductivity	1500	uS/cm	646	613	840	716	1144	863	649
pH	6.5<pH<9.5	n/a	6.65	6.54	6.50	6.66	6.75	6.60	6.55
Temp.	25	deg C	11.0	10.9	11.5	10.6	10.0	10.2	9.8
DO	-	mg/l	3.48	3.39	3.20	5.08	1.56	2.06	1.31

LEGEND

xx Indicates result in excess of statutory Irish standards for drinking water.

Table 4: June Groundwater quality

Field Measured Parameters Water Analytical Results**Date: 24th and 25th June 2009****Monitoring Wells**

Parameter	Drinking water standards	Units	MW01	MW02	MW03	BH101	BH102	BH103	BH104B
Depth of water in boreholes	-	m	2.70	4.18	4.10	4.3	3.38	3.93	0.76
Conductivity	1500	uS/cm	503	594	837	819	1176	851	480
pH	6.5<pH<9.5	n/a	7.19	7.4	7.51	7.54	6.93	6.79	7.53
Temp.	25	deg C	12.5	12.5	12.7	13.8	12.2	13.5	13.1
DO	-	mg/l	4.19	3.39	4.61	4.80	3.33	3.48	0.99

LEGEND

xx Indicates result in excess of statutory Irish standards for drinking water.

Table 5: July Groundwater quality

Field Measured Parameters Water Analytical Results**Date: 21st and 22nd July 2009****Monitoring Wells**

Parameter	Drinking water standards	Units	MW01	MW02	MW03	BH101	BH102	BH103	BH104B
Depth of water in boreholes	-	m	2.90	3.96	3.94	4.27	2.90	1.72	0.50
Conductivity	Limit: 1500	uS/cm	592	598	826	603	893	875	482
pH	6.5<pH<9.5	n/a	6.67	7.09	7.31	6.97	6.54	6.97	7.03
Temp.	Limit: 25	deg C	12.6	11.5	12.6	12.5	12.7	13.9	14.2
DO	-	mg/l	3.08	1.46	4.54	3.78	1.0	11.14	2.27

LEGEND

xx Indicates result in excess of statutory Irish standards for drinking water.

Table 6: September Groundwater quality

Field Measured Parameters Water Analytical Results**Date: 30th September 2009****Monitoring Wells**

Parameter	Drinking water standards	Units	MW01	MW02	MW03	BH101	BH102	BH103	BH104B
Depth of water in boreholes	-	m	3.10	4.27	4.30	4.46	3.64	2.61	1.7
Conductivity	Limit: 1500	uS/cm	369	600	878	793	1223	863	141
pH	6.5<pH<9.5	n/a	7.00	7.83	7.49	7.74	6.58	6.98	7.51
Temp.	Limit: 25	deg C	11.7	11.4	12.1	13.4	13.0	13.9	13.6
DO	-	mg/l	5.63	4.52	5.65	4.49	4.37	4.02	19.3

LEGEND

xx

Indicates result in excess of statutory Irish standards for drinking water.

Table 7: October Groundwater quality

Field Measured Parameters Water Analytical Results**Dates: 28th to 30th October 2009****Monitoring Wells**

Parameter	Drinking water standards	Units	MW01	MW02	MW03	BH101	BH102	BH103	BH104B
Depth of water in boreholes	-	m	2.40	3.87	3.98	4.3	3.15	2.30	0.53
Conductivity	1500	uS/cm	635	599	564	778	1064	863	506
pH	6.5<pH<9.5	n/a	7.14	7.25	6.94	7.29	6.56	7.26	7.15
Temp.	25	deg C	12.2	11.2	13.5	13.1	12.8	13.6	12.7
DO	-	mg/l	3.07	1.7	3.11	1.21	1.33	3.1	1.44

LEGEND

xx

Indicates result in excess of statutory Irish standards for drinking water.

Table 8: November Groundwater quality

Table Field Measured Parameters Water Analytical Results**Date: 10th and 11th November 2009****Monitoring Wells**

Parameter	Drinking water standards	Units	MW01	MW02	MW03	BH101	BH102	BH103	BH104B
Depth of water in boreholes	-	m	2.59	3.57	3.72	4.00	3.96	2.21	0.50
Conductivity	1500	uS/cm	512	550	888	667	213.4	916	408
pH	6.5<pH<9.5	n/a	7.8	7.9	7.45	7.72	6.65	7.34	7.67
Temp.	25	deg C	11.5	10.9	11.3	12.6	12.7	12.5	11.1
DO	-	mg/l	4.76	3.57	4.72	5.04	3.25	3.18	3.65

LEGEND

xx

Indicates result in excess of statutory Irish standards for drinking water.



**Groundwater Quality Monitoring
Enva Ireland Ltd
Quarter 1 2009**

DOCUMENT CONTROL SHEET

Client	Enva Ireland Ltd					
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Document Title	Quarterly Groundwater Analysis					
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1 INTRODUCTION

RPS has been commissioned by Enva Ireland Ltd to carry out groundwater quality monitoring for environmental compliance, at their facility in the Clonminam Industrial Estate, Portlaoise, Co Laois. Groundwater monitoring has been carried out in strict accordance with criteria set out in Schedule 4(ii) of the site's Waste Licence Register No. W0184-01.

Enva Ireland has been operating under Waste Licence Register No. W0184-01 since December 2005, and is required to submit a report to the Environmental Protection Agency (EPA) on a quarterly basis, outlining the existing groundwater quality underlying the site.

Suitably qualified environmental consultants from RPS, collected groundwater samples from a series of monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03) within the site boundaries. The samples underwent laboratory analysis for the suite of parameters specified in Schedule 4(ii) of Waste Licence W0184-01. This report outlines the results of the monitoring round conducted on the 5th March 2009, which corresponds to the first quarter of 2009.

2 METHODOLOGY

Groundwater samples were collected from seven on-site groundwater-monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03), using dedicated Waterra tubing, in accordance with RPS's standard sampling protocol. A non-return foot valve was fixed to the bottom of the tubing and inserted into the well, reaching the base of the bore. Separate tubing and foot valves were used at each monitoring well to eliminate the possibility of cross contamination.

Groundwater in the well casing is not considered representative of the groundwater quality at a given location. For this reason, four well volumes were purged from each well prior to collecting the groundwater sample. By the time purging was complete; all field test water parameters (namely pH, temperature, electrical conductivity and dissolved oxygen) were within 10% variance in three consecutive measurements. This ensured that the groundwater sample extracted from the monitoring borehole was representative of the water held in the subsurface strata and not water held stagnant in the borehole casing. The purged volumes were calculated on-site from the measured static water levels and total well depths, using an electronic dip meter.

In order to ensure optimal evaluation, the pH, conductivity and temperature of the extracted water were continually monitored using a field meter, which was calibrated on the day of use. Groundwater samples were collected in laboratory supplied containers and stored in chilled cool boxes following sampling and during transit to the laboratory. A rigorous chain of custody procedure was used during the sample round.

All groundwater samples were analysed at a UKAS accredited laboratory, *STL*, for the suite of analyses listed in Table 1. Table 1 also indicates the analytical techniques used by the laboratory.

Table 1: Analytical Methodologies – STL Laboratories

Parameter	Analytical Methodology
BTEX	GCMS
Metals	Nitric digest/ICP
Polycyclic Aromatic Hydrocarbons (PAHs)	GC
Phenol	GCMS
Semi-Volatile Organic Compounds	GCMS
Volatile Organic Compounds	GCMS VOC
Extractable Petroloelum Hydrocarbons (EPH)	GC-FID
Volatile Petroloelum Hydrocarbons (VPH)	GC-FID & GCMS
Total Petroloelum Hydrocarbons (TPH)	Headspace GC-FID/GC-FID.

3 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

The Enva Ireland site is located 1km to the west of the River Triogue, sloping to the East and Southeast. The site is low-lying and well drained (Figure 1). According to the Geological Survey of Ireland (GSI) the underlying bedrock consists of Argillaceous Bioclastic Limestone (*Geological Map Sheet No.15*).

The limestone bedrock is classified by the GSI as a locally important aquifer. Perched water is present within the overlying sandy boulder clay. The groundwater in the bedrock aquifer is used regionally as a potable water supply. However, no abstraction wells have been identified within a 1 km radius of the site.

The groundwater vulnerability in the region is classified as 'extreme' due to the high permeability of the subsoil and the shallow groundwater depths (*GSI classification: Groundwater Monitoring Round Report, 2002*).

Figure 1: Site Location

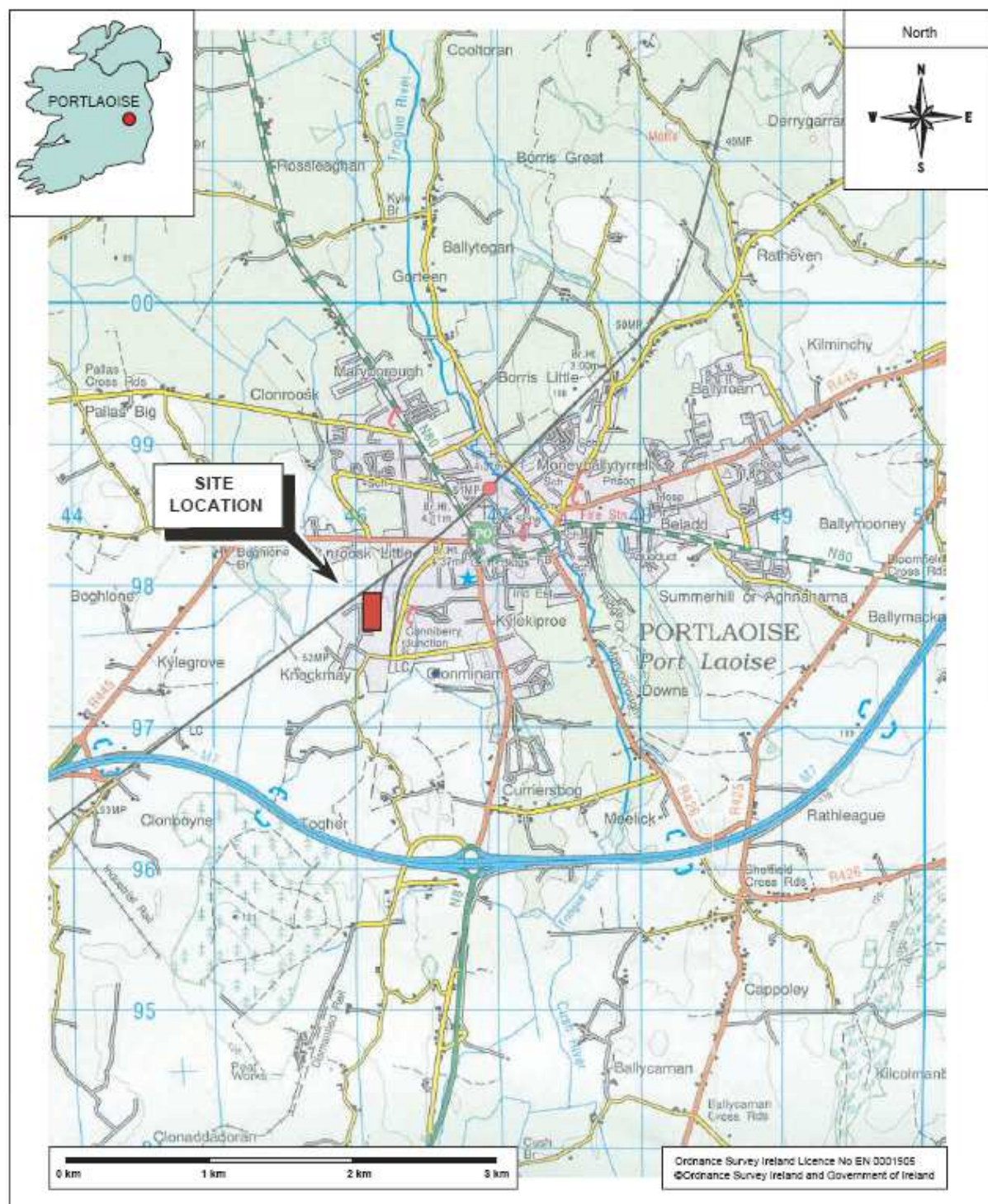
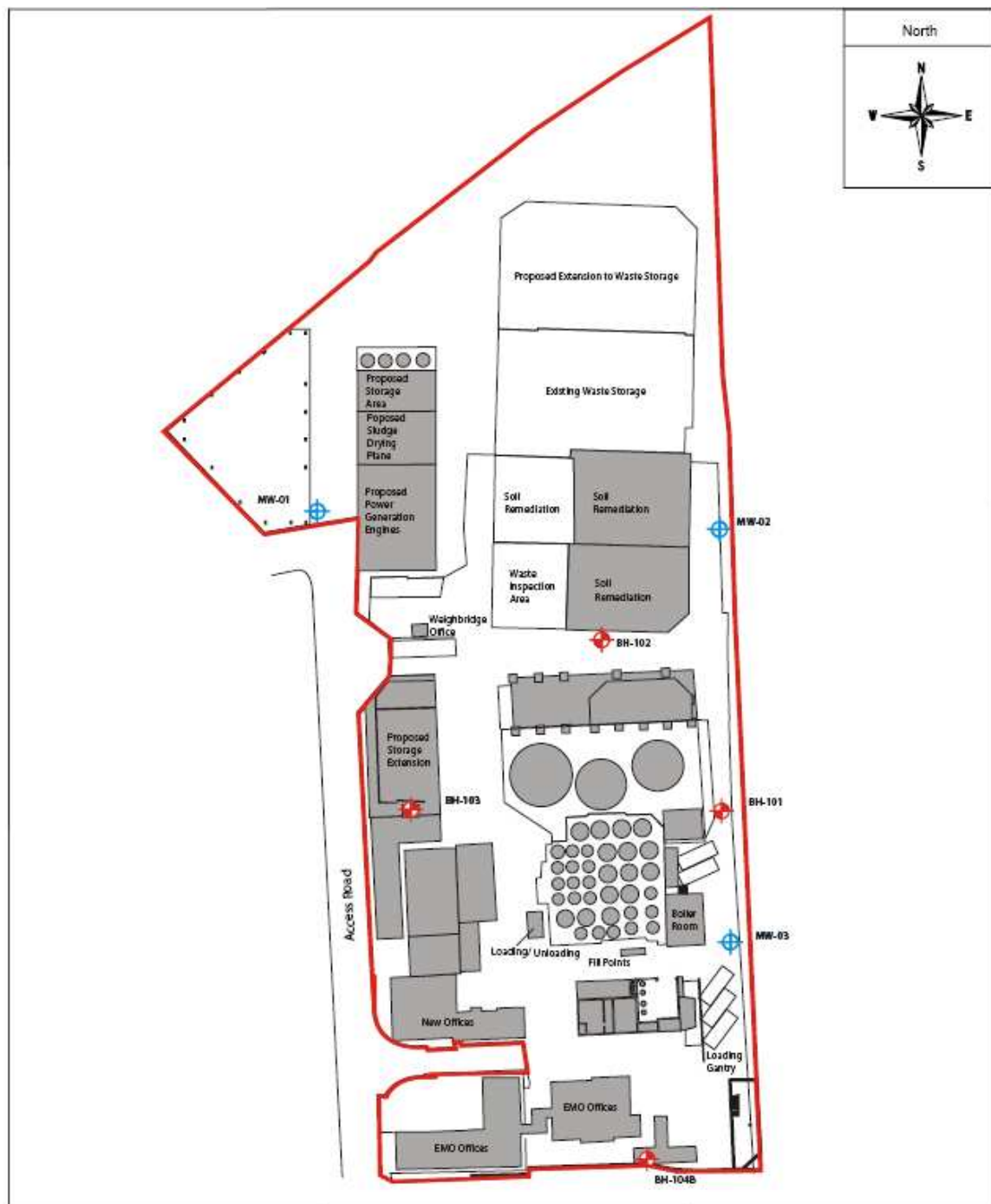




Figure 2: Site Layout Plan

Source: URS Environmental Consultants

Shallow Monitoring Well locations 
 Deep Monitoring Well locations 

4 RESULTS

The results of all field measurements and laboratory analysis are presented in this section.

Table 2: Results of Field Parameters Measured at Each Groundwater Monitoring Well

Field Parameters								
Monitoring Well	Depth (m)	Static water Level (m)	Volume Extracted (l)	Dissolved O2 (ppm)	Conductivity (µs/cm)	pH (pH units)	Temp (°C)	Observations
BH101	6.80	3.47	15	n/a	648	8.30	n/a	Slightly cloudy, slight hydrocarbon/petrochemical odour
BH102	5.05	2.05	10	n/a	1240	8.10	n/a	Slightly Cloudy, Odourless
BH103	4.51	1.71	15	n/a	802	8.40	n/a	Black Cloudy, Surface Water leaking through manhole into Well Head
BH104B	4.80	3.01	15	n/a	724	8.20	n/a	Dark/Cloudy, Black Colour, oily odour.
MW01	22.89	3.72	120	n/a	562	8.40	n/a	Clear, Odourless
MW02	30.01	4.33	100	n/a	523	8.40	n/a	Clear, Odourless
MW03	15.01	0.00	50	n/a	610	8.30	n/a	Dark/Cloudy, Black Colour, oily odour.
Interim Guideline Value	-	-	-	-	1000	>6.5 & <9.5	25°C	

Table 3: Results of BTEX in Groundwater Samples

Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values (units as indicated)
BTEX									
Benzene	µg/l	0.11	<0.10	0.78	<0.10	<0.10	<0.10	<0.10	1
Ethyl Benzene	µg/l	<0.10	<0.10	0.6	<0.10	<0.10	<0.10	0.27	10
m&p Xylene	µg/l	0.12	<0.10	0.75	<0.10	<0.10	<0.10	0.21	-
o-Xylene	µg/l	0.11	<0.10	1.28	<0.10	<0.10	<0.10	0.32	-
Toluene	µg/l	<0.10	<0.10	0.38	0.19	<0.10	<0.10	<0.10	10
Total Xylenes	µg/l	0.23	<0.20	2.03	<0.20	<0.20	<0.20	0.53	10

Table 4: Results of Metals in Groundwater Samples

Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values (units as indicated)
Metals									
Cadmium	mg/l	<0.0003	0.0014	0.0034	0.0014	0.002	0.0012	0.0014	0.005
Chromium	mg/l	0.002	<0.001	0.006	0.005	<0.001	<0.001	<0.001	0.03
Copper	mg/l	0.01	<0.001	0.04	0.02	<0.001	<0.001	0.007	0.03
Iron	mg/l	1.77	12.87	6.49	4.71	1.38	0.22	3.67	0.2
Lead	mg/l	0.05	0.01	0.34	0.022	0.01	<0.002	0.011	0.01
Magnesium	mg/l	7.74	12	18	8.29	41	37	15	50
Mercury	mg/l	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.001
Potassium	mg/l	1.68	11	26	7.85	1.62	1.24	1.46	5
Zinc	mg/l	0.056	<0.002	0.19	0.02	<0.002	<0.002	<0.002	0.1
Arsenic	mg/l	0.002	0.008	0.01	0.004	0.001	<0.001	0.004	0.01

Table 5: Results of PAHs in Groundwater Samples

PAHs									
Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values
Acenaphthene	ug/l	<0.01	<0.01	0.69	<0.01	<0.01	<0.01	<0.01	-
Acenaphthylene	ug/l	<0.01	<0.01	0.16	<0.01	<0.01	<0.01	<0.01	-
Anthracene	ug/l	<0.01	<0.01	0.4	<0.01	<0.01	<0.01	0.07	10000
Benzo (a) anthracene	ug/l	<0.01	<0.01	0.66	<0.01	<0.01	<0.01	<0.01	-
Benzo (a) pyrene	ug/l	<0.01	<0.01	0.34	<0.01	<0.01	<0.01	<0.01	0.01
Benzo (b) fluoranthene	ug/l	<0.01	<0.01	0.8	<0.01	<0.01	<0.01	<0.01	
Benzo (g,h,i) perylene	ug/l	<0.01*	<0.01*	0.42*	<0.01*	<0.01*	<0.01*	<0.01*	0.05
Benzo (k) fluoranthene	ug/l	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	
Chrysene	ug/l	<0.01	<0.01	0.8	<0.01	<0.01	<0.01	0.03	-
Dibenz (a,h) anthracene	ug/l	<0.01	<0.01	0.1	<0.01	<0.01	<0.01	<0.01	-
Fluoranthene	ug/l	<0.01	<0.01	0.17	<0.01	<0.01	<0.01	<0.01	-
Fluorene	ug/l	<0.01	<0.01	0.77	<0.01	<0.01	<0.01	0.03	1
Indeno (1,2,3) cd pyrene	ug/l	<0.01*	<0.01*	0.32*	<0.03*	0.02*	0.01*	<0.01*	0.05
Naphthalene	ug/l	<0.01	<0.01	0.13	<0.01	<0.01	<0.01	0.04	1
Phenanthrene	ug/l	<0.01	<0.01	1.12	<0.01	<0.01	<0.01	<0.01	-
Pyrene	ug/l	<0.01	<0.01	1.47	<0.01	<0.01	<0.01	0.13	-
PAH, Total	ug/l	<0.01*	<0.01*	8.40*	<0.03*	0.02*	0.01*	0.01*	-

* = Results given as an indication due to a quality failure. PAH subbed from 1L pet bottle.

Table 6: Results of Phenol Concentrations in Groundwater Samples

Phenols									
Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values
Total Phenol (monohydric)	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5

Table 7: Results of SVOC's in Groundwater Samples

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
1,2,4-Trichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.4
1,2-Dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	10
1,3-Dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
1,4-Dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2,4,5-Trichlorophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2,4,6-Trichlorophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	200
2,4-Dichlorophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2,4-Dimethylphenol	ug/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	-
2,4-Dinitrotoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2,6-Dinitrotoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2-Chloronaphthalene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2-chlorophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	200
2-Methylnaphthalene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.6	-
2-Methylphenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2-Nitrophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
3&4-Methylphenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
4-Bromophenyl phenyl ether	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
4-Chloro-3-MethylPhenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
4-Chlorophenyl Penyl Ether	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
4-Nitrophenol	ug/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	-
Acenaphthene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Acenaphthylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Anthracene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	10000
Benzo(a)anthracene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Benzo(a)pyrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.01
Benzo(b)fluoranthene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.5
Benzo(g,h,i)perylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.05
Benzo(k)fluoranthene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.05
Benzyl Butyl Phthalate	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
bis(2-chloroethoxy)methane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Bis(2-chloroethyl)ether	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
bis(2-chloroisopropyl)ether	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
bis(2-ethylhexyl)phthalate	ug/l	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<20.0	-
Chrysene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Dibenzo(a,h)anthracene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Dibenzofuran	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Diethylphthalate	ug/l	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<6.0	-
Dimethylphthalate	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
di-n-Butylphthalate	ug/l	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<20.0	2

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
Di-n-octylphthalate	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Diphenylamine/diphenylnitrasam	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
Fluoranthene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	1
Fluorene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Hexachlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.03
Hexachlorobutadiene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.1
Hexachloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Indeno(1,2,3-c,d)pyrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.05
Isophorone	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Naphthalene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	1
Nitrobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	10
N-nitrosodi-n-propylamine	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Pentachlorophenol	ug/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	2
Phenanthrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Phenol	ug/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	0.5
Pyrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-

Table 8: Results of VOC's in Groundwater Samples

VOC's									
Parameter	Method Detection Limits (ug/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (ug/l)
1,1,1,2-tetrachloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1,1-Trichloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	500
1,1,2,2-tetrachloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1,2-trichloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1-Dichloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.1	-
1,1-Dichloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1-Dichloropropene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,3-trichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,3-trichloropropane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,4-trichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.4
1,2,4-trimethylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.2	-
1,2-dibromo-3-chloropropane	ug/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-
1,2-dibromoethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2-dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
1,2-Dichloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3
1,2-Dichloropropane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3,5-trimethylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3-dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3-dichloropropane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,4-dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

VOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
2,2-Dichloropropane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-chlorotoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-chlorotoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Benzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Bromobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromochloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromodichloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromoform	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromomethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Carbon Tetrachloride	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Chlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Chloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Chloroform	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12
Chloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Cis-1,2-dichloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Cis-1,3-dichloropropene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibromochloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibromomethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dichlorodifluoromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dichloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Ethyl Benzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Hexachlorobutadiene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.1

VOC's									
Parameter	Method Detection Limits (ug/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (ug/l)
Isopropylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
m,p-xylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
MTBE	ug/l	<1.0	1.2	13.1	<1.0	<1.0	<1.0	<1.0	-
Naphthalene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	1
n-butylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
n-propylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
o-xylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	10
p-isopropyltoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
sec-butylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Styrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
tert-butylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Tetrachloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	40
Toluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Trans-1,2-dichloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Trans-1,3-dichloropropene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Trichloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	70
Trichlorofluoromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Vinyl Chloride	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

Table 9: Results of EPH/TPH/VPH in Groundwater Samples

EPH/TPH/VPH										
Fraction	Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Pure Phase Solubility
Aliphatic	EPH>C10-C12	ug/l	<10	<10	<10	<u>1200</u>	<10	<10	<100	(34)
	EPH>C10-C44	ug/l	1632	382	2737	11100	101	25	1657	-
	EPH>C12-C16	ug/l	<10	<10	<u>30</u>	<u>4200</u>	<10	<10	<u>131</u>	(0.76)
	EPH>C16-C35	ug/l	<u>1500</u>	<u>354</u>	<u>2600</u>	<u>5700</u>	<u>80</u>	<u>25</u>	<u>1300</u>	(0.0025)
	EPH>C35-C44	ug/l	132	28	107	<10	21	<10	226	-
	TPH>C5-C44	ug/l	1632	382	2737	11100	101	25	1657	-
	VPH>C5-C10	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C5-C6	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C6-C8	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C8-10	ug/l	<10	<10	<10	<10	<10	<10	<10	-
Aromatic	EPH>C10-C12	ug/l	<10	<10	<10	300	<10	<10	<100	(25,000)
	EPH>C10-C44	ug/l	471	80	557	5611	17	<10	911	-
	EPH>C12-C16	ug/l	<10	<10	<10	1900	<10	<10	216	-
	EPH>C16-C21	ug/l	35	<10	38	<u>2300</u>	<10	<10	172	(650)
	EPH>C21-C35	ug/l	<u>358</u>	<u>67</u>	<u>465</u>	<u>1100</u>	<u>17</u>	<u><10</u>	<u>377</u>	(6.6)
	EPH>C35-C44	ug/l	78	13	54	11	<10	<10	146	-
	TPH>C5-C44	ug/l	471	80	557	5611	17	<10	911	-
	VPH>C5-C10	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C5-C7	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C7-C8	ug/l	<10	<10	<10	<10	<10	<10	<10	-

EPH/TPH/VPH										
Fraction	Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Pure Phase Solubility
	VPH>C8-C10	ug/l	<10	<10	<10	<10	<10	<10	<10	-
Total	TPH>C5-C44	ug/l	2103	462	3294	16711	118	25	2568	-
	VPH>C5-10,	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	EPH>C10-C44	ug/l	2103	462	3294	16711	118	25	2568	-

5 DISCUSSION

The results of the 1st quarterly monitoring round of 2009 are included in Tables 2 to 8 of the report. For the purpose of the report, the results are compared to the EPA Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004*. A discussion of the results and their significance is included in the subsections below.

The results show that samples obtained from all wells for pH were within the EPA interim guideline range of 6.5 – 9.5. Electrical conductivity was above the guideline value at wells BH102 at 1240 µs/cm.

Factors such as climate, nutrients in the water, suspended solids; organic wastes and groundwater inflow can all influence the DO value. Due to an equipment malfunction temperature and dissolved oxygen are unavailable for quarter 1, 2009. Field observations made at the time of sampling varied from well to well, and a description of colour and odour is presented in Table 2. It was observed that BH104B, MW03 and to a lesser extent BH101 contained an oily residue and a slight odour. Black cloudy water was present in samples obtained from BH103, during sampling contaminated surface water was present below the manhole and covering the wellhead. Although this water was removed before sampling it is likely that this surface water penetrated the well head to a certain degree. This is reflected in the chemical results from BH103, which shows elevated concentrations of certain compounds previously undetected at this well when compared with previous monitoring.

The results of monitoring from 1st Quarter 2009, shows that concentrations of Benzene, Toluene, Xylene and Ethylbenzene were generally above the laboratory detection limit, with the exception of MW03 and Bh103. None of the recorded concentrations exceeded the relevant guideline value. The results are presented in table 3.

The results of monitoring show that a number of concentrations of metals were above the relevant guideline value. The results are presented in Table 4. Results that are shown to be above the relevant guideline values are highlighted in bold.

Polycyclic Aromatic Hydrocarbons (PAH) were generally recorded below laboratory detection limits with the exception of BH103. A number of compounds namely benzo(a)pyrene, benzo(k)fluoranthene and indeno(1,2,3)pyrene recorded concentrations above their respective guideline values. The results are presented in table 5. Results that are shown to be above the relevant guideline values are highlighted in bold. These results are unusual for BH103 and are likely to be due to the ingress of surface water. It must also be noted that due to a quality failure behalf of the laboratory a number of these results are indicative.

Concentrations of phenol were below the relevant guideline value. The results are presented in table 6.

The results of monitoring for semi-volatile organic (SVOCs) and volatile organic (VOCs) compounds show that no compounds were detected above the interim guideline values at any of the wells. No other wells displayed concentrations above the laboratory limit of detection and are consequently below any relevant interim guideline values.

In order to provide a more accurate profile of TPH within the groundwater, speciated hydrocarbon analysis using the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) method was carried out on samples taken at all boreholes. Hydrocarbons were detected at all boreholes. There are however no interim guideline values comparable with the results for extractable, volatile and total petroleum hydrocarbons (EPH/VPH/TPH) presented and these concentrations have therefore been compared with their pure phase solubility in order to place them in context. Concentrations are presented in Table 9 and shown underlined and bolded when are exceeded. A number of the heavier carbon chain fractions recorded concentrations in excess of their pure phase solubility indicating that they are not representative of dissolved phase concentrations in groundwater. Reference should be made to the previous RPS Groundwater Risk Assessment Report MDE0788Rp0001F01 (20/11/2008).

6 CONCLUSIONS

In accordance with the criteria set out in Schedule 4(ii) of the site's Waste Licence Register No. W0184-01, groundwater monitoring was carried out at the ENVA Ireland site on the 5th March 2009 corresponding to the 1st Quarter of 2009. Suitably qualified consultants from RPS collected groundwater samples from 7 on-site monitoring wells and submitted these samples to an accredited laboratory for analysis.

The results presented have been referenced against the Environmental Protection Agency's (EPA) Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004*.

The recorded concentrations of organic compounds in BH103 are inconsistent with previous rounds. This is likely to be due to contaminated surface water entering the borehole prior to sampling and discrepancies in laboratory results but may also indicate change in conditions at this borehole. Particular attention will be paid to this on the next quarterly monitoring round.

APPENDIX A

SAMPLING AND ANALYSIS - METHODS AND DETAILS

A.1.1 Location of Sampling

Enva Ireland Limited

Clonminam Industrial Estate

Portlaoise

Co Laois

A.1.2 Date & Time of Sampling

5th March 2009, Sampling started at 09.30 am

A.1.3 Personnel Present During Sampling

Ronan Murphy, Environmental Consultant, RPS Group, Dublin

A.1.4 Instrumentation

Honda Purge Pump

Waterra Tubing and ball valves

Dip Meter

Environmental Monitoring Kit – pH, EC, (DO and temperature out of service during monitoring)



**Groundwater Quality Monitoring
Enva Ireland Ltd
Quarter 2 2009**

DOCUMENT CONTROL SHEET

Client	Enva Ireland Ltd					
Project Title	Enva Groundwater Monitoring, Quarter 2 2009					
Document Title	Quarterly Groundwater Analysis					
Document No.	MDE0875Rp0002					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
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1 INTRODUCTION

RPS has been commissioned by Enva Ireland Ltd to carry out groundwater quality monitoring for environmental compliance, at their facility in the Clonminam Industrial Estate, Portlaoise, Co Laois. Groundwater monitoring has been carried out in strict accordance with criteria set out in Schedule 4(ii) of the site's Waste Licence Register No. W0184-01.

Enva Ireland has been operating under Waste Licence Register No. W0184-01 since January 2004, and is required to submit a report to the Environmental Protection Agency (EPA) on a quarterly basis, outlining the existing groundwater quality underlying the site.

Suitably qualified environmental consultants from RPS, collected groundwater samples from a series of monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03) within the site boundaries. The samples underwent laboratory analysis for the suite of parameters specified in Schedule 4(ii) of Waste Licence W0184-01. This report outlines the results of the monitoring round conducted on the 27th May 2009, which corresponds to the second quarter of 2009.

2 METHODOLOGY

Groundwater samples were collected from seven on-site groundwater-monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03), using dedicated Waterra tubing, in accordance with RPS's standard sampling protocol. A non-return foot valve was fixed to the bottom of the tubing and inserted into the well, reaching the base of the bore. Separate tubing and foot valves were used at each monitoring well to eliminate the possibility of cross contamination.

Groundwater in the well casing is not considered representative of the groundwater quality at a given location. For this reason, four well volumes were purged from each well prior to collecting the groundwater sample. By the time purging was complete; all field test water parameters (namely pH, Temperature, Electrical Conductivity and Dissolved Oxygen) were within 10% variance in three consecutive measurements. This ensured that the groundwater sample extracted from the monitoring borehole was representative of the water held in the subsurface strata and not water held stagnant in the borehole casing. The purged volumes were calculated on-site from the measured static water levels and total well depths, using an electronic dip meter.

In order to ensure optimal evaluation, the pH, Conductivity and Temperature of the extracted water were continually monitored using a field meter, which was calibrated on the day of use. Groundwater samples were collected in laboratory supplied containers and stored in chilled cool boxes following sampling and during transit to the laboratory. A rigorous chain of custody procedure was used during the sample round.

All groundwater samples were analysed at a UKAS accredited laboratory, *STL*, for the suite of analyses listed in Table 1. Table 1 also indicates the analytical techniques used by the laboratory.

Table 1: Analytical Methodologies – STL Laboratories

Parameter	Analytical Methodology
BTEX	GCMS
Metals	Nitric digest/ICP
Polycyclic Aromatic Hydrocarbons (PAHs)	GC
Phenol	GCMS
Semi-Volatile Organic Compounds	GCMS
Volatile Organic Compounds	GCMS VOC
Extractable Petroloelum Hydocarbons (EPH)	GC-FID
Volatile Petroloelum Hydocarbons (VPH)	GC-FID & GCMS
Total Petroloelum Hydocarbons (TPH)	Headspace GC-FID/GC-FID.

3 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

The Enva Ireland site is located 1km to the west of the River Triogue, sloping to the East and Southeast. The site is low-lying and well drained (Figure 1). According to the Geological Survey of Ireland (GSI) the underlying bedrock consists of Argillaceous Bioclastic Limestone (*Geological Map Sheet No.15*).

The limestone bedrock is classified by the GSI as a locally important aquifer. Perched water is present within the overlying sandy boulder clay. The groundwater in the bedrock aquifer is used regionally as a potable water supply. However, no abstraction wells have been identified within a 1 km radius of the site.

The groundwater vulnerability in the region is classified as 'extreme' due to the high permeability of the subsoil and the shallow groundwater depths (*GSI classification: Groundwater Monitoring Round Report, 2002*).

Figure 1: Site Location

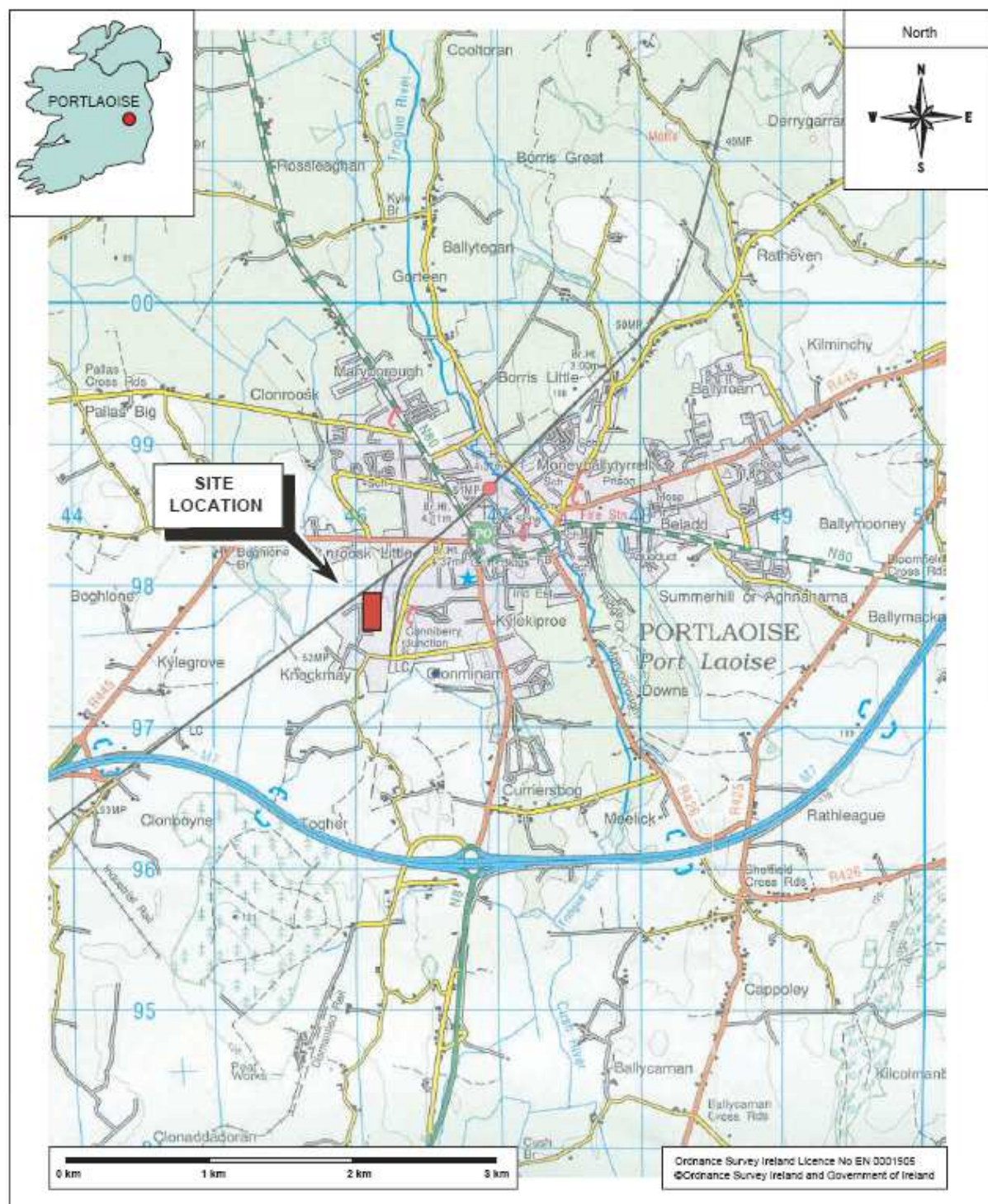
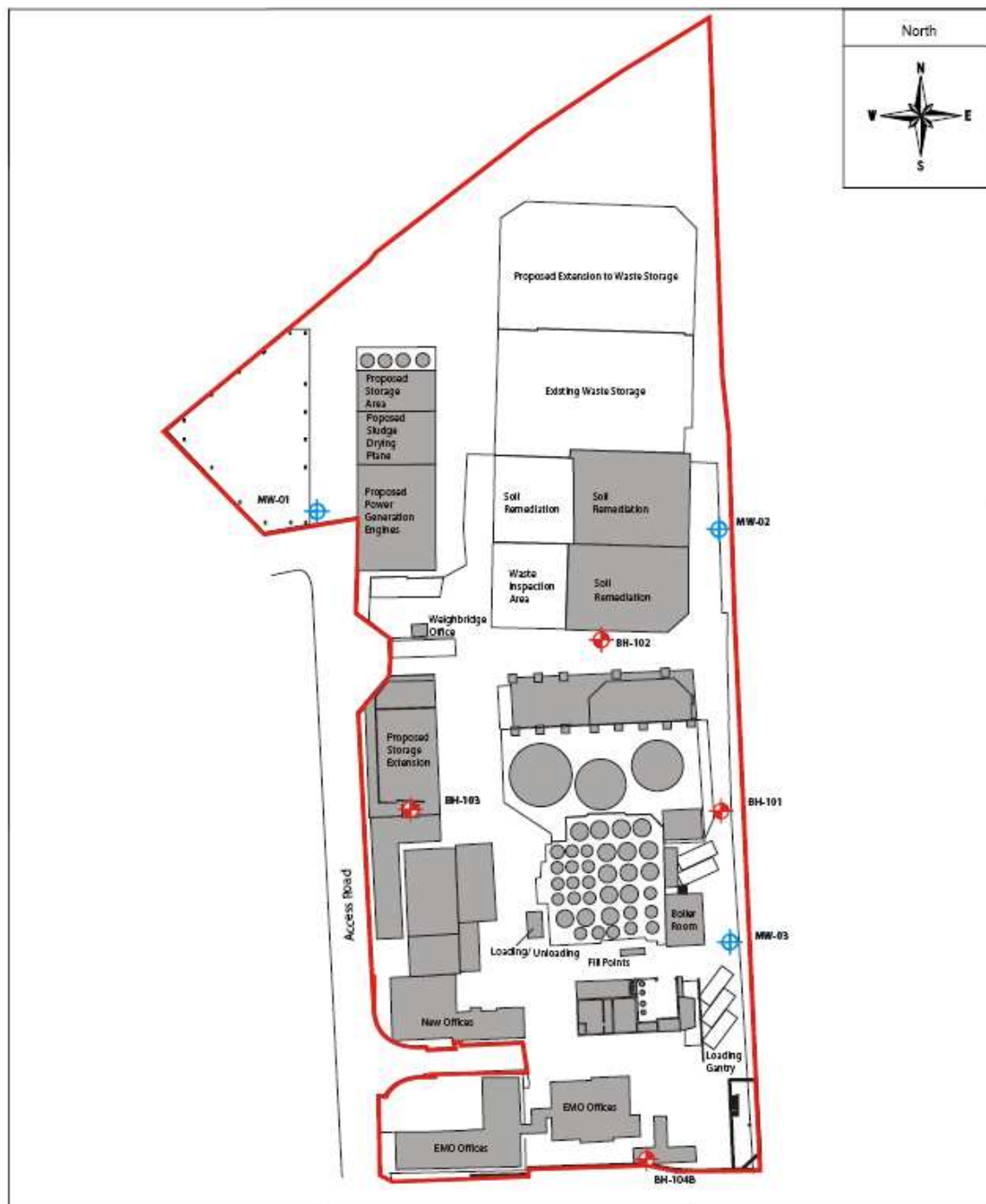




Figure 2: Site Layout Plan

Source: URS Environmental Consultants

Shallow Monitoring Well locations 
 Deep Monitoring Well locations 

4 RESULTS

The results of all field measurements and laboratory analysis are presented in this section.

The results are dicusssed in relation to appropriate guideline values in the section 5. Results that are shown to be above the relevant guideline values are highlighted in bold.

Table 2: Results of Field Parameters Measured at Each Groundwater Monitoring Well

Field Parameters								
Monitoring Well	Depth (m)	Static water Level (m)	Volume Extracted (l)	Dissolved O2 (ppm)	Conductivity (µs/cm)	pH (pH units)	Temp (°C)	Observations
BH101	6.74	1.16	15	n/a	627	7.70	n/a	Slightly Cloudy, Odourless
BH102	6.49	1.77	32	n/a	1060	7.20	n/a	Slightly Cloudy, Odourless
BH103	4.50	0.44	16	n/a	786	7.60	n/a	Slightly Cloudy, Odourless
BH104B	4.73	2.92	40	n/a	524	7.70	n/a	Oily, Cloudy, Suspended Solids
MW01	22.87	3.90	120	n/a	596	7.90	n/a	Cloudy, H2S Odour
MW02	30.00	4.05	157	n/a	565	7.90	n/a	Clear, Odourless
MW03	14.94	0.00	65	n/a	758	7.60	n/a	Oily, Suspended Solids
Interim Guideline Value	-	-	-	-	1000	>6.5 & <9.5	25°C	

Table 3: Results of BTEX in Groundwater Samples

Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values (units as indicated)
BTEX									
Benzene	µg/l	<0.10	<0.10	<0.10	<0.10	0.13	<0.10	0.56	1
Ethyl Benzene	µg/l	<0.10	<0.10	<0.10	0.28	<0.10	<0.10	0.44	10
m&p Xylene	µg/l	<0.10	<0.10	<0.10	0.28	<0.10	<0.10	0.39	-
o-Xylene	µg/l	<0.10	<0.10	<0.10	0.43	<0.10	<0.10	0.51	-
Toluene	µg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.17	10
Total Xylenes	µg/l	<0.20	<0.20	<0.20	0.71	<0.20	<0.20	0.9	10

Table 4: Results of Metals in Groundwater Samples

Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values (units as indicated)
Metals									
Cadmium	mg/l	0.0003	<0.0003	0.0006	0.0003	0.0003	<0.0003	0.0006	0.005
Chromium	mg/l	0.002	0.002	0.002	0.002	<0.001	<0.001	<0.001	0.03
Copper	mg/l	0.014	0.002	0.029	0.005	0.03	0.003	0.018	0.03
Iron	mg/l	1.84	3.54	4.4	1.89	1.19	<0.03	2.47	0.2
Lead	mg/l	0.036	0.009	0.32	0.01	0.015	0.005	0.015	0.01
Magnesium	mg/l	6	9.75	14	4.55	40	36	21	50
Mercury	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.001
Potassium	mg/l	1.85	8.83	1.72	6.09	2.16	1.39	2.8	5
Zinc	mg/l	0.06	0.013	0.055	0.013	0.12	0.003	0.024	0.1
Arsenic	mg/l	0.004	0.005	0.013	0.005	0.004	0.003	0.009	0.01

Table 5: Results of PAHs in Groundwater Samples

PAHs									
Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values
Acenaphthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.35	-
Acenaphthylene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	-
Anthracene	ug/l	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.04	10000
Benzo (a) anthracene	ug/l	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.22	-
Benzo (a) pyrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.18	0.01
Benzo (b) fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.11	
Benzo (g,h,i) perylene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.08	0.05
Benzo (k) fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	
Chrysene	ug/l	<0.01	<0.01	<0.01	<0.01	0.03	0.02	0.33	-
Dibenz (a,h) anthracene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	-
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.08	-
Fluorene	ug/l	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.28	1
Indeno (1,2,3) cd pyrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.07	0.05
Naphthalene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	1
Phenanthrene	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.17	-
Pyrene	ug/l	<0.01	<0.01	<0.01	0.05	0.03	0.03	0.47	-
PAH, Total	ug/l	<0.01	<0.01	<0.01	0.09	0.07	0.28	2.51	-

Table 6: Results of Phenol Concentrations in Groundwater Samples

Phenols									
Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values
Total Phenol (monohydric)	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5

Table 7: Results of SVOC's in Groundwater Samples

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
1,2,4-Trichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.4
1,2-Dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	10
1,3-Dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
1,4-Dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2,4,5-Trichlorophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2,4,6-Trichlorophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	200
2,4-Dichlorophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2,4-Dimethylphenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2,4-Dinitrotoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2,6-Dinitrotoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2-Chloronaphthalene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2-Chlorophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	200
2-Methylnaphthalene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
2-Methylphenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
2-Nitrophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
3&4-Methylphenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
4-Bromophenyl Phenyl Ether	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
4-Chloro-3-methylphenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
4-Chlorophenyl phenyl ether	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
4-Nitrophenol	ug/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	-
Acenaphthene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Acenaphthylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Anthracene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	10000
Benzo(a)anthracene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Benzo(a)pyrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.01
Benzo(b)fluoranthene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.5
Benzo(g,h,i)perylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.05
Benzo(k)fluoranthene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.05
Benzyl Butyl Phthalate	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	
Bis(2-chloroethoxy)methane	ug/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	-
Bis(2-chloroethyl)ether	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Bis(2-chloroisopropyl)ether	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Bis(2-ethylhexyl)phthalate	ug/l	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<20.0	-
Chrysene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Dibenzo(a,h)anthracene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Dibenzofuran	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Diethylphthalate	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Dimethylphthalate	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
di-n-Butylphthalate	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	2
Di-n-octylphthalate	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Diphenylamine	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Fluoranthene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	1
Fluorene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Hexachlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.03
Hexachlorobutadiene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.1
Hexachloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Indeno(1,2,3-c,d)pyrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.05
Isophorone	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Naphthalene	ug/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	1
Nitrobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	10
n-Nitrosodi-n-propylamine	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-
Pentachlorophenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	2
Phenanthrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.2	-
Phenol	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	0.5
Pyrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	-

Table 8: Results of VOC's in Groundwater Samples

VOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
1,1,1,2-tetrachloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1,1-Trichloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	500
1,1,2,2-tetrachloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1,2-trichloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1-Dichloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.2	-
1,1-Dichloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1-Dichloropropene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,3-trichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,3-trichloropropane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,4-trichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.4
1,2,4-trimethylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2-dibromo-3-chloropropane	ug/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-
1,2-dibromoethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2-dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
1,2-Dichloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3
1,2-Dichloropropane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3,5-trimethylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3-dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3-dichloropropane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

VOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
1,4-dichlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,2-Dichloropropane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-chlorotoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-chlorotoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Benzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Bromobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromochloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromodichloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromoform	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromomethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Carbon Tetrachloride	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Chlorobenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Chloroethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Chloroform	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12
Chloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Cis-1,2-dichloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Cis-1,3-dichloropropene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibromochloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibromomethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dichlorodifluoromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dichloromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Ethyl Benzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10

VOC's									
Parameter	Method Detection Limits (ug/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
Hexachlorobutadiene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.1
Isopropylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
m,p-xylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
MTBE	ug/l	<1.0	<1.0	18.8	<1.0	<1.0	<1.0	<1.0	-
Naphthalene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
n-butylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
n-propylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
o-xylene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
p-isopropyltoluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
sec-butylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Styrene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
tert-butylbenzene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Tetrachloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	40
Toluene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Trans-1,2-dichloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Trans-1,3-dichloropropene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Trichloroethene	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	70
Trichlorofluoromethane	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Vinyl Chloride	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

Table 9: Results of EPH/TPH/VPH in Groundwater Samples

EPH/TPH/VPH										
Fraction	Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Pure Phase Solubility
Aliphatic	VPH>C5-C6	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C6-C8	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C8-10	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	EPH>C10-C12	ug/l	<10	<10	<10	29	<10	<10	221	(34)
	EPH>C12-C16	ug/l	<10	<10	15	<10	<10	<10	1920	(0.76)
	EPH>C16-C35	ug/l	386	<10	2400	18	52	<10	19600	(0.0025)
	EPH>C35-C44	ug/l	32	<10	30	<10	11	<10	3510	-
	VPH>C5-C10	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	EPH>C10-C44	ug/l	418	<10	2445	47	63	<10	25300	-
	TPH>C5-C44	ug/l	418	<10	2445	47	63	<10	25300	-
Aromatic	VPH>C5-C7	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C7-C8	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C8-C10	ug/l	<10	<10	<10	<10	<10	<10	<10	-
	EPH>C10-C12	ug/l	<10	<10	<10	122	<10	<10	111	(25,000)
	EPH>C12-C16	ug/l	<10	<10	<10	196	<10	<10	1310	-
	EPH>C16-C21	ug/l	<10	<10	16	21	<10	<10	2000	(650)
	EPH>C21-C35	ug/l	81	<10	454	<10	<10	<10	5010	(6.6)
	EPH>C35-C44	ug/l	17	<10	22	<10	<10	<10	1000	-
	VPH>C5-C10	ug/l	<10	<10	<10	<10	<10	<10	<10	-

EPH/TPH/VPH										
Fraction	Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Pure Phase Solubility
	TPH>C5-C44	ug/l	98	<10	492	339	<10	<10	9430	-
	EPH>C10-C44	ug/l	98	<10	492	339	<10	<10	9430	-
Total	EPH>C10-C44	ug/l	516	<10	2937	386	63	<10	34700	-
	TPH>C5-C44	ug/l	516	<10	2937	386	63	<10	34700	-
	VPH>C5-10,	ug/l	<10	<10	<10	<10	<10	<10	<10	-

Concentrations above the limit of detection are presented in bold and those in above the relevant pure phase solubility value have been underlined and bolded.

5 DISCUSSION

The results of the 2nd quarterly monitoring round of 2009 are included in Tables 2 to 9 of the report. For the purpose of the report, the results are compared to the EPA Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004*. A discussion of the results and their significance is included below.

The results show that samples obtained from all wells for pH were within the EPA interim guideline range of 6.5 – 9.5. Electrical conductivity was above the guideline value at wells BH102 at 1060µs/cm.

Factors such as climate, nutrients in the water, suspended solids; organic wastes and groundwater inflow can all influence the DO value. Due to an equipment malfunction temperature and dissolved oxygen are unavailable for Quarter 2, 2009. Field observations made at the time of sampling varied from well to well, and a description of colour and odour is presented in Table 2. It was observed that BH104B and MW03 contained an oily residue and a slight odour.

The results of monitoring from 2nd Quarter 2009, shows that concentrations of Benzene, Toluene, Xylene and Ethylbenzene were generally below the laboratory detection limit, with the exception of MW03, MW01 and BH103. None of the recorded concentrations exceeded the relevant guideline value. The results are presented in table 3.

The results of monitoring show that a number of concentrations of metals were above the relevant guideline value. The results are presented in Table 4. Results that are shown to be above the relevant guideline values are highlighted in bold.

Polycyclic Aromatic Hydrocarbons (PAH) were generally recorded below laboratory detection limits with the exception of MW02 and MW03. A number of compounds namely benzo (a) pyrene, benzo (g,h,i) perylene and Indeno (1,2,3) cd pyrene recorded concentrations above their respective guideline values. The results are presented in table 5. Results that are shown to be above the relevant guideline values are highlighted in bold. These results are consistent with those obtained during the RPS Groundwater Risk Assessment which is outlined in RPS report MDE0788Rp0001F01 (20/11/2008).

Concentrations of phenol were below the relevant guideline value. The results are presented in table 6.

The results of monitoring for semi-volatile organic (SVOCs) and volatile organic (VOCs) compounds show that no samples recorded concentrations above the laboratory limit of detection and are consequently below any relevant interim guideline values.

In order to provide a more accurate profile of TPH within the groundwater, speciated hydrocarbon analysis using the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) method was carried out on samples taken at all boreholes. Hydrocarbons were detected at all boreholes. There are however no interim guideline values comparable with the results for extractable, volatile and total petroleum hydrocarbons (EPH/VPH/TPH) presented and these concentrations have therefore been compared with their pure phase solubility in order to place them in context. Concentrations are presented in Table 9 and shown underlined and bolded when the pure phase solubility's are exceeded. A number of the heavier carbon chain fractions recorded concentrations in excess of their pure phase solubility indicating that they are not representative of dissolved phase concentrations in groundwater. Reference should be made to the previous RPS Groundwater Risk Assessment Report MDE0788Rp0001F01 (20/11/2008).

During the quarter 1 monitoring round concentrations of organic compounds in BH103 were found to be inconsistent with previous rounds. This was likely to be due to contaminated surface water entering the borehole prior to sampling and discrepancies in laboratory results but may also indicate change in conditions at this borehole. The absence of similar results during this quarters round confirms that temporary surface contamination of the borehole occurred and that concentrations of compounds detected during the quarter 1 monitoring round cannot be deemed as representative of the groundwater quality in the underlying aquifer.

6 CONCLUSIONS

In accordance with the criteria set out in Schedule 4(ii) of the site's Waste Licence Register No. W0184-01, groundwater monitoring was carried out at the ENVA Ireland site on the 27th May 2009 corresponding to the 2nd Quarter of 2009. Suitably qualified consultants from RPS collected groundwater samples from 7 on-site monitoring wells and submitted these samples to an accredited laboratory for analysis.

The results presented have been referenced against the Environmental Protection Agency's (EPA) Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004*.

APPENDIX A

SAMPLING AND ANALYSIS - METHODS AND DETAILS

A.1.1 Location of Sampling

Enva Ireland Limited

Clonminam Industrial Estate

Portlaoise

Co Laois

A.1.2 Date & Time of Sampling

27th May 2009, Sampling started at 09.30 am

A.1.3 Personnel Present During Sampling

Eugene Finnerty, Environmental Consultant, RPS Group, Dublin

A.1.4 Instrumentation

Honda Purge Pump

Waterra Tubing and ball valves

Dip Meter

Environmental Monitoring Kit – pH, EC, (DO and temperature out of service during monitoring)



**Groundwater Quality Monitoring
Enva Ireland Ltd
Quarter 3 2009**

DOCUMENT CONTROL SHEET

Client	Enva Ireland Ltd					
Project Title	Enva Groundwater Monitoring, Quarter 3 2009					
Document Title	Quarterly Groundwater Analysis					
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This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
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1 INTRODUCTION

RPS has been commissioned by Enva Ireland Ltd to carry out groundwater quality monitoring for environmental compliance, at their facility in the Clonminam Industrial Estate, Portlaoise, Co Laois. Groundwater monitoring has being carried out in strict accordance with criteria set out in Schedule 4(ii) of the site's Waste Licence Register No. W0184-01.

Enva Ireland has been operating under Waste Licence Register No. W0184-01 since January 2004, and is required to submit a report to the Environmental Protection Agency (EPA) on a quarterly basis, outlining the existing groundwater quality underlying the site.

Suitably qualified environmental consultants from RPS, collected groundwater samples from a series of monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03) within the site boundaries on the 6th of August 2009. The samples underwent laboratory analysis for the suite of parameters specified in Schedule 4(ii) of Waste Licence W0184-01. This report outlines the results of this monitoring round, which corresponds to the third quarter of 2009.

2 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

The Enva Ireland site is located 1km to the west of the River Triogue, sloping to the East and Southeast (Figure 1). The site is low-lying and well drained. According to the Geological Survey of Ireland (GSI) the underlying bedrock consists of Argillaceous Bioclastic Limestone (*Geological Map Sheet No.15*).

The limestone bedrock is classified by the GSI as a locally important aquifer. Perched water is present within the overlying sandy boulder clay. The groundwater in the bedrock aquifer is used regionally as a potable water supply. However, no abstraction wells have been identified within a 1 km radius of the site.

The groundwater vulnerability in the region is classified as 'extreme' due to the high permeability of the subsoil and the shallow groundwater depths (*GSI classification: Groundwater Monitoring Round Report, 2002*).

Figure 1: Site Location



3 METHODOLOGY

Groundwater samples were collected from seven on-site groundwater-monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03), using dedicated Waterra tubing, in accordance with RPS's standard sampling protocol (See Figure 2). A non-return foot valve was fixed to the bottom of the tubing and inserted into the well, close to the base of the borehole. Separate tubing and foot valves were used at each monitoring well to eliminate the possibility of cross contamination.

Groundwater in the well casing is not considered representative of the groundwater quality at a given location. For this reason, three well volumes were purged from each well prior to collecting the groundwater sample. By the time purging was complete all field test water parameters (namely pH, Temperature, Electrical Conductivity and Dissolved Oxygen) were within 10% variance in three consecutive measurements. This ensured that the groundwater sample extracted from the monitoring borehole was representative of the water held in the subsurface strata and not water held stagnant in the borehole casing. The purged volumes were calculated on-site from the measured static water levels and total well depths using an electronic dip meter.

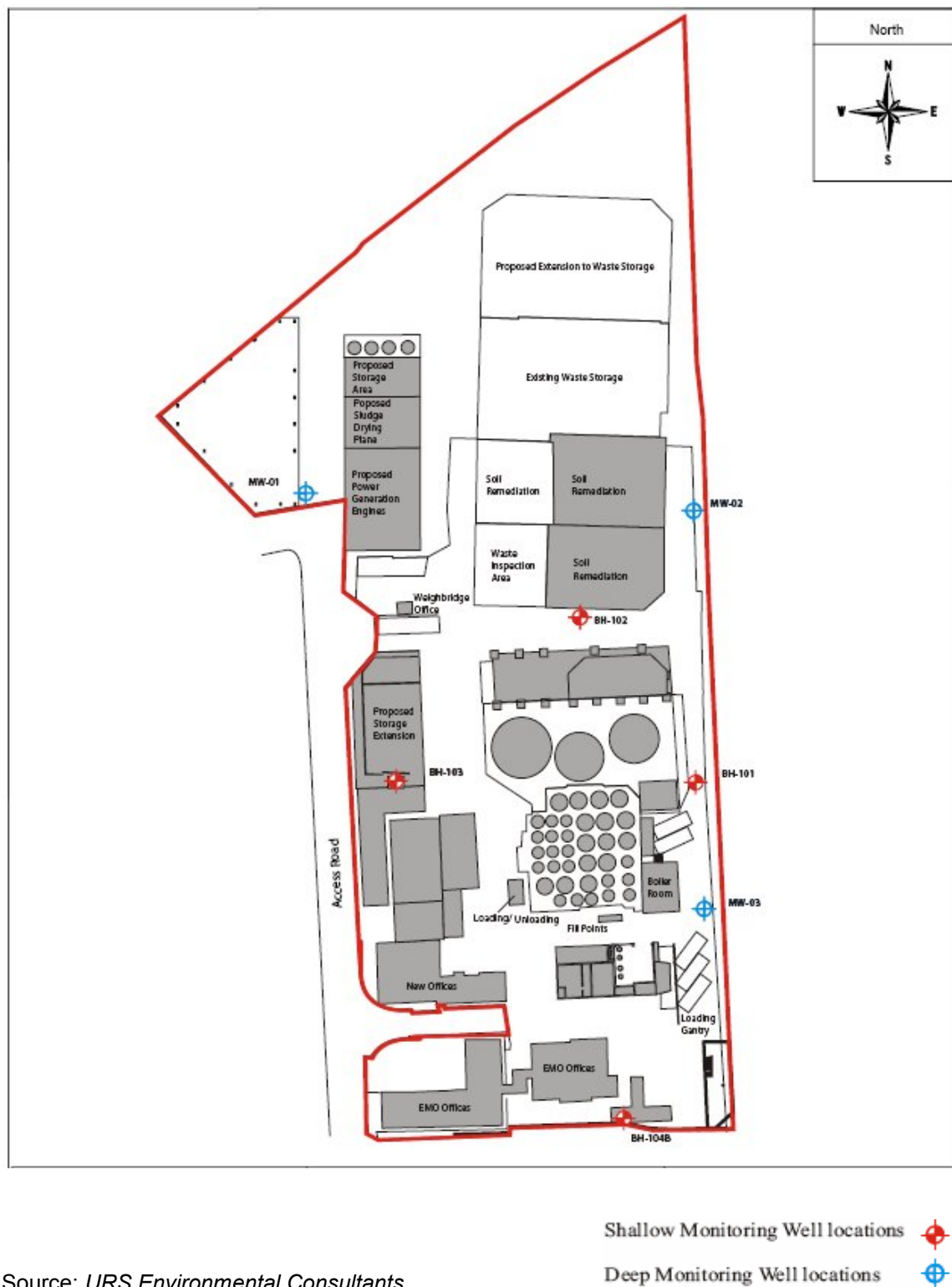
Groundwater samples were collected in laboratory supplied containers and stored in chilled cool boxes following sampling and during transit to the laboratory. A rigorous chain of custody procedure was used during the sample round.

All groundwater samples were analysed at a UKAS accredited laboratory, Severn Trent Laboratories (STL) for the suite of analyses listed in Table 1. Table 1 also indicates the analytical techniques used by the laboratory.

Table 1: Analytical Methodologies – STL Laboratories

Parameter	Analytical Methodology
BTEX	GCMS
Metals	Nitric digest/ICP
Polycyclic Aromatic Hydrocarbons (PAHs)	GC
Phenol	GCMS
Semi-Volatile Organic Compounds	GCMS
Volatile Organic Compounds	GCMS VOC
Extractible Petroleum Hydrocarbons (EPH)	GC-FID
Volatile Petroleum Hydrocarbons (VPH)	GC-FID & GCMS
Total Petroleum Hydrocarbons (TPH)	Headspace GC-FID/GC-FID.

Figure 2: Site Layout Plan



4 RESULTS

The results of all field measurements and laboratory analysis are presented in this section.

The results are discussed in relation to appropriate guideline values in the Section 5. Results that are shown to be above the relevant guideline values are highlighted in bold.

Site-specific field parameter measurements were unable to be collected during the site visit. Laboratory readings for pH and Conductivity parameters were used as an interim measure. In future, field parameter measurement will be undertaken as per RPS Water sampling protocol.

Table 2: Results of Field Parameters Measured at Each Groundwater Monitoring Well

Field Parameters			Laboratory Parameters				Observations
Monitoring Well	Depth of Borehole (m)	Static water Level (mbgl)	Dissolved O ₂ (ppm)	Conductivity (µS/cm)	pH (pH units)	Temp (°C)	
BH101	6.81	4.22	-	664	7.5	-	Cloudy, Odourless
BH102	6.53	3.22	-	920	6.7	-	Clear in colour and H ₂ S odour detected
BH103	4.48	1.87	-	785	7.3	-	Cloudy, slight odour detected
BH104B	4.72	0.53	-	411	7.6	-	Samples were black in colour, with some samples containing sediment, H ₂ S odour detected
MW01	22.95	2.89	-	567	7.7	-	Purged water was black in colour, with clearer water noted as purging continued, H ₂ S odour detected
MW02	30.00	3.95	-	537	7.7	-	Samples clear in colour, H ₂ S odour detected
MW03	14.97	4.19	-	768	7.5	-	Purged water was cloudy in nature, slight odour detected
Interim Guideline Value	-	-	-	1000	>6.5 & <9.5	25°C	

mbgl = meters below ground level

Table 3: Results of BTEX in Groundwater Samples

Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values (units as indicated)
BTEX									
Benzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Ethyl Benzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
m&p Xylene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
o-Xylene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Toluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Total Xylenes	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10

Table 4: Results of Metals in Groundwater Samples

Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values (units as indicated)
Metals									
Cadmium	mg/l	0.0008	0.0009	0.0027	0.0008	0.0022	0.0027	0.0019	0.005
Chromium	mg/l	0.004	<0.001	0.004	<0.001	0.005	<0.001	<0.001	0.03
Copper	mg/l	0.03	0.01	0.095	0.007	0.014	<0.001	0.005	0.03
Iron	mg/l	2.57	12.13	5.29	1.57	7.04	0.12	1.69	0.2
Lead	mg/l	0.039	0.012	0.46	0.029	0.036	0.034	0.029	0.01
Magnesium	mg/l	7.98	11	16	4.91	38	35	22	50
Mercury	mg/l	0.0004	0.0003	0.0002	0.0003	0.0003	0.0003	0.0003	0.001
Potassium	mg/l	2.16	9.23	2.09	6.65	2.27	1.27	1.97	5
Zinc	mg/l	0.1	0.012	0.1	0.017	0.11	0.004	0.026	0.1
Arsenic	mg/l	0.003	0.003	0.015	0.002	0.004	<0.001	0.003	0.01

Table 5: Results of PAHs in Groundwater Samples

PAHs									
Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values
Acenaphthene	µg/l	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	-
Acenaphthylene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-
Anthracene	µg/l	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	0.04	10000
Benzo (a) anthracene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	-
Benzo (a) pyrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01
Benzo (b) fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	
Benzo (g,h,i) perylene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.05
Benzo (k) fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Chrysene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	-
Dibenz (a,h) anthracene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-
Fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	-
Fluorene	µg/l	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	1
Indeno (1,2,3) cd pyrene	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
Naphthalene	µg/l	<0.01	0.02	0.02	0.61	<0.01	0.01	0.04	1
Phenanthrene	µg/l	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	-
Pyrene	µg/l	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	0.19	-
PAH, Total	µg/l	<0.01	0.02	0.02	0.85	<0.01	0.01	0.45	-

Table 6: Results of Phenol Concentrations in Groundwater Samples

Phenols									
Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values
Total Phenol (monohydric)	µg/l	<100	<100	<100	<100	<100	<100	<100	0.5

Table 7: Results of Semi Volatile Organic Compounds (SVOC's) Analysis in Groundwater Samples

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
1,2,4-Trichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.4
1,2-Dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
1,3-Dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,4-Dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,4,5-Trichlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,4,6-Trichlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	200
2,4-Dichlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,4-Dimethylphenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,4-Dinitrotoluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,6-Dinitrotoluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-Chloronaphthalene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-Chlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	200
2-Methylnaphthalene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
2-Methylphenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-Nitrophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
3&4-Methylphenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-Bromophenyl Phenyl Ether	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-Chloro-3-methylphenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-Chlorophenyl phenyl ether	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-Nitrophenol	µg/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-
Acenaphthene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Acenaphthylene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Anthracene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10000
Benzo(a)anthracene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Benzo(a)pyrene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.01
Benzo(b)fluoranthene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.5
Benzo(g,h,i)perylene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.05
Benzo(k)fluoranthene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.05
Benzyl Butyl Phthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Bis(2-chloroethoxy)methane	µg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-
Bis(2-chloroethyl)ether	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bis(2-chloroisopropyl)ether	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bis(2-ethylhexyl)phthalate	µg/l	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	-
Chrysene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibenzo(a,h)anthracene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibenzofuran	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
Diethylphthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dimethylphthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
di-n-Butylphthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2
Di-n-octylphthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Diphenylamine	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Fluoranthene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Fluorene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Hexachlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.03
Hexachlorobutadiene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.1
Hexachloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Indeno(1,2,3-c,d)pyrene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.05
Isophorone	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Naphthalene	µg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	1
Nitrobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
n-Nitrosodi-n-propylamine	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Pentachlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2
Phenanthrene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Phenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.5
Pyrene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

Table 8: Results of Volatile Organic Compounds (VOC's) Analysis in Groundwater Samples

VOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
1,1,1,2-tetrachloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1,1-Trichloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	500
1,1,2,2-tetrachloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1,2-trichloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1-Dichloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.1	-
1,1-Dichloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1-Dichloropropene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,3-trichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,3-trichloropropane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,4-trichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.4
1,2,4-trimethylbenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2-dibromo-3-chloropropane	µg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-
1,2-dibromoethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2-dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
1,2-Dichloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3
1,2-Dichloropropane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3,5-trimethylbenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3-dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3-dichloropropane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,4-dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

VOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
2,2-Dichloropropane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-chlorotoluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-chlorotoluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Benzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Bromobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromochloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromodichloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromoform	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromomethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Carbon Tetrachloride	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Chlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Chloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Chloroform	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12
Chloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Cis-1,2-dichloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Cis-1,3-dichloropropene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibromochloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibromomethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dichlorodifluoromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dichloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Ethyl Benzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Hexachlorobutadiene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.1

VOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
Isopropylbenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
m,p-xylene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
MTBE	µg/l	<1.0	<1.0	12.1	<1.0	<1.0	<1.0	<1.0	-
Naphthalene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
n-butylbenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
n-propylbenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
o-xylene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
p-isopropyltoluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
sec-butylbenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Styrene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
tert-butylbenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Tetrachloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	40
Toluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Trans-1,2-dichloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Trans-1,3-dichloropropene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Trichloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	70
Trichlorofluoromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Vinyl Chloride	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

Table 9: Results of EPH/TPH/VPH in Groundwater Samples

EPH/TPH/VPH										
Fraction	Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Pure Phase Solubility (µg/l)
Aliphatic	VPH>C5-C6	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C6-C8	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C8-10	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C5-C10	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	EPH>C10-C12	µg/l	<10	<10	<10	<10	<10	<10	<10	(34)
	EPH>C12-C16	µg/l	<10	<10	<10	<u>42</u>	<10	<10	<u>114</u>	(0.76)
	EPH>C16-C35	µg/l	<u>40</u>	<10	<u>12</u>	<u>102</u>	<10	<10	<u>910</u>	(0.0025)
	EPH>C35-C44	µg/l	<10	<10	<10	<10	<10	<10	187	-
	EPH>C10-C44	µg/l	40	<10	12	144	<10	<10	1210	-
	TPH>C5-C44	µg/l	40	<10	12	144	<10	<10	1210	-
Aromatic	VPH>C5-C7	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C7-C8	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C8-C10	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C5-C10	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	EPH>C10-C12	µg/l	<10	<10	<10	100	<10	<10	<10	(25,000)
	EPH>C12-C16	µg/l	<10	<10	<10	201	<10	<10	81	-
	EPH>C16-C21	µg/l	<10	<10	<10	51	<10	<10	119	(650)
	EPH>C21-C35	µg/l	<10	<10	<10	15	<10	<10	<u>285</u>	(6.6)
	EPH>C35-C44	µg/l	<10	<10	<10	<10	<10	<10	108	-
	EPH>C10-C44	µg/l	<10	<10	<10	367	<10	<10	593	-

EPH/TPH/VPH										
Fraction	Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Pure Phase Solubility (µg/l)
	TPH>C5-C44	µg/l	<10	<10	<10	367	<10	<10	593	-
Total	EPH>C10-C44	µg/l	40	<10	12	511	<10	<10	1800	-
	TPH>C5-C44	µg/l	40	<10	12	511	<10	<10	1800	-
	VPH>C5-10,	µg/l	<10	<10	<10	<10	<10	<10	<10	-

Concentrations above the limit of detection are presented in bold and those above the relevant pure phase solubility value have been underlined and bolded.

5 DISCUSSION

The results of the 3rd quarterly monitoring round of 2009 are included in Tables 2 to 9 of the report. For the purpose of the report, the results are compared to the EPA Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004*. A discussion of the results and their significance is included below.

Factors such as climate, nutrients in the water, suspended solids; organic wastes and groundwater inflow can all influence the DO value. Due to an equipment malfunction, site-specific field parameters (i.e. Temperature, pH, Conductivity and Dissolved Oxygen) were unable to be collected during the Quarter 3 monitoring period. Field observations made at the time of sampling varied from well to well and a description of colour and odour is presented in Table 2. A hydrogen sulphide odour was detected at BH101, BH104B, MW01 and MW02.

Groundwater samples recorded laboratory pH levels ranging between 6.7 to 7.7, which are within the EPA Interim guideline range of 6.5 to 9.5. Laboratory measurements of Electrical conductivity levels were within the Interim Guideline Value of 1000 $\mu\text{S}/\text{cm}$ at all groundwater well locations.

The results of monitoring from the 3rd Quarter of 2009, demonstrate that concentrations of Benzene, Toluene, Xylene and Ethylbenzene were below the laboratory detection limit. None of the recorded concentrations exceeded the relevant guideline value. The results are presented in Table 3.

The results of the metals analysis indicate that Copper, Iron, Lead, Potassium, Zinc and Arsenic were above the recommended interim guideline values. The remaining parameters were below their respective IGV's at all groundwater monitoring locations. The results are presented in Table 4. Results that are shown to be above the relevant guideline values are highlighted in bold.

Polycyclic Aromatic Hydrocarbons (PAH) were generally recorded below laboratory detection limits with the exception of MW03. Benzo (a) pyrene in MW03 was recorded concentrations slightly above (0.02 $\mu\text{g}/\text{l}$) its recommended guideline value of 0.01 $\mu\text{g}/\text{l}$. The results are presented in Table 5. These results are consistent with those obtained during the RPS Groundwater Risk Assessment, which is outlined in RPS report MDE0788Rp0001F01 (20/11/2008).

During the Quarter 1 monitoring round concentrations of PAH's in BH103 were found to be inconsistent with previous rounds. This was likely to be due to contaminated surface water entering the borehole prior to sampling and discrepancies in laboratory results but may also indicate change in conditions at this borehole. The absence of similar results during Quarter 2 and the current monitoring round, Quarter 3, confirms that temporary surface contamination of the borehole occurred and that concentrations of compounds detected during the Quarter 1 monitoring round cannot be deemed as representative of the groundwater quality in the underlying aquifer.

Concentrations of Phenols were below the laboratory limit of detection. The results are presented in Table 6.

The results of monitoring for semi-volatile organic (SVOCs) and volatile organic (VOCs) compounds show that no samples recorded concentrations above the laboratory limit of detection and are consequently below any relevant interim guideline values. These results are presented in Tables 7 and 8.

In order to provide a more accurate profile of TPH within the groundwater, speciated hydrocarbon analysis using the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) method was carried out on samples taken at all boreholes. Hydrocarbons were detected in boreholes BH101, BH103, BH104B and MW03. No detections were observed in the remaining boreholes. There are however no interim guideline values comparable with the results for extractable, volatile and total petroleum hydrocarbons (EPH/VPH/TPH) presented and these concentrations have therefore been compared with their pure phase solubility in order to place them in context. Concentrations are presented in Table 9 and shown underlined and bolded when the pure phase solubility's are exceeded.

A number of the heavier carbon chain fractions recorded concentrations in excess of their pure phase solubility indicating that they are not representative of dissolved phase concentrations in groundwater. Reference should be made to the previous RPS Groundwater Risk Assessment Report MDE0788Rp0001F01 (20/11/2008).

6 CONCLUSIONS

In accordance with the criteria set out in Schedule 4(ii) of the site's Waste Licence Register No. W0184-01, groundwater monitoring was carried out at the ENVA Ireland site on the 6th August 2009 corresponding to the 3rd Quarter of 2009. A Suitably qualified consultant from RPS collected groundwater samples from 7 on-site monitoring wells and submitted these samples to an accredited laboratory for analysis.

The results presented have been referenced against the Environmental Protection Agency's (EPA) Interim Guideline Values (IGV) as set out in the Interim Report '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland*' 2004.

APPENDIX A

SAMPLING AND ANALYSIS - METHODS AND DETAILS

A.1.1 Location of Sampling

Envia Ireland Limited

Clonminam Industrial Estate

Portlaoise

Co Laois

A.1.2 Date & Time of Sampling

6th August 2009, Sampling started at 09.30 am

A.1.3 Personnel Present During Sampling

Eugene Finnerty, Environmental Consultant, RPS Group, Dublin

A.1.4 Instrumentation

Honda Purge Pump

Waterra Tubing and ball valves

Dip Meter



**Groundwater Quality Monitoring
Enva Ireland Ltd
Final Report Quarter 4 2009**

DOCUMENT CONTROL SHEET

Client	Enva Ireland Ltd					
Project Title	Enva Groundwater Monitoring, Quarter 4 2009					
Document Title	Quarterly Groundwater Analysis					
Document No.	MDE0875Rp0004F01					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
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1 INTRODUCTION

RPS has been commissioned by Enva Ireland Ltd to carry out groundwater quality monitoring for environmental compliance, at their facility in the Clonminam Industrial Estate, Portlaoise, Co Laois. Groundwater monitoring has been carried out in strict accordance with criteria set out in Schedule 4(ii) of the site's Waste Licence Register No. W0184-01.

Enva Ireland has been operating under Waste Licence Register No. W0184-01 since January 2004, and is required to submit a report to the Environmental Protection Agency (EPA) on a quarterly basis, outlining the existing groundwater quality underlying the site.

Suitably qualified environmental consultants from RPS, collected groundwater samples from a series of monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03) within the site boundaries on the 4th of December 2009. The samples underwent laboratory analysis for the suite of parameters specified in Schedule 4(ii) of Waste Licence W0184-01. This report outlines the results of this monitoring round, which corresponds to the final quarter of 2009.

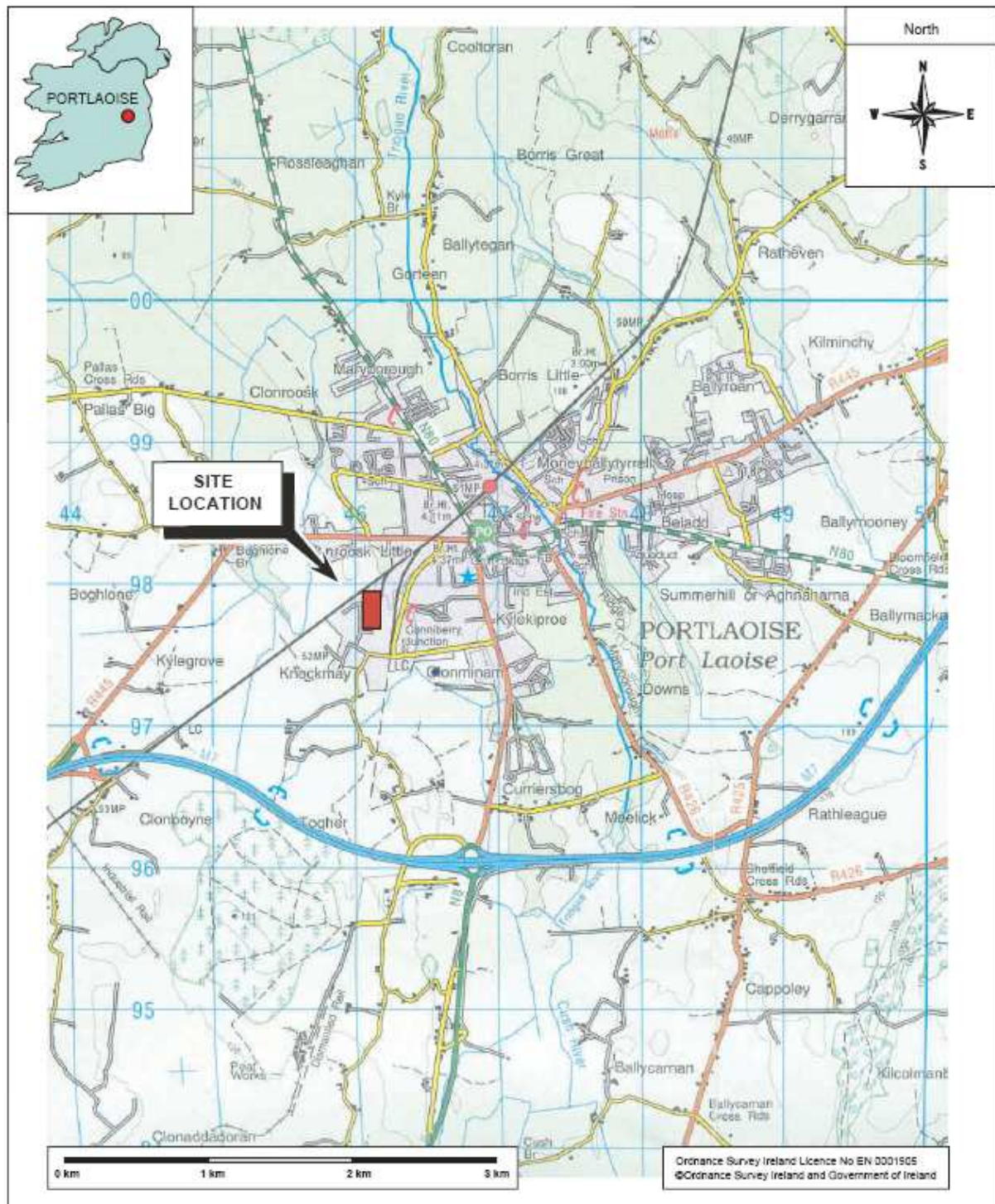
2 GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

The Enva Ireland site is located 1km to the west of the River Triogue, sloping to the East and Southeast (Figure 1). The site is low-lying and well drained. According to the Geological Survey of Ireland (GSI) the underlying bedrock consists of Argillaceous Bioclastic Limestone (*Geological Map Sheet No.15*).

The limestone bedrock is classified by the GSI as a locally important aquifer. Perched water is present within the overlying sandy boulder clay. The groundwater in the bedrock aquifer is used regionally as a potable water supply. However, no abstraction wells have been identified within a 1 km radius of the site.

The groundwater vulnerability in the region is classified as ‘extreme’ due to the high permeability of the subsoil and the shallow groundwater depths (*GSI classification: Groundwater Monitoring Round Report, 2002*).

Figure 1: Site Location



3 METHODOLOGY

Groundwater samples were collected from 7 no. on-site groundwater-monitoring wells (BH101, BH102, BH103, BH104B, MW01, MW02, MW03), (See Figure 2) using dedicated Waterra tubing, in accordance with RPS's standard sampling protocol. A non-return foot valve was fixed to the bottom of the tubing and inserted into the well, close to the base of the borehole. Separate tubing and foot valves were used at each monitoring well to eliminate the possibility of cross contamination.

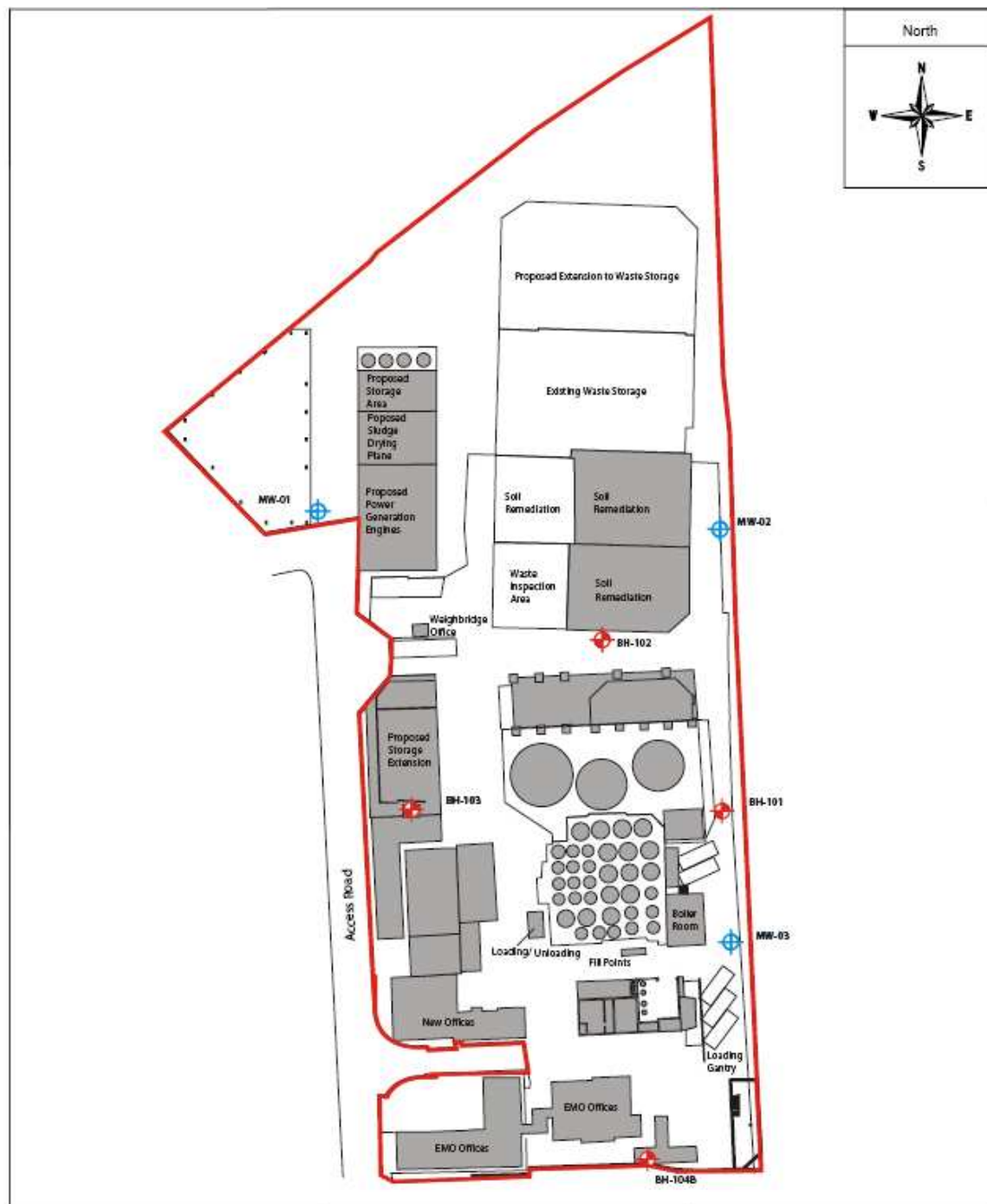
Groundwater in the well casing is not considered representative of the groundwater quality at a given location. For this reason, three well volumes were purged from each well prior to collection of the groundwater sample. By the time purging was complete all field test water parameters (namely pH, Temperature, Electrical Conductivity and Dissolved Oxygen) were within 10% variance in three consecutive measurements. This ensured that the groundwater sample extracted from the monitoring borehole was representative of the water held in the subsurface strata and not water held stagnant in the borehole casing. The purged volumes were calculated on-site from the measured static water levels and total well depths using an electronic dip meter.

Groundwater samples were collected in laboratory supplied containers and stored in chilled cool boxes following sampling and during transit to the laboratory. A rigorous chain of custody procedure was used during the sample round.


All groundwater samples were analysed at a UKAS accredited laboratory, Severn Trent Laboratories (STL) for the suite of analyses listed in Table 1. Table 1 also indicates the analytical techniques used by the laboratory.


Table 1: Analytical Methodologies – STL Laboratories

Parameter	Analytical Methodology
BTEX	GCMS
Metals	Nitric digest/ICP
Polycyclic Aromatic Hydrocarbons (PAHs)	GC
Phenol	GCMS
Semi-Volatile Organic Compounds	GCMS
Volatile Organic Compounds	GCMS VOC
Extractible Petroleum Hydrocarbons (EPH)	GC-FID
Volatile Petroleum Hydrocarbons (VPH)	GC-FID & GCMS
Total Petroleum Hydrocarbons (TPH)	Headspace GC-FID/GC-FID.

Figure 2: Site Layout Plan

Source: URS Environmental Consultants

Shallow Monitoring Well locations 

Deep Monitoring Well locations 

4 RESULTS

The results of all field measurements and laboratory analysis are presented in this section.

The results are discussed in relation to appropriate guideline values in the Section 5. Results that are shown to be above the relevant guideline values are highlighted in bold.

Site-specific field parameter measurements were collected during the site visit as per RPS Water sampling protocol.

Table 2: Results of Field Parameters Measured

Field Parameters			Laboratory Parameters				Observations
Monitoring Well	Depth of Borehole (m)	Static water Level (mbgl)	Dissolved O ₂ (mg/l)	Conductivity (µS/cm)	pH (pH units)	Temp (°C)	
BH101	6.81	3.77	9.78	666	7.49	12.5	Purged water dirty in colour, clearer on purging, oil slick noted on surface
BH102	6.59	2.73	11.50	1091	7.57	8.6	Clear in colour and H ₂ S odour detected
BH103	4.57	1.52	6.35	851	7.57	8.6	Purged water greyish in colour, no odour detected
BH104B	4.72	0.58	12.46	310	7.50	9.6	Samples cloudy with some samples containing sediment, H ₂ S odour detected
MW01	22.95	2.53	11.45	587	7.7	8.2	Purged water dirty in colour, with clearer water noted as purging continued, H ₂ S odour detected
MW02	30.00	3.66	11.24	599	7.53	8.8	Samples clear in colour, no sediment noted, H ₂ S odour detected
MW03	14.85	3.78	10.52	682	7.3	7.8	Purged water was cloudy in nature, slight odour detected
Interim Guideline Value	-	-	-	1000	>6.5 & <9.5	25°C	

mbgl = meters below ground level

Table 3: Results of BTEX

Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values (units as indicated)
BTEX									
Benzene	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.31	1
Ethyl Benzene	µg/l	0.37	<0.1	<0.1	0.18	<0.1	<0.1	0.26	10
m&p Xylene	µg/l	1.85	<0.2	<0.2	0.22	<0.2	<0.2	<0.2	-
o-Xylene	µg/l	0.99	<0.1	<0.1	0.27	<0.1	<0.1	0.21	-
Toluene	µg/l	0.22	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	10
Total Xylenes	µg/l	2.84	<0.2	<0.2	0.49	<0.2	<0.2	0.21	10

Table 4: Results of Metals

Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values (units as indicated)
Metals									
Cadmium	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.005
Chromium	mg/l	0.002	0.002	0.006	<0.001	0.015	<0.001	0.004	0.03
Copper	mg/l	0.025	0.021	0.19	0.005	0.082	0.003	0.029	0.03
Iron	mg/l	1.02	3.83	6.97	0.33	3.88	0.22	2.81	0.2
Lead	mg/l	0.003	0.008	0.81	<0.002	0.09	<0.002	0.006	0.01
Magnesium	mg/l	6.89	11	20	2.55	35	35	21	50
Mercury	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.001
Potassium	mg/l	2.38	11	2.21	5.89	5.52	2.47	3.93	5
Zinc	mg/l	0.079	0.067	0.1	0.004	0.86	0.005	0.087	0.1
Arsenic	mg/l	0.002	0.004	0.02	0.002	0.005	<0.001	0.006	0.01

Note: Elevated levels above the EPA IGVs are highlighted in bold

Table 5: Results of PAHs

PAHs									
Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values
Acenaphthene	µg/l	<0.01	<0.01	0.17	0.05	<0.01	<0.01	0.07	-
Acenaphthylene	µg/l	0.01	<0.01	<0.01	0.01	0.01	<0.01	0.06	-
Anthracene	µg/l	0.03	<0.01	<0.01	0.02	0.08	<0.01	0.75	10000
Benzo (a) anthracene	µg/l	0.02	<0.01	<0.01	<0.01	0.05	<0.01	0.5	-
Benzo (a) pyrene	µg/l	0.04	<0.01	0.01	<0.01	0.03	<0.01	0.27	0.01
Benzo (b) fluoranthene	µg/l	0.04	<0.01	<0.01	<0.01	0.03	<0.01	0.18	
Benzo (g,h,i) perylene	µg/l	0.05	<0.01	0.02	<0.01	0.05	<0.01	0.26	0.05
Benzo (k) fluoranthene	µg/l	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.04	
Chrysene	µg/l	0.04	<0.01	0.01	<0.01	0.07	<0.01	0.49	-
Dibenz (a,h) anthracene	µg/l	0.02	0.01	0.02	0.01	0.02	<0.01	0.06	-
Fluoranthene	µg/l	0.05	<0.01	0.01	0.01	0.1	<0.01	0.15	-
Fluorene	µg/l	0.02	<0.01	<0.01	0.23	<0.01	<0.01	0.07	1
Indeno (1,2,3) cd pyrene	µg/l	0.04	0.01	0.02	<0.01	0.02	<0.01	0.07	0.05
Naphthalene	µg/l	0.03	<0.01	<0.01	0.24	<0.01	<0.01	0.06	1
Phenanthrene	µg/l	0.09	<0.01	<0.01	0.09	0.07	<0.01	0.21	-
Pyrene	µg/l	0.09	<0.01	0.02	0.05	0.39	<0.01	1.36	-
PAH, Total	µg/l	0.57	0.03	0.12	0.85	0.92	<0.01	4.58	-

Note: Elevated levels above the EPA IGVs are highlighted in bold

Table 6: Results of Phenol Concentrations

Phenols									
Parameter	Units	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values (µg/l)
Total Phenol (monohydric)	µg/l	<100	<100	<100	<100	<100	<100	<100	0.5

Table 7: Results of Semi Volatile Organic Compounds (SVOC's) Analysis

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
1,2,4-Trichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.4
1,2-Dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
1,3-Dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,4-Dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,4,5-Trichlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,4,6-Trichlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	200
2,4-Dichlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,4-Dimethylphenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,4-Dinitrotoluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2,6-Dinitrotoluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-Chloronaphthalene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-Chlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	200
2-Methylnaphthalene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
2-Methylphenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-Nitrophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
3&4-Methylphenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-Bromophenyl Phenyl Ether	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-Chloro-3-methylphenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-Chlorophenyl phenyl ether	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-Nitrophenol	µg/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	-
Acenaphthene	µg/l	<0.01	<0.01	<0.01	0.17	<0.01	<0.01	0.07	-
Acenaphthylene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Anthracene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10000
Benzo(a)anthracene	µg/l	0.02	<0.01	<0.01	<0.01	0.05	<0.01	0.5	-
Benzo(a)pyrene	µg/l	0.04	<0.01	0.01	<0.01	0.03	<0.01	0.27	0.01
Benzo(b)fluoranthene	µg/l	0.04	<0.01	<0.01	<0.01	0.03	<0.01	0.18	0.5
Benzo(g,h,i)perylene	µg/l	0.05	<0.01	0.02	<0.01	0.05	<0.01	0.26	0.05
Benzo(k)fluoranthene	µg/l	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.04	0.05
Benzyl Butyl Phthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Bis(2-chloroethoxy)methane	µg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-
Bis(2-chloroethyl)ether	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bis(2-chloroisopropyl)ether	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bis(2-ethylhexyl)phthalate	µg/l	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	-
Chrysene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibenzo(a,h)anthracene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibenzofuran	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

SVOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
Diethylphthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dimethylphthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
di-n-Butylphthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2
Di-n-octylphthalate	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Diphenylamine	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Fluoranthene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Fluorene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Hexachlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.03
Hexachlorobutadiene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.1
Hexachloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Indeno(1,2,3-c,d)pyrene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.05
Isophorone	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Naphthalene	µg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	1
Nitrobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
n-Nitrosodi-n-propylamine	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Pentachlorophenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2
Phenanthrene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Phenol	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.5
Pyrene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

Note: Elevated levels above the EPA IGVs are highlighted in bold

Table 8: Results of Volatile Organic Compounds (VOC's) Analysis

VOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
1,1,1,2-tetrachloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1,1-Trichloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	500
1,1,2,2-tetrachloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1,2-trichloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1-Dichloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	-
1,1-Dichloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,1-Dichloropropene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,3-trichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,3-trichloropropane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2,4-trichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.4
1,2,4-trimethylbenzene	µg/l	13.4	<1.0	<1.0	2.7	<1.0	<1.0	<1.0	-
1,2-dibromo-3-chloropropane	µg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-
1,2-dibromoethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,2-dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
1,2-Dichloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3
1,2-Dichloropropane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3,5-trimethylbenzene	µg/l	3.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3-dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,3-dichloropropane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
1,4-dichlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

VOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
2,2-Dichloropropane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
2-chlorotoluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
4-chlorotoluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Benzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Bromobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromochloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromodichloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromoform	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Bromomethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Carbon Tetrachloride	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Chlorobenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1
Chloroethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Chloroform	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12
Chloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Cis-1,2-dichloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Cis-1,3-dichloropropene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibromochloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dibromomethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dichlorodifluoromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dichloromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Ethyl Benzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Hexachlorobutadiene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.1

VOC's									
Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Interim EPA Guideline Values for Groundwater (µg/l)
Isopropylbenzene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
m,p-xylene	µg/l	2.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
MTBE	µg/l	<1.0	<1.0	6.3	<1.0	<1.0	<1.0	<1.0	-
Naphthalene	µg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	1
n-butylbenzene	µg/l	<1.0	<1.0	<1.0	3.2	<1.0	<1.0	<1.0	-
n-propylbenzene	µg/l	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
o-xylene	µg/l	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
p-isopropyltoluene	µg/l	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	-
sec-butylbenzene	µg/l	<1.0	<1.0	<1.0	2	<1.0	<1.0	<1.0	-
Styrene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
tert-butylbenzene	µg/l	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Tetrachloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	40
Toluene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
Trans-1,2-dichloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Trans-1,3-dichloropropene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Trichloroethene	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	70
Trichlorofluoromethane	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Vinyl Chloride	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-

Note: Elevated levels above the EPA IGVs are highlighted in bold

Table 9: Results of EPH/TPH/VPH

EPH/TPH/VPH										
Fraction	Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Pure Phase Solubility (µg/l)
Aliphatic	VPH>C5-C6	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C6-C8	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C8-10	µg/l	<10	<10	<10	<u>48</u>	<10	<10	<10	-
	VPH>C5-C10	µg/l	<10	<10	<10	<u>48</u>	<10	<10	<10	-
	EPH>C10-C12	µg/l	<10	<10	<10	<10	<10	<10	<100	(34)
	EPH>C12-C16	µg/l	<10	<10	<10	<10	<u>27</u>	<10	<u>690</u>	(0.76)
	EPH>C16-C35	µg/l	<u>33</u>	<u>65</u>	<u>2150</u>	<u>17</u>	<u>1250</u>	<10	<u>5820</u>	(0.0025)
	EPH>C35-C44	µg/l	<10	<10	<u>27</u>	<10	<u>224</u>	<10	<u>1510</u>	-
	EPH>C10-C44	µg/l	<u>33</u>	<u>65</u>	<u>2180</u>	<u>17</u>	<u>1470</u>	<10	<u>8020</u>	-
	TPH>C5-C44	µg/l	<u>33</u>	<u>65</u>	<u>2180</u>	<u>65</u>	<u>1470</u>	<10	<u>8020</u>	-
Aromatic	VPH>C5-C7	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C7-C8	µg/l	<10	<10	<10	<10	<10	<10	<10	-
	VPH>C8-C10	µg/l	<u>19</u>	<10	<10	<10	<10	<10	<10	-
	VPH>C5-C10	µg/l	<u>19</u>	<10	<10	<10	<10	<10	<10	-
	EPH>C10-C12	µg/l	<10	<10	<10	<u>29</u>	<10	<10	<100	(25,000)
	EPH>C12-C16	µg/l	<10	<10	<10	<u>81</u>	<10	<10	<u>303</u>	-
	EPH>C16-C21	µg/l	<u>14</u>	<10	<u>25</u>	<u>18</u>	<u>113</u>	<10	<u>675</u>	(650)
	EPH>C21-C35	µg/l	<10	<u>45</u>	<u>435</u>	<10	<u>360</u>	<10	<u>2290</u>	(6.6)
	EPH>C35-C44	µg/l	<10	<u>31</u>	<u>26</u>	<10	<u>73</u>	<10	<u>978</u>	-
	EPH>C10-C44	µg/l	<u>14</u>	<u>76</u>	<u>486</u>	<u>128</u>	<u>546</u>	<10	<u>4250</u>	-

EPH/TPH/VPH										
Fraction	Parameter	Method Detection Limits (µg/l)	BH101	BH102	BH103	BH104B	MW01	MW02	MW03	Pure Phase Solubility (µg/l)
	TPH>C5-C44	µg/l	<u>33</u>	<u>76</u>	<u>486</u>	<u>128</u>	<u>546</u>	<10	<u>4250</u>	-
Total	EPH>C10-C44	µg/l	<u>47</u>	<u>141</u>	<u>2670</u>	<u>145</u>	<u>2020</u>	<10	<u>10300</u>	-
	TPH>C5-C44	µg/l	<u>66</u>	<u>141</u>	<u>2670</u>	<u>193</u>	<u>2020</u>	<10	<u>10300</u>	-
	VPH>C5-10,	µg/l	<u>22</u>	<10	<10	<u>48</u>	<10	<10	<10	-

Concentrations above the relevant pure phase solubility value have been underlined and bolded.

5 DISCUSSION

The results of the final quarterly monitoring round of 2009 are included in Tables 2 to 9 of the report. For the purpose of the report, the results are compared to the EPA Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004*. A discussion of the results and their significance is included below.

Factors such as climate, nutrients in the water, suspended solids; organic wastes and groundwater inflow can all influence the DO value. Site-specific field parameters (*i.e.* Temperature, pH, Conductivity and Dissolved Oxygen) were collected during the Quarter 4 monitoring period. Field observations made at the time of sampling varied from well to well and a description of colour and odour is presented in Table 2. A hydrogen sulphide odour was detected at BH102, BH104B, MW01 and MW02.

Groundwater samples recorded pH levels ranging between 7.3 to 7.7, which are within the EPA Interim guideline range of 6.5 to 9.5. Field measurements of Electrical conductivity levels were within the Interim Guideline Value of 1000 $\mu\text{S}/\text{cm}$ at all groundwater well locations with the exception of BH102. Dissolved oxygen levels ranged between 6.35 and 12.46 mg/l.

The results of monitoring from the 4th Quarter of 2009, demonstrate that levels of Benzene, Toluene, Xylene and Ethylbenzene were below the laboratory detection limit. Although concentrations were recorded above the laboratory limits of detection no levels were recorded exceeding the relevant guideline values. The results are presented in Table 3.

The results of the metals analysis indicate that Copper, Iron, Lead, Potassium, Zinc and Arsenic levels were recorded above the recommended interim guideline values. The remaining parameters were recorded below their respective IGV's at all groundwater monitoring locations. The results are presented in Table 4.

Polycyclic Aromatic Hydrocarbons (PAH) were generally recorded below laboratory detection limits. Benzo(a)pyrene in BH101 (0.04 $\mu\text{g}/\text{l}$), BH103 (0.01 $\mu\text{g}/\text{l}$), MW01 (0.03 $\mu\text{g}/\text{l}$) and MW03 (0.27 $\mu\text{g}/\text{l}$) was recorded at levels slightly above its recommended guideline value of 0.01 $\mu\text{g}/\text{l}$. Benzo(g,h,i)perylene was detected at levels above the guideline value of 0.05 $\mu\text{g}/\text{l}$ in BH101 (0.05 $\mu\text{g}/\text{l}$), MW01 (0.05 $\mu\text{g}/\text{l}$) and MW03 (0.26 $\mu\text{g}/\text{l}$). Indeno(1,2,3)cd pyrene in MW03 (0.07 $\mu\text{g}/\text{l}$) was detected above the guideline value of 0.05 $\mu\text{g}/\text{l}$. The results are presented in Table 5. These results are consistent with those obtained during the RPS Groundwater Risk Assessment, which is outlined in RPS report MDE0788Rp0001F01, 20/11/2008.

The presence of concentrations of PAH's in BH103 during Quarter 4 are inconsistent with Quarter 2 and Quarter 3. This was likely due to contaminated surface water entering the borehole prior to sampling. The presence of the PAH's confirms that temporary surface contamination of the borehole

occurred and that concentrations of compounds detected during the Quarter 4 monitoring round cannot be deemed as representative of the groundwater quality in the underlying aquifer.

Concentrations of Phenols were below the laboratory limit of detection. The results are presented in Table 6.

No detections of semi-volatile organic (SVOCs) and volatile organic (VOCs) compounds were recorded above the laboratory limits of detection and consequently are below any relevant interim guideline values. These results are presented in Tables 7 and 8.

In order to provide a more accurate profile of TPH within the groundwater, speciated hydrocarbon analysis using the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) method was carried out on samples taken at all boreholes. Hydrocarbons were detected in boreholes BH101, BH102, BH103, BH104B, MW01 and MW03. No detections were observed in MW02. There are however no interim guideline values comparable with the results for extractable, volatile and total petroleum hydrocarbons (EPH/VPH/TPH) presented and these concentrations have therefore been compared with their pure phase solubility in order to place them in context. Concentrations are presented in Table 9 and shown underlined and bolded when the pure phase solubility's are exceeded.

A number of the heavier carbon chain fractions recorded concentrations in excess of their pure phase solubility indicating that they are not representative of dissolved phase concentrations in groundwater. Reference should be made to the previous RPS Groundwater Risk Assessment Report MDE0788Rp0001F01 (20/11/2008).

6 CONCLUSIONS

In accordance with the criteria set out in Schedule 4(ii) of the site's Waste Licence Register No. W0184-01, groundwater monitoring was carried out at the ENVA Ireland site on the 4th December 2009 corresponding to the 4th Quarter of 2009. A Suitably qualified consultant from RPS collected groundwater samples from 7 on-site monitoring wells and submitted these samples to an accredited laboratory for analysis.

The results presented have been referenced against the Environmental Protection Agency's (EPA) Interim Guideline Values (IGV) as set out in the Interim Report *'Towards Setting Guideline Values for the Protection of Groundwater in Ireland' 2004*.

APPENDIX A

SAMPLING AND ANALYSIS - METHODS AND DETAILS

A.1.1 Location of Sampling

Envia Ireland Limited

Clonminam Industrial Estate

Portlaoise

Co Laois

A.1.2 Date & Time of Sampling

4th December 2009

A.1.3 Personnel Present During Sampling

Caitriona Reilly, Environmental Consultant, RPS Group, Dublin

A.1.4 Instrumentation

Honda Purge Pump

Waterra Tubing and ball valves

Dip Meter

Appendix 2

Quarter 1: Effluent Metal Screen

	Detection Method		ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	CV AA	ICP MS
	Method Detection Limit		<120ug/l	<100ug/l	<0.4ug/l	<1ug/l	<1ug/l	<2ug/l	<1ug/l	<1ug/l	<1ug/l	<0.05ug/l	<1ug/l
	UKAS Accredited		✓	✓	✓	✓	✓	✓	✓	✓	✓	•	•
Alcontrol Reference	Sample Identity	Other ID	Dissolved Calcium	Dissolved Magnesium	Dissolved Cadmium Low Level	Dissolved Chromium Low Level	Dissolved Copper Low Level	Dissolved Iron Low Level	Dissolved Manganese Low Level	Dissolved Nickel Low Level	Dissolved Zinc Low Level	Dissolved Mercury Low Level	Dissolved Lead Low Level
			ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
09-B00685-S0013	Quarterly Effluent	Split Sample 18.02.09	389300	10320	<0.4	9	2	957	28	28	28	<0.05	<1

Quarter 2: Effluent Metal Screen

	Detection Method		ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	CV AA	ICP MS
	Method Detection Limit		<120ug/l	<100ug/l	<0.4ug/l	<1ug/l	<1ug/l	<2ug/l	<1ug/l	<1ug/l	<1ug/l	<0.05ug/l	<1ug/l
	UKAS Accredited		✓	✓	✓	✓	✓	✓	✓	✓	✓	•	•
Alcontrol Reference	Sample Identity	Other ID	Dissolved Calcium	Dissolved Magnesium	Dissolved Cadmium Low Level	Dissolved Chromium Low Level	Dissolved Copper Low Level	Dissolved Iron Low Level	Dissolved Manganese Low Level	Dissolved Nickel Low Level	Dissolved Zinc Low Level	Dissolved Mercury Low Level	Dissolved Lead Low Level
			ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Report No: 57182	Quarterly Effluent	D_ENVA_POI_9	660	32.5	<0.220	13.9	<1.60	0.212	20.8	24.4	126	<0.0100	0.526

Quarter 3: Effluent Metal Screen

	Detection Method		ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	CV AA	ICP MS
	Method Detection Limit		<120ug/l	<100ug/l	<0.4ug/l	<1ug/l	<1ug/l	<2ug/l	<1ug/l	<1ug/l	<1ug/l	<0.05ug/l	<1ug/l
	UKAS Accredited		✓	✓	✓	✓	✓	✓	✓	✓	✓	•	•
Alcontrol Reference	Sample Identity	Other ID	Dissolved Calcium	Dissolved Magnesium	Dissolved Cadmium Low Level	Dissolved Chromium Low Level	Dissolved Copper Low Level	Dissolved Iron Low Level	Dissolved Manganese Low Level	Dissolved Nickel Low Level	Dissolved Zinc Low Level	Dissolved Mercury Low Level	Dissolved Lead Low Level
			ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Report No: 61482	Quarterly Effluent	090903-73	0.305	0.0309	<0.220	11.4	<1.60	0.00184	134	13.2	32.7	0.890	<0.01

Quarter 4: Effluent Metal Screen

	Detection Method		ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	ICP MS	CV AA	ICP MS
	Method Detection Limit		<120ug/l	<100ug/l	<0.4ug/l	<1ug/l	<1ug/l	<2ug/l	<1ug/l	<1ug/l	<1ug/l	<0.05ug/l	<1ug/l
	UKAS Accredited		✓	✓	✓	✓	✓	✓	✓	✓	✓	•	•
Alcontrol Reference	Sample Identity	Other ID	Dissolved Calcium	Dissolved Magnesium	Dissolved Cadmium Low Level	Dissolved Chromium Low Level	Dissolved Copper Low Level	Dissolved Iron Low Level	Dissolved Manganese Low Level	Dissolved Nickel Low Level	Dissolved Zinc Low Level	Dissolved Mercury Low Level	Dissolved Lead Low Level
			ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Report No: 61482	Quarterly Effluent	090903-73	0.305	0.0309	<0.220	11.4	<1.60	0.00184	134	13.2	32.7	0.890	<0.01

Appendix 3

Surface water monitoring 2009

Quarter 1 Surface water monitoring

Table1: Surface water monitoring from 1st January to 31st March 2009 for SW01.

Sample Identity	Oils, Fats & Greases	Mineral Oil by GC	pH	Suspended Solids	COD Settled
	ug/l	ug/l	pH Units	mg/l	mg/l
Limit	15000	5000	n/a	60	250
Interceptor 02.01.09 (Enva)	N/A	N/A	7.23		65
Interceptor 07.01.09 (Enva)	N/A	N/A	8.05	28	128
Interceptor 13.01.09 (Enva)	N/A	N/A	7.52		6
Interceptor 19.01.09 (Enva)	N/A	N/A	7.63		15
Interceptor 27.02.09 (Enva)	N/A	N/A	7.79		78
Interceptor 14.01.2009(Geochem)	<1		7.61		27
Interceptor 02.02.09 (Enva)	N/A	N/A	7.29		51
Interceptor 10.02.09 (Enva)	N/A	N/A	7.12	36	142
Interceptor 17.02.09 (Enva)	N/A	N/A	8.87		214
Interceptor 24.02.09 (Enva)	N/A	N/A	9.00		37
Interceptor 12.02.2009 (Geochem)	<1	<10	7.37		30
Interceptor 05.03.09 (Enva)	N/A	N/A	9.00		99
Interceptor 12.03.2009 (Enva)	N/A	N/A	8.69		12
Interceptor 18.03.2009(Enva)	N/A	N/A	8.57		9
Interceptor 25.03.2009 (Enva)	N/A	N/A	8.82		75
Interceptor 30.03.2009 (Enva)	N/A	N/A	9.04		69
Interceptor 11.03.09 (Geochem)	<1	<10	7.46		<15

Surface water monitoring 2009

Quarter 2: Surface water monitoring

Table 2: Surface water monitoring for SW01 from 1st April to 30th June 2009.

Sample Identity	Oils, Fats & Greases	pH	COD Settled	Suspended Solids	Mineral Oil by GC
	ug/l	pH Units	mg/l	mg/l	ug/l
Limit	15000	n/a	250	60	5000
Interceptor 01.04.09 (Enva)	N/A	8.20	58	N/A	N/A
Interceptor 06.04.09 (Enva)	N/A	8.02	84	N/A	N/A
Interceptor 15.04.09 (Enva)	N/A	7.79	41	N/A	N/A
Interceptor 21.04.09 (Enva)	N/A	7.71	23	N/A	N/A
Interceptor 28.04.09 (Enva)	N/A	8.58	55	N/A	N/A
Interceptor 09.04.09 (Alcontrol)	7.11	8.50	47.7	N/A	1150
Interceptor 06.05.2009 (Enva)	N/A	7.98	106	N/A	N/A
Interceptor 12.05.2009 (Enva)	N/A	8.04	104	N/A	N/A
Interceptor 19.05.2009 (Enva)	N/A	7.72	63	N/A	N/A
Interceptor 26.05.2009 (Enva)	N/A	7.78	35	N/A	N/A
Interceptor 07.05.2009 (Alcontrol)	<1	7.74	47.7	N/A	53.5
Interceptor 02.06.2009 (Enva)	N/A	7.46	90	N/A	N/A
Interceptor 08.06.2009 (Enva)	N/A	7.66	59	N/A	N/A
Interceptor 16.06.2009 (Enva)	N/A	7.75	47	N/A	N/A
Interceptor 26.06.2009 (Enva)	N/A	8.08	104	N/A	N/A
Interceptor 29.06.2009 (Enva)	N/A	7.62	101	N/A	N/A
Interceptor 04.06.09 (Alcontrol)	<1.00	8.04	55.9	N/A	<1.00

Surface water monitoring 2009

Table 3: Surface water monitoring for SW02 from 1st April to 30th June 2009

Sample Identity	Oils, Fats & Greases	pH	COD Settled	Suspended Solids	Mineral Oil by GC
Limit	ug/l	pH Units	mg/l	mg/l	ug/l
	15000	n/a	250	60	5000
Interceptor 08.06.2009 (Enva)	N/A	7.79	41	N/A	N/A
Interceptor 19.06.2009 (Enva)	N/A	7.41	55	49	N/A
Interceptor 25.06.2009 (Enva)	N/A	7.87	10	21	N/A
Interceptor 30.06.2009 (Alcontrol)	N/A	7.98	18.7	N/A	<10

Surface water monitoring 2009

Quarter 3: Surface water monitoring

Table 4: Surface water monitoring for SW01 and SW02 from 1st July to 30th September 2009.

	Sample Identity	Oils, Fats & Greases	pH	COD Settled	Suspended Solids	Mineral Oil by GC
	Limit	ug/l	pH Units	mg/l	mg/l	ug/l
		15000	n/a	250	60	5000
SW01	Interceptor 01.07.09 (Enva)	N/A	8.54	60	N/A	N/A
	Interceptor 07.07.09 (Enva)	N/A	7.55	90	N/A	N/A
	Interceptor 15.07.09 (Enva)	N/A	7.66	49	N/A	N/A
	Interceptor 22.07.09 (Enva)	N/A	7.35	74	N/A	N/A
	Interceptor 28.07.09 (Enva)	N/A	7.36	61	N/A	N/A
	Interceptor 31.07.09 (Enva)	N/A	7.35	71	N/A	N/A
	Interceptor 09.07.09 (Alcontrol)	<1.00	8.88	32	N/A	58.9
	Interceptor 05.08.09 (Enva)	N/A	7.16	50	N/A	N/A
	Interceptor 10.08.09(Enva)	N/A	7.04	80	N/A	N/A
	Interceptor 17.08.09(Enva)	N/A	7.61	39	N/A	N/A
	Interceptor 25.08.09(Enva)	N/A	7.60	44	N/A	N/A
	Interceptor 31.08.09(Enva)	N/A	8.47	53	N/A	N/A
	Interceptor 06.08.09 (Alcontrol)	1.01	8.01	48	N/A	99.1
	Interceptor 04.09.09 (Enva)	N/A	8.10	28	N/A	N/A
	Interceptor 10.09.09 (Enva)	N/A	8.99	52	N/A	N/A
	Interceptor 18.09.09 (Enva)	N/A	8.71	33	N/A	N/A
	Interceptor 23.09.09 (Enva)	N/A	7.91	30	N/A	N/A
	Interceptor 30.09.09 (Enva)	N/A	7.71	60	N/A	N/A
	Interceptor 02.09.09	<1.00	7.86	36.2	N/A	<10

Surface water monitoring 2009

	(Alcontrol)					
SW02	Interceptor 10.07.09 (Enva)	N/A	8.80	49	N/A	N/A
	Interceptor 14.07.09 (Enva)	N/A	7.54	33	N/A	N/A
	Interceptor 20.07.09 (Enva)	N/A	7.83	33	N/A	N/A
	Interceptor 27.07.09 (Enva)	N/A	7.35	67	N/A	N/A
	Interceptor 15.07.09 (Alcontrol)	N/A	8.23	<7.00	N/A	298
	Interceptor 05.08.09 (Enva)	N/A	7.82	7	N/A	N/A
	Interceptor 10.08.09 (Enva)	N/A	7.47	64	N/A	N/A
	Interceptor 18.08.09 (Enva)	N/A	8.34	9	N/A	N/A
	Interceptor 25.08.09 (Enva)	N/A	7.92	10	N/A	N/A
	Interceptor 31.08.09 (Enva)	N/A	8.31	29	N/A	N/A
	Interceptor 06.08.09 (Alcontrol)	N/A	8.04	17.2	N/A	<10
	Interceptor 02.09.09 (Enva)	N/A	7.41	22	N/A	N/A
	Interceptor 07.09.09 (Enva)	N/A	7.99	43	N/A	N/A
	Interceptor 14.09.09 (Enva)	N/A	7.55	22	N/A	N/A
	Interceptor 21.09.0.9 (Enva)	N/A	7.42	46	N/A	N/A

Surface water monitoring 2009

Quarter 4: Surface water monitoring

Table 5: Surface water monitoring for SW01 and SW02 from 1st October to 31st December 2009.

	Sample Identity	Oils, Fats & Greases	pH	COD Settled	Suspended Solids	Mineral Oil by GC
		ug/l	pH Units	mg/l	mg/l	ug/l
	Limit	15000	n/a	250	60	5000
SW01	Interceptor 01.10.09 (Enva)	N/A	7.55	68	16	N/A
	Interceptor 08.10.09 (Enva)	N/A	7.52	11	28	N/A
	Interceptor 15.10.09 (Enva)	N/A	7.75	15	10	N/A
	Interceptor 21.10.09 (Enva)	N/A	7.44	80	47	N/A
	Interceptor 28.10.09 (Enva)	N/A	6.59	14	18	N/A
	Interceptor 01.10.09 (Alcontrol)	<1.00	7.76	42.2	19.5	467
	Interceptor 02.11.09 (Enva)	N/A	7.27	46	21	N/A
	Interceptor 10.11.09 (Enva)	N/A	7.48	30	11	N/A
	Interceptor 17.11.09 (Enva)	N/A	7.51	25	24	N/A
	Interceptor 23.11.09 (Enva)	N/A	7.47	59	30	N/A
	Interceptor 02.11.09 (Alcontrol)	2.41	7.63	38.8	8.50	679
	Interceptor 01.12.09 (Enva)	N/A	7.78	34	9	N/A
	Interceptor 07.12.09 (Enva)	N/A	8.48	15	16	N/A
	Interceptor 14.12.09 (Enva)	N/A	7.79	8	9	N/A
	Interceptor 21.12.09 (Enva)	N/A	7.47	27	36	N/A
	Interceptor 03.12.09 (Alcontrol)	1.42	7.79	65.8	13.0	343
	Interceptor 05.10.09 (Enva)	N/A	7.36	51	6	N/A
	Interceptor 12.10.09	N/A	8.15	54	68	N/A

Surface water monitoring 2009

SW02

(Enva)					
Interceptor 19.10.09 (Enva)	N/A	7.20	19	10	N/A
Interceptor 27.10.09 (Enva)	N/A	7.80	26	50	N/A
Interceptor 01.10.09 (Alcontrol)	N/A	7.52	35.2	3.5	123
Interceptor 02.11.09 (Enva)	N/A	7.65	10	31	N/A
Interceptor 10.11.09(Enva)	N/A	7.48	30	11	N/A
Interceptor 17.11.09 (Enva)	N/A	7.84	20	58	N/A
Interceptor 24.11.09 (Enva)	N/A	8.10	8	60	N/A
Interceptor 02.11.09 (Alcontrol)	N/A	7.63	16.7	14	78.5
Interceptor 01.12.09 (Enva)	N/A	7.40	8	16	N/A
Interceptor 07.12.09 (Enva)	N/A	8.38	15	16	N/A
Interceptor 14.12.09 (Enva)	N/A	8.02	10	33	N/A
Interceptor 21.12.09 (Enva)	N/A	7.70	13	20	N/A
Interceptor 03.12.09 (Alcontrol)	N/A	7.78	29.4	11.5	226

Appendix 4



WRIGHT ENVIRONMENTAL

S E R V

CONFIDENTIAL REPORT

Client

Enva Ireland Ltd
Clonminam Industrial Estate
Portlaoise
Co. Laois
Attn. Ms. Anne Phelan

Title

Measure Emissions to Atmosphere
from Boiler - September 2009

Enva Ireland Ltd. – Portlaoise

EPA Waste Licence Reg. No. 184-1

Report Ref: 1046

Report by:

Frances Wright *Frances Wright*
BSc. Pg.Dip. Env , Dip H&S

Date recd:

Approved by:

Paddy Wright *Paddy Wright*
BSc., Pg.Dip.Chem.Eng.

Copies to:

Date:

2nd October 2009

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1. INTRODUCTION

Enva Ireland Ltd. operate a waste recovery facility at Clonminam Industrial Estate, Portlaoise which is licensed under the EPA Waste Licence system (Reg. No. 184-1).

Enva Ireland Ltd are required to measure annually the following emissions to atmosphere from their boiler under Schedule D of their Waste Licence.

- Oxides of Sulphur
- Nitrogen Oxides
- Carbon Monoxide
- Combustion Efficiency

At the request of Ms. Anne Phelan of Enva Ireland Ltd., Wright Environmental Services carried out this monitoring on the 22nd September 2009.

This report contains the results of these tests. There are no limits set for these parameters in the company's licence.

2. RESULTS

Emissions to atmosphere, as required by the company's Waste Licence, were measured from the boiler at Clonminam Industrial Estate, Portlaoise on the 22nd September 2009. The boiler was running on gas during the monitoring periods.

A summary of the concentrations measured are given in Table 1. Detailed test results are presented in Appendix 1. Sampling and analytical methods are presented in Appendix 2.

Table 1

**Summary of Emissions from Boiler
22nd September 2009**

Parameter	Measured mg/Nm³	Measured mg/Nm³	Measured mg/Nm³
	Test 1	Test 2	Test 3
Carbon Monoxide	4	3	1
Nitrogen Oxides (as NO ₂)	113	111	114
Oxides of Sulphur	Less than 5	Less than 5	Less than 5
Combustion Efficiency (%)	82.5	82.8	82.9

Appendix 1

Detailed Test Results

Emissions from Oil Fired Boiler**22nd September 2009 – Test 1**

Time	Temperature	Oxygen	Carbon Monoxide	Nitrogen Oxides	Efficiency
	°C	%	mg/Nm³	mg/Nm³	%
11:39	196	4.3	1	110	82.0
11:40	195	4.2	3	112	82.1
11:41	194	4.1	4	109	82.2
11:42	194	4.1	4	111	82.2
11:43	193	4.0	4	111	82.3
11:44	194	4.0	4	111	82.3
11:45	194	3.9	4	110	82.3
11:46	194	3.9	4	114	82.3
11:47	193	3.9	4	112	82.4
11:48	192	3.8	4	112	82.4
11:49	192	3.8	4	114	82.4
11:50	192	3.8	4	112	82.4
11:51	192	3.8	5	114	82.4
11:52	192	3.8	4	112	82.6
11:53	192	3.8	5	114	82.6
11:54	192	3.7	4	113	82.6
11:55	192	3.7	4	113	82.6
11:56	192	3.7	4	113	82.6
11:57	192	3.7	4	113	82.6
11:58	192	3.7	4	113	82.6
11:59	191	3.7	4	113	82.7
12:00	191	3.7	4	113	82.6
12:01	191	3.7	4	113	82.7
12:02	191	3.7	3	115	82.7
12:03	191	3.7	3	115	82.7
12:04	190	3.6	3	112	82.7
12:05	191	3.7	4	113	82.7
12:06	190	3.6	4	115	82.7
12:07	190	3.7	4	115	82.7
12:08	191	3.6	4	112	82.7
Average	192	3.8	4	113	82.5

Emissions from Oil Fired Boiler**22nd September 2009 – Test 2**

Time	Temperature	Oxygen	Carbon Monoxide	Nitrogen Oxides	Efficiency
	°C	%	mg/Nm³	mg/Nm³	%
12:28	190	3.7	3	105	82.8
12:29	190	3.7	3	105	82.8
12:30	190	3.8	3	108	82.7
12:31	189	3.7	1	109	82.8
12:32	189	3.7	3	109	82.8
12:33	189	3.7	3	107	82.8
12:34	189	3.7	4	109	82.8
12:35	189	3.7	4	109	82.8
12:36	189	3.7	4	109	82.8
12:37	189	3.6	4	111	82.8
12:38	189	3.7	4	111	82.8
12:39	189	3.7	4	111	82.8
12:40	189	3.7	4	111	82.8
12:41	189	3.7	3	111	82.8
12:42	189	3.7	3	111	82.8
12:43	189	3.7	4	111	82.8
12:44	189	3.6	4	113	82.8
12:45	189	3.6	4	111	82.8
12:46	189	3.7	4	113	82.8
12:47	189	3.6	3	113	82.8
12:48	189	3.6	3	111	82.8
12:49	189	3.7	3	113	82.8
12:50	189	3.7	4	111	82.8
12:51	189	3.6	3	113	82.8
12:52	189	3.6	3	113	82.8
12:53	189	3.6	3	113	82.9
12:54	189	3.6	1	113	82.8
12:55	189	3.6	3	113	82.9
12:56	189	3.6	4	113	82.8
12:57	189	3.6	4	113	82.8
Average	189	4	3	111	82.8

Emissions from Oil Fired Boiler**22nd September 2009 – Test 3**

Time	Temperature	Oxygen	Carbon Monoxide	Nitrogen Oxides	Efficiency
	°C	%	mg/Nm³	mg/Nm³	%
13:06	188	3.7	0	109	82.8
13:07	189	3.7	0	111	82.8
13:08	189	3.7	1	111	82.8
13:09	189	3.7	1	113	82.8
13:10	189	3.7	1	113	82.9
13:11	189	3.6	1	113	82.9
13:12	189	3.7	1	113	82.9
13:13	189	3.6	1	113	82.9
13:14	189	3.6	1	113	82.9
13:15	189	3.6	1	113	82.9
13:16	188	3.6	1	115	82.9
13:17	188	3.6	1	115	82.9
13:18	189	3.7	1	113	82.9
13:19	189	3.7	1	113	82.9
13:20	189	3.7	1	113	82.9
13:21	188	3.7	1	113	82.9
13:22	189	3.7	1	115	82.9
13:23	189	3.6	1	115	82.9
13:24	189	3.6	1	115	82.9
13:25	189	3.6	0	117	82.9
13:26	189	3.6	1	117	82.9
13:27	189	3.7	1	115	82.9
13:28	189	3.6	1	115	82.9
13:29	189	3.7	0	115	82.8
13:30	189	3.7	1	115	82.9
13:31	189	3.6	1	115	82.9
13:32	189	3.6	1	115	82.9
13:33	189	3.6	1	117	82.9
13:34	189	3.7	1	117	82.9
13:35	189	3.7	1	117	82.9
Average	189	4	1	114	82.9

Appendix 2

Sampling and Analytical Methods

Sampling and Analytical Methods

Emissions to Atmosphere

Oxides of nitrogen, carbon monoxide, oxygen, temperature and combustion efficiency were measured in the flue gas from the boiler using a Kane-May, Quintox flue gas analyser. Readings were taken at intervals of one minute over a thirty minute period during normal boiler operating conditions and the average for the period calculated. The boiler was running on gas during the monitoring period.

Sulphur Dioxide

Sulphur dioxide was determined using BS EN 14791:2005 Stationary source emissions — Determination of mass concentration of sulphur dioxide — Reference method. This specifies drawing a measured volume of flue gas through dilute hydrogen peroxide and determining the collected sulphate by ion chromatography or by titration by the Thorin method.

Standard Reference Conditions

The concentration of the emissions were calculated and reported in mg/Nm^3 as follows :-

- temperature 273°K
- pressure 101.3 kPa
- dry gas
- corrected to 3% oxygen

Appendix 5



WRIGHT ENVIRONMENTAL

S E R V I C E S

CONFIDENTIAL REPORT

Client

Enva Ireland Ltd
Clonminam Industrial Estate
Portlaoise
Co. Laois
Attn. Ms. Anne Phelan

Title

Annual Environmental Noise Survey
2009
Enva Ireland Ltd. – Portlaoise
EPA Waste Licence Reg. No. 184-1

Report Ref: 1026

Report by: Frances Wright
BSc. Pg Dip. Env., Dip S&H

Date recd:

Approved by: Paddy Wright
BSc. Pg.Dip.Chem.Eng., BOHS Cert.

Copies to:

Date: 15th June 2009

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1. INTRODUCTION:

Enva Ireland Ltd. operate a waste recovery facility at Clonminam Industrial Estate, Portlaoise which is licensed under the EPA Waste Licence system (Reg. No. 184-1). Schedule D of the company's licence requires an annual Environmental Noise Survey to be undertaken.

At the request of Ms. Anne Phelan of Enva Ireland Ltd., Wright Environmental Services carried out this Noise Survey on the 4th June 2009.

This report presents and interprets the results of the survey with reference to the company's Waste Licence noise criteria. The methodology used for the survey is described in Appendix I. Instrumentation and calibration is described in Appendix II. Monitoring locations are shown in the site map in Appendix III. Appendix IV presents the 1/3 octave band analysis of the noise at monitoring locations.

2. SUMMARY

Wright Environmental Services carried out the day (08:00 – 22:00) and night (22:00 – 08:00) Environmental Noise Survey on the 4th June 2009. Noise monitoring was carried out at one noise sensitive location (N4) and four boundary locations (N1, N2, N3, N5).

With the exception of N3 during the night time monitoring, noise levels were below the limit level at the boundary locations. During the night time monitoring at N3 work was in progress adjacent to N3 in the rail yard. There was no activity or noise from Enva during the night time monitoring period. The elevated noise level at this location is therefore attributed to this extraneous noise.

There is no noise audible from Enva at the noise sensitive location N4. This location is on the Knockmay Road. Traffic is the dominant noise source during the day. It is therefore concluded that the elevated noise level measured during the daytime at this location can be mainly attributed to traffic noise and not Enva.

There was no tones audible in the noise emission from the activity at the noise sensitive location (N4). One third octave band analysis of the noise is presented in Appendix IV. A tone was detected at 25 Hz at N 2 during the daytime monitoring. It was however not audible or detected at the noise sensitive location (N 4) and therefore did not have an impact at the noise sensitive location. Tones were perceived and detected at N 3 (at 31.5Hz and 63 Hz) during the night time monitoring. There was no noise audible from Enva during this monitoring period. The tones are therefore attributed to the activity in the rail yard adjacent to N 3.

3. MONITORING RESULTS AND DISCUSSION:

Wright Environmental Services carried out the day (08:00 – 22:00) and night (22:00 – 08:00) Environmental Noise Survey on the 4th June 2009. The monitoring locations are described below and are shown in the site map in Appendix III.

Location **N1**: Along the mid western site boundary.

Location **N2**: In the corner of the site, along the south eastern boundary

Location **N3**: In the corner of the site, along the north eastern boundary.

Location **N4**: Nearby residential area, south east of Enva and railway yard on Knockmay Road, near corner with Marian Avenue.

Location **N5**: North west of Enva site, on the corner with access road for Rowan park halting site (currently deserted).

The following "A-Weighted" data was determined for each discrete sampling period.

- L_{eq}** : The equivalent continuous noise level for the measurement period.
(This is defined as the sound level of a steady sound having the same energy as a fluctuating sound over the specified measuring period).
- L₍₁₎** : The noise level exceeded for 1% of the measurement period.
(This parameter gives a good indication of typical maximum levels.)
- L₍₁₀₎** : The noise level exceeded for 10% of the measurement period.
- L₍₉₀₎** : The noise level exceeded for 90% of the measurement period.
(This is taken to represent the background noise level).

Detailed results are presented in Table 1, 2 and 3 below along with appropriate comments regarding noise in the monitoring environment.

Table 1

Daytime - Boundary Results – 4th June 2009

Monitoring Position	Time	L_{eq} (dBA)	L₁ (dBA)	L₁₀ (dBA)	L₉₀ (dBA)	Comments
N1	17:20 – 17:50	43	53	45	36	Low level hum from Enva. Local industrial traffic leaves adjacent car park audible. 2 trains pass on nearby Portlaoise/Dublin train line. Birds singing.
N2	15:22 – 15:52	54	65	53	47	2 Vans in/out/around site. Noise from boiler room/compressor is the dominant noise source. Forklift in operation near N2. 1 HGV enters site (reversing signal and filling operation). Repair work being carried out adjacent to N2.
N3	15:59 – 16:29	47	60	49	37	Shovel loading stone into dumper approximately 60m away for approximately 5 min. 2 trains pass N3 on the Portlaoise/Dublin train line. Hammering noise from the adjacent Irish Rail yard. Birds singing.
N5	16:37 – 17:07	45	58	45	36	Vans moving in/out Enva. Forklift in operation Enva site. Traffic audible from northwest direction. 2 trains pass.

Table 2

Night-time - Boundary Results – 4th /5th June 2009

Monitoring Position	Time	L_{eq} (dBA)	L₁ (dBA)	L₁₀ (dBA)	L₉₀ (dBA)	Comments
N1	23:57 – 00:27	40	54	40	34	Boiler cuts in and out. Distant noise traffic is audible. 1 train passes.
N2	22:12 – 22:42	45	49	47	41	Boiler is dominant noise source. Boiler cuts in out. Traffic also audible. Extraneous hum from the south east.
N3	22:47 – 23:17	53	58	51	50	Work in operation in adjacent rail yard. This is the dominant noise source. 2 Shovels operating and sitting on idle and a van moving around rail yard. No noise from Enva audible.
N5	23:24 – 23:54	35	40	35	30	Extraneous hum from the south east is dominant noise source. Boiler just audible as it cuts in and out. Distant traffic noise audible.

Table 3

Noise Sensitive Location Results - 4th /5th June 2009

Monitoring Position	Time	L_{eq} (dBA)	L₁ (dBA)	L₁₀ (dBA)	L₉₀ (dBA)	Comments
N4	18:04 – 18:35	60	73	60	34	This location is on the Knockmay Road. Traffic is the dominant noise source. 34 cars, 3 HGVs and 1 van pass. No noise audible from Enva.
N4	00:36 – 01:06	39	47	42	34	Machinery operating in rail yard audible. No noise audible from Enva. No traffic passes.

In accordance with their waste licence, Enva Ireland Ltd are required to comply with maximum noise limit values. Criterion noise levels are set for day and night time and are presented in Schedule C of the licence as follows:

<i>Day</i>	<i>55 dB(A) LAeq(30 minutes)</i>
<i>Night</i>	<i>45 dB(A) LAeq(30 minutes)</i>

Section 7.7.1 allows for a 2 dB(A) exceedance of the limit.

7.1.1 Noise from the activity shall not give rise to sound pressure levels (LAeq 30min) measured at noise sensitive locations which exceed the limit value(s) by more than 2dB(A).

With the exception of N3 during the night time monitoring, noise levels were below the limit level at the boundary locations. During the night time monitoring at N3 work was in progress adjacent to N3 in the rail yard. This was the dominant noise source at this location. Two large machines and a van were operating in the rail yard during the 30 minute monitoring period. There was no activity or noise from Enva during the night time monitoring period. The elevated noise level at this location is therefore attributed to this extraneous noise.

There is no noise audible from Enva at the noise sensitive location N4. This location is on the Knockmay Road. Traffic is the dominant noise source as a high volume of traffic passed this location during the daytime 30 minute monitoring period (34 cars, 3 HGVs and 1 van). It is therefore concluded that the noise level at this location measured during daytime (L_{eq} of 60dB(A)) can be mainly attributed to traffic noise and not Enva.

Section 6.7 of the company's licence states that

“There shall be no clearly audible tonal component or impulsive component in the noise emissions from the activity at the noise sensitive locations.”

The noise was perceived at each of the monitoring locations to investigate the presence of tones. One third octave band analysis of the noise was also carried out at each location. There were no audible or detected tonal component from the noise emission from Enva at the noise sensitive location (N4). A tone was detected at 25 Hz at N 2 during the daytime monitoring. This tonal feature is thought to emanate from the boiler/compressor room. It was however not audible or detected at the noise sensitive location N 4 and therefore did not have an impact at the noise sensitive location. Tones were perceived and detected at N 3 (at 31.5 Hz and 63 Hz) during the night time monitoring. There was no noise audible from Enva during this monitoring period. The tones are therefore attributed to the activity in the rail yard adjacent to N 3. The analysis is presented in Appendix IV.

4. CONCLUSION:

In accordance with their EPA Waste Licence (Reg. No. 184-1), Enva Ireland Ltd are required have an annual noise survey undertaken to ensure compliance with noise criterion in their licence. Wright Environmental Services carried out this environmental noise survey on the 4th June 2009.

Noise monitoring was carried out at one noise sensitive location(N4) and four boundary locations (N1, N2, N3, N5).

With the exception of N3 during the night time monitoring, noise levels were below the limit level at the boundary locations. During the night time monitoring at N3 work was in progress adjacent to N3 in the rail yard. There was no activity or noise from Enva during the night time monitoring period. The elevated noise levels at this location are therefore attributed to extraneous noise.

There is no noise audible from Enva at the noise sensitive location, N4. This location is on the Knockmay Road. Traffic is the dominant noise source during the day. It is therefore concluded that the elevated noise level at this location measured during daytime can be mainly attributed to traffic noise and not Enva.

The noise was perceived at each of the monitoring locations to investigate the presence of tones. One third octave band analysis of the noise was also carried out at each location. A tone was detected at 25 Hz at N 2 during the daytime monitoring. It was however not audible or detected at the noise sensitive location (N 4) and therefore would not have an impact at the noise sensitive location. Tones were perceived and detected at N 3 (at 31.5 Hz and 63 Hz) during the night time monitoring. There was no noise audible from Enva during this monitoring period. The tones are therefore attributed to the activity in the rail yard adjacent to N 3.

In conclusion, the survey results confirm that the facility readily complies with the relevant noise criteria.

APPENDIX I

Methodology

METHODOLOGY

The methodology of the survey was based upon procedures set out in the International Standard, ISO 1996-2 (Acoustics – description and measurement of environmental noise). The following Environmental Protection Agency’s guidance documents were also referenced; “Environmental Noise Survey Guidance Document, 2003” and “Guidance Note For Noise In Relation To Schedule Activities, 2nd Edition , 2006”.

Environmental noise levels were determined by using a Pulsar Model 33 , Type 1 Real Time Sound Level Meter, with half inch condenser microphone. The instrumentation was calibrated directly before and after the noise measurements. Details of the instrumentation and external calibration are presented in Appendix II of this report. A series of 1/3 Octave Band level measurements were simultaneously taken using the Sound Level Analyser and this data was used to evaluate the presence of tones. This analysis is presented in Appendix IV.

Results reported were determined using the fast response, A-Weighting (ref. 20 µPa) and are rounded off to the nearest whole decibel. Monitoring was conducted in relatively calm, dry weather conditions during the day (08:00 – 22:00) and night (22:00 – 08:00). Throughout the monitoring, the microphone was situated 1.5 m above ground level, away from any reflective surfaces. The monitoring equipment was manned throughout the sampling intervals and comments were recorded in order to aid the interpretation of the results.

During the survey air temperature and humidity measurements were undertaken using a Delta Ohm Hygrometer HD 8501 H. Wind speed measurements were taken using a TSI VelociCalc and the wind direction was noted using a compass. Details of the weather conditions are presented in Table below.

Summary of Weather Conditions

Time	Air Temperature °C	Relative Humidity %	Wind Direction	Wind Speed m/s	General Conditions
15:30	24	37	S	0.8	Dry – no precipitation.
22:30	19	48	-	Calm	Dry – no precipitation.

APPENDIX II

Instrumentation and External Calibration Details

INSTRUMENTATION AND EXTERNAL CALIBRATION DETAILS

Instrumentation:

Pulsar Model 33 , Type 1 Real Time Sound Level Meter, with half inch condenser microphone, Serial Number T223417.

On-site calibrations were carried out before and after sampling with a Pulsar Calibrator – model 100B, Serial Number: 42171.

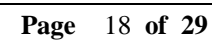
External Calibration:

External Calibration of instrumentation was undertaken by Pulsar Instruments Plc:

Unit	Date of Calibration	Calibration Certificate Number
Sound Level Meter Serial No. T223417	11 th November 2008	164696
Calibrator – Serial No. 42171	11 th November 2008	164697

APPENDIX III

Site Plan showing Noise Monitoring Positions



APPENDIX IV

1/3 Octave Band Analysis (OBA)

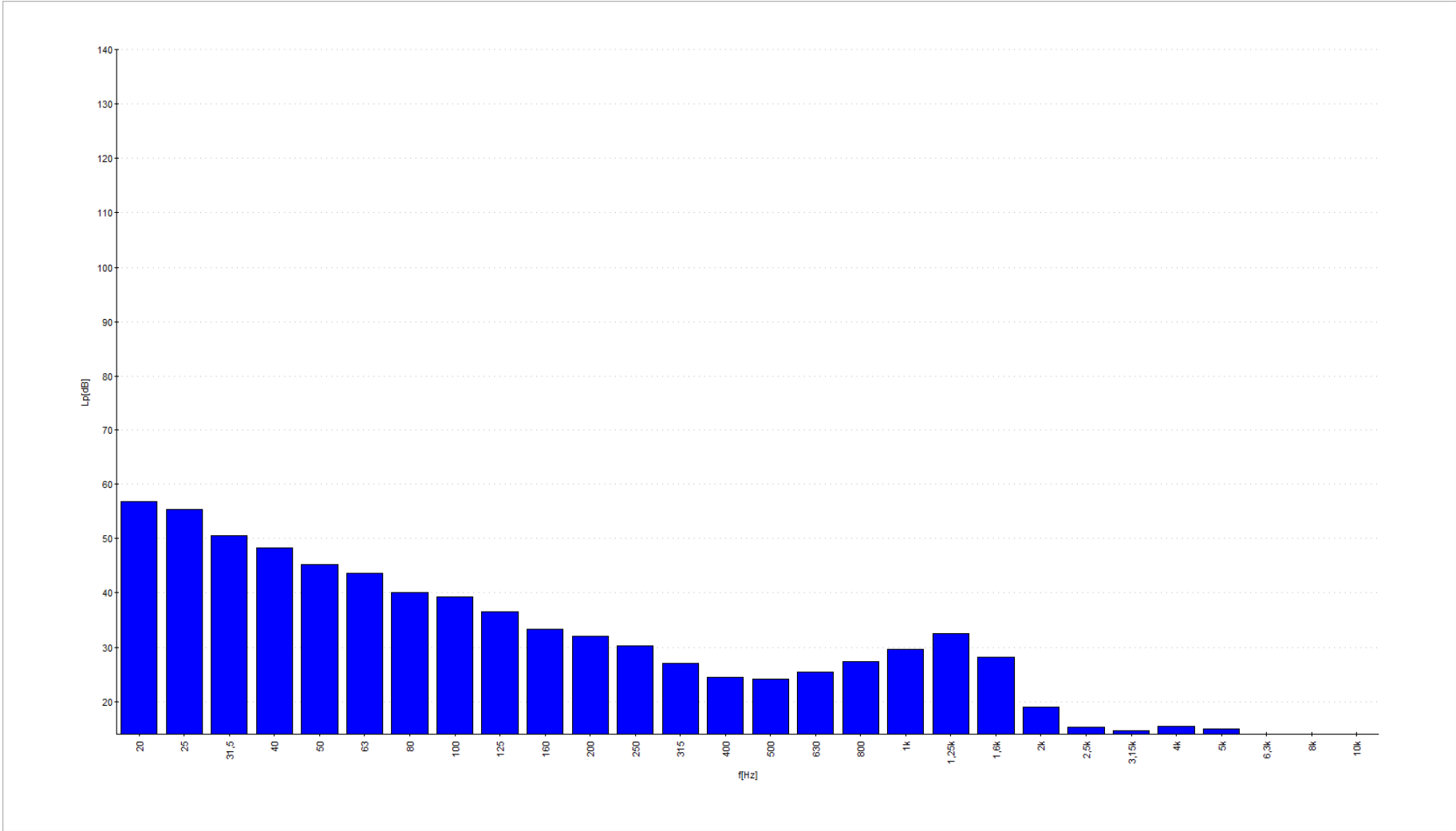


Figure 1: N 1 - Daytime

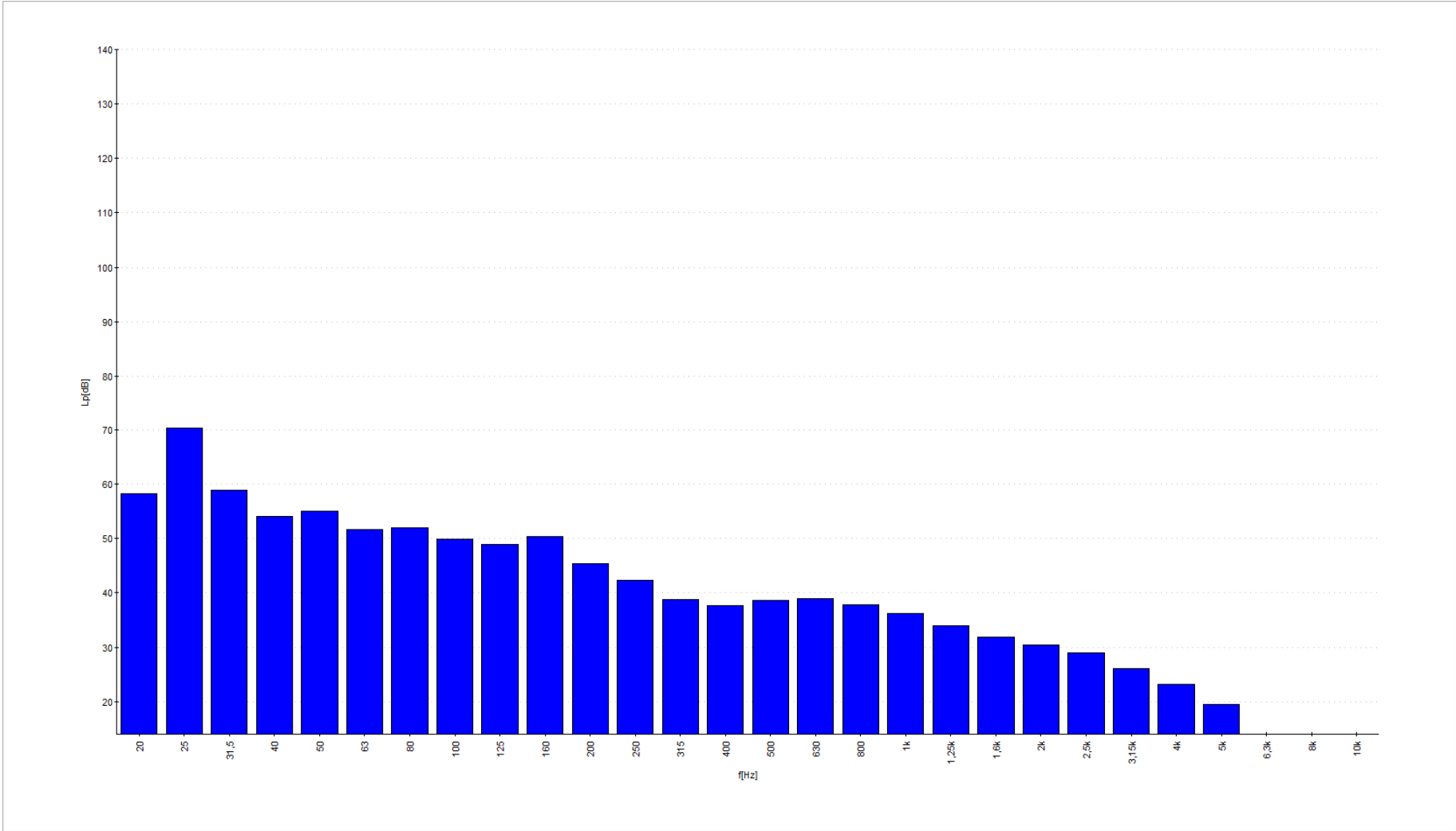


Figure 2: N 2 - Daytime

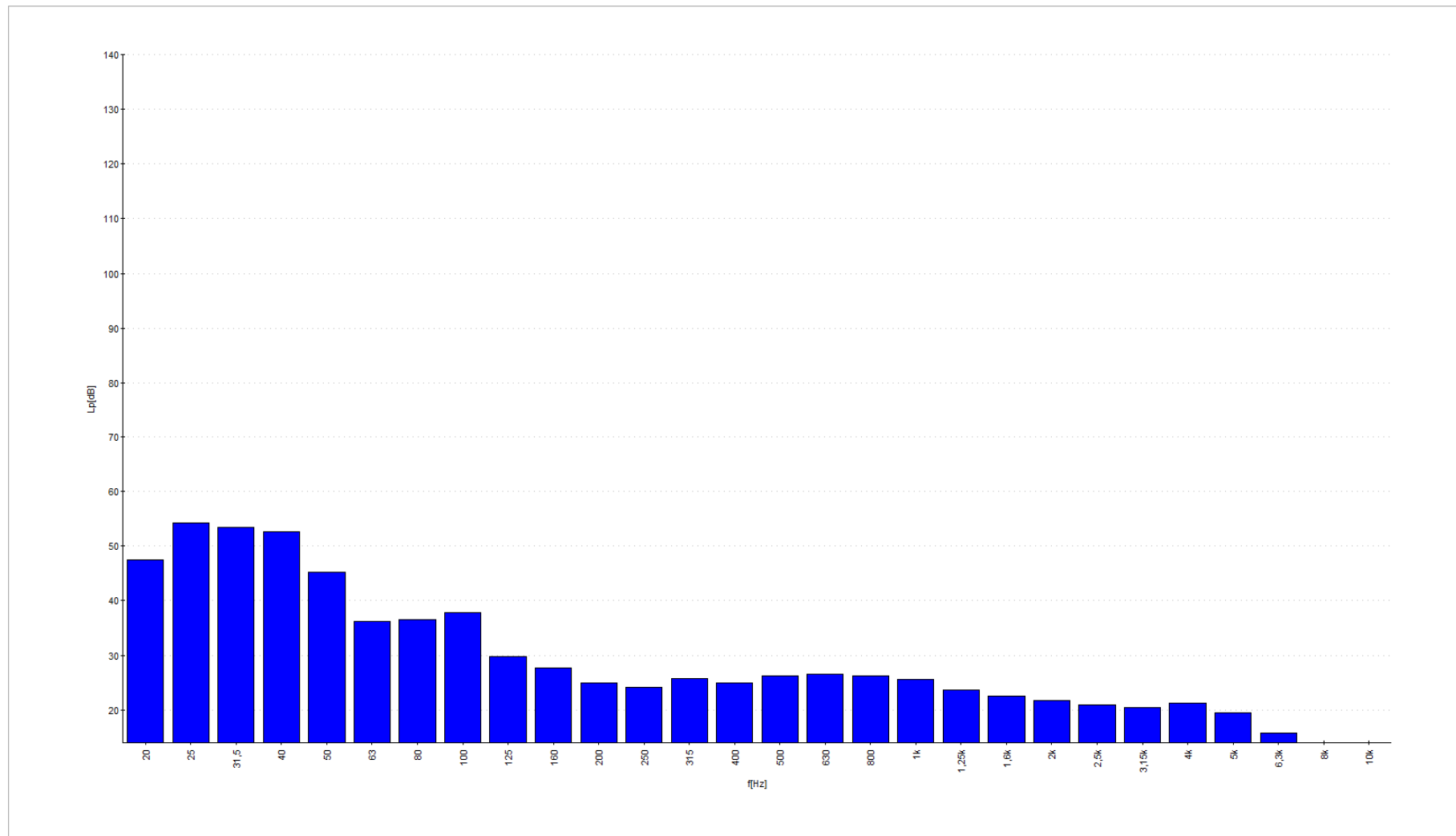


Figure 3: N 3 - Daytime

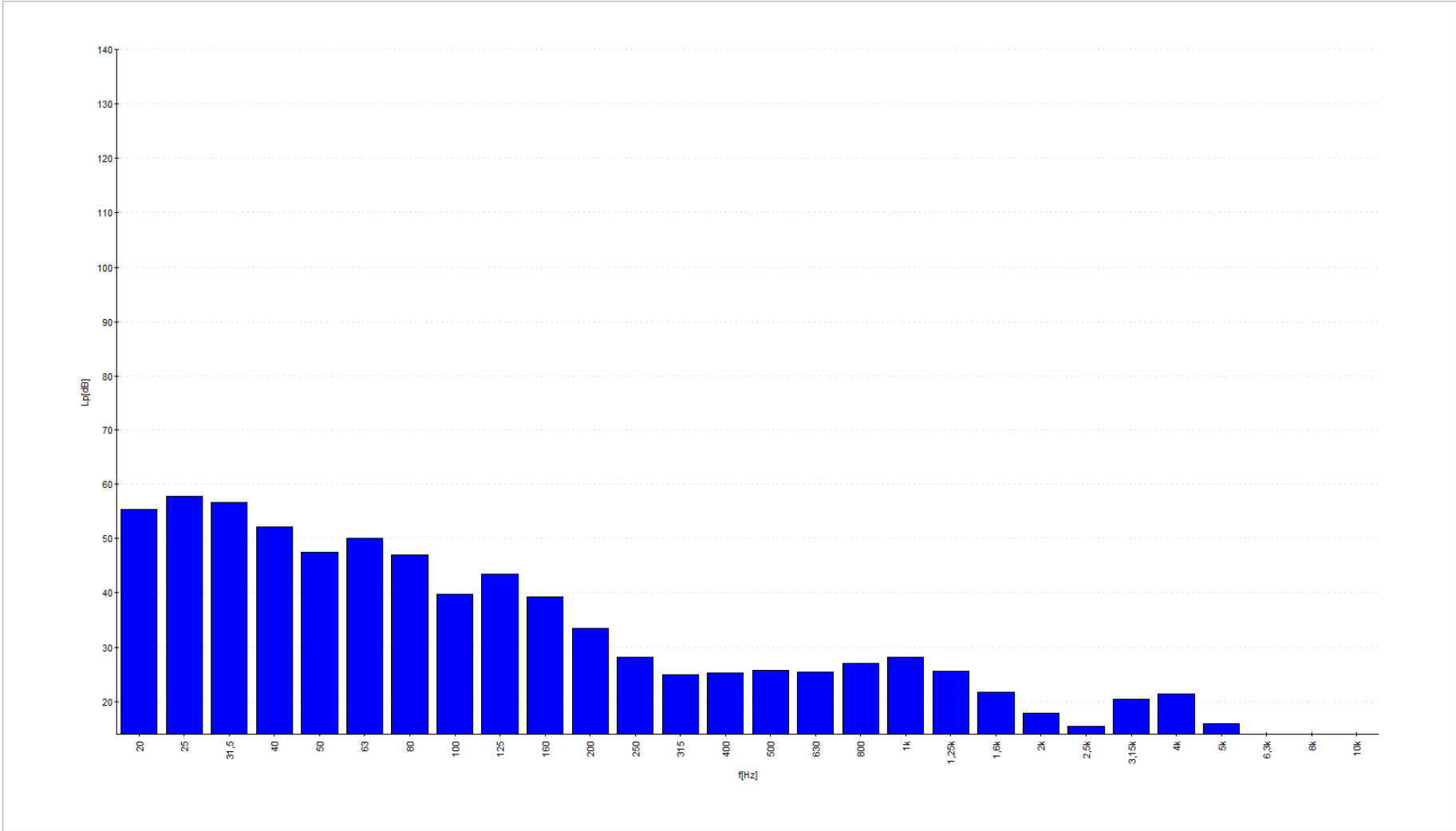


Figure 4: N 4 - Daytime

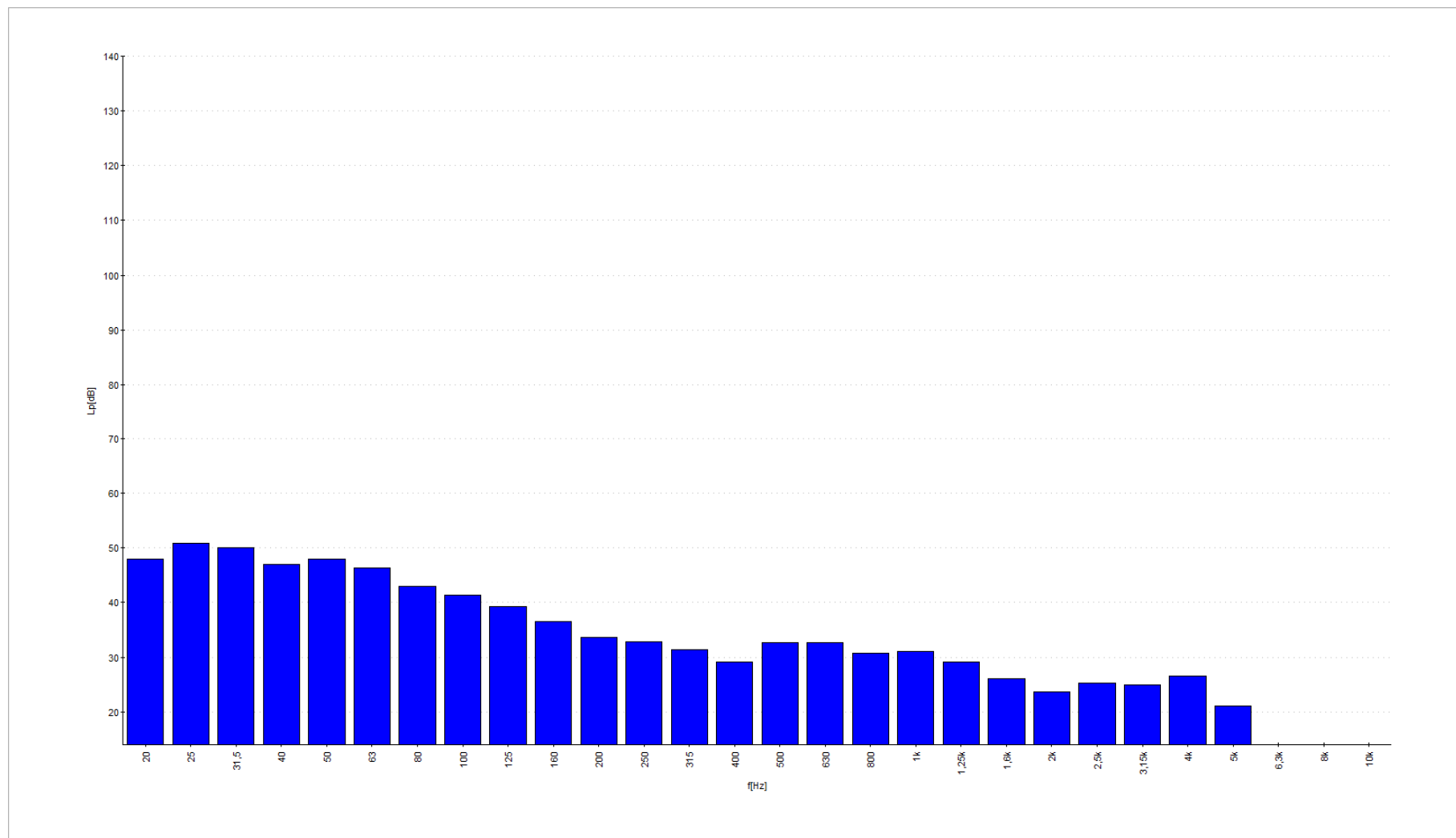


Figure 5: N 5 – Day time

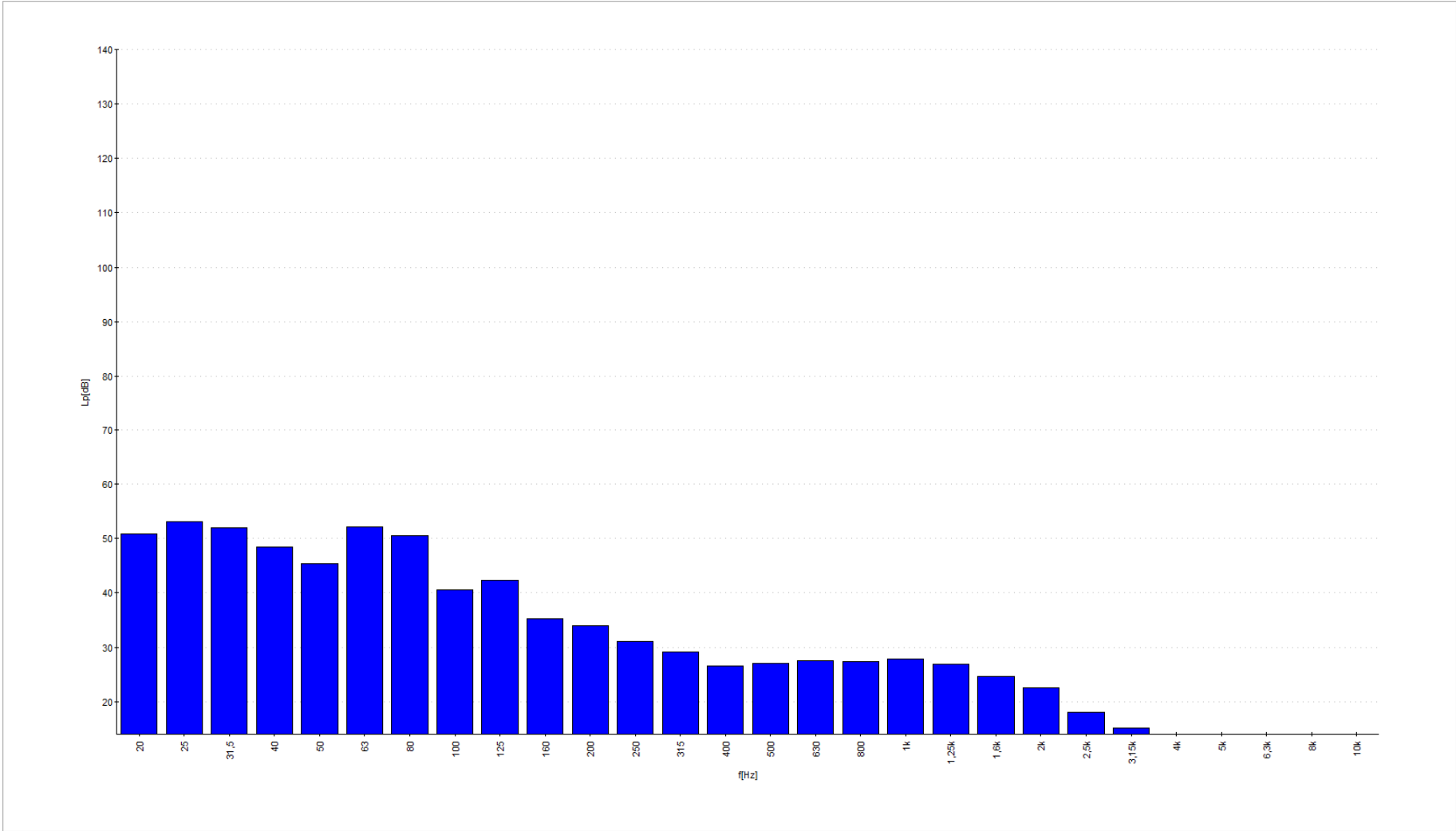


Figure 6: N 1 – Night time

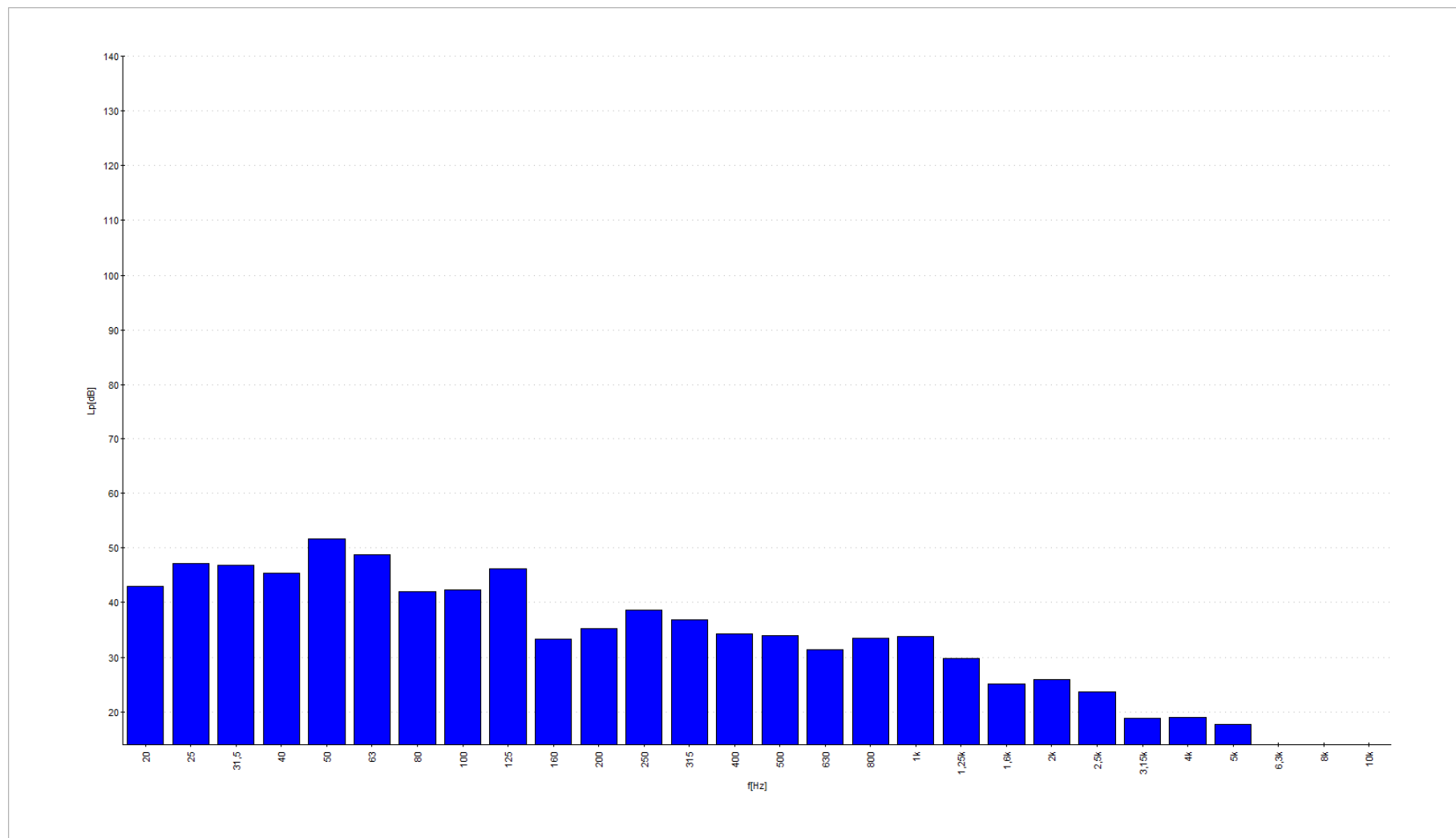


Figure 7: N 2 – Night time

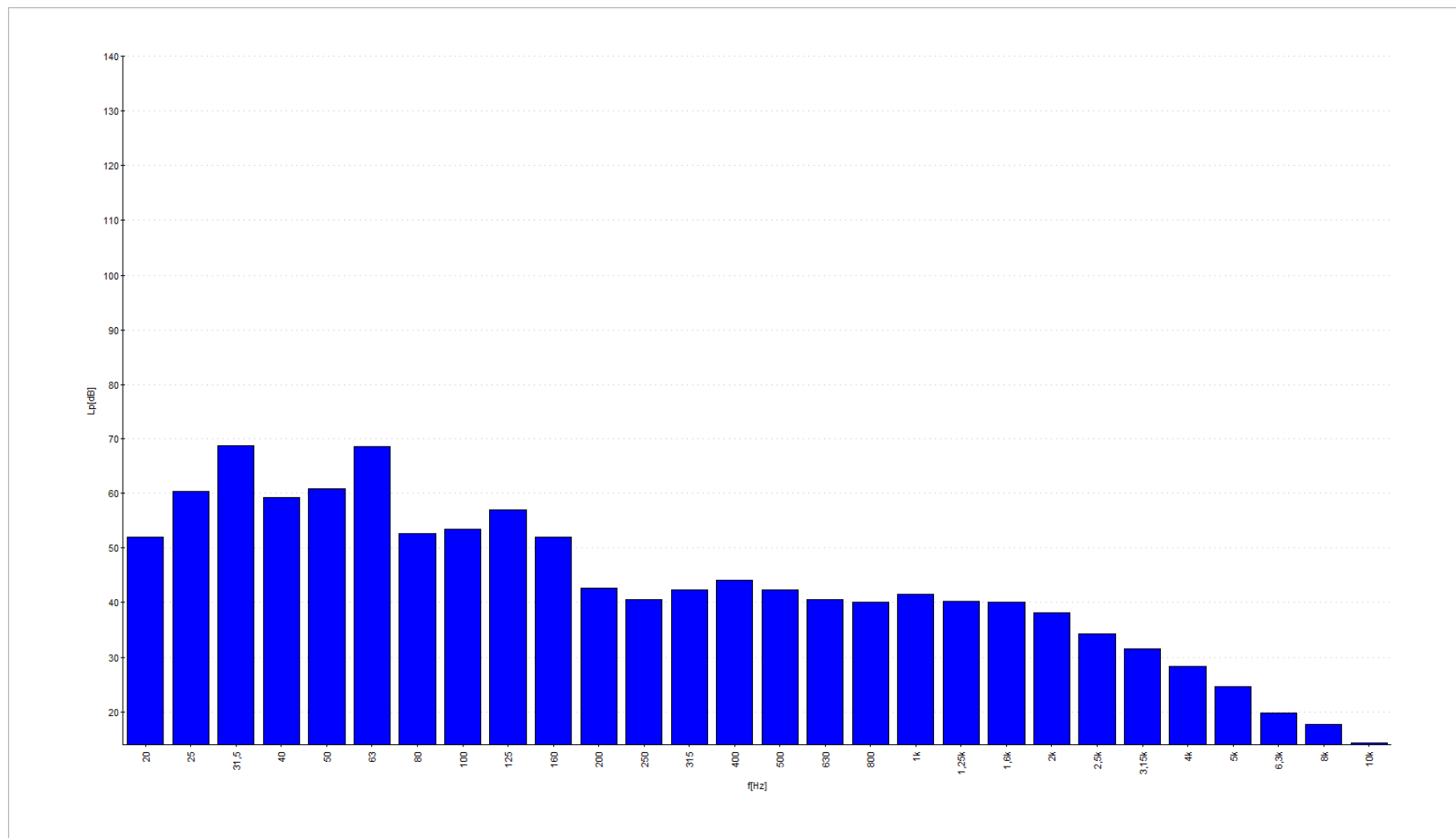


Figure 8: N 3 – Night time

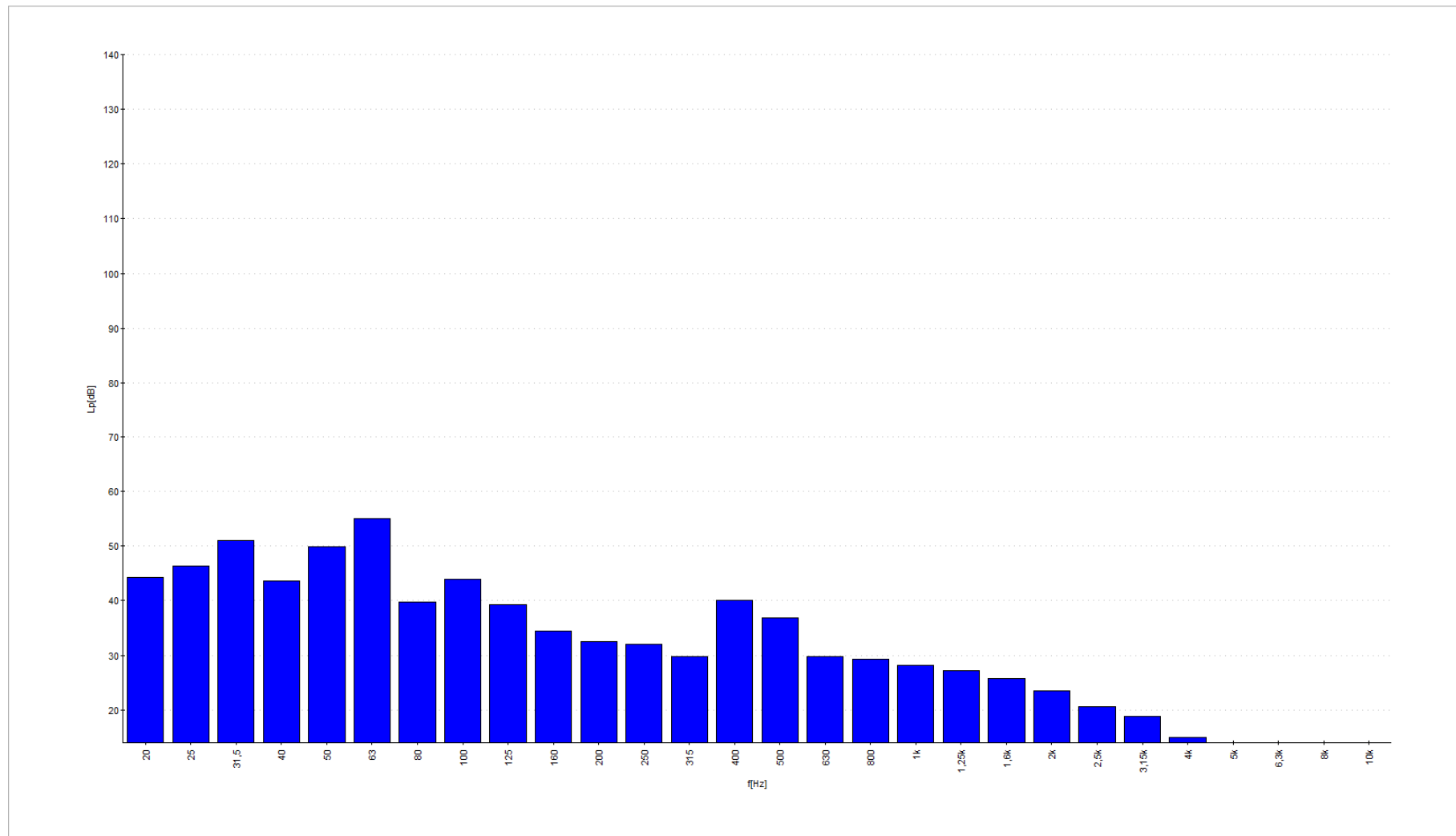


Figure 9: N 4 – Night time

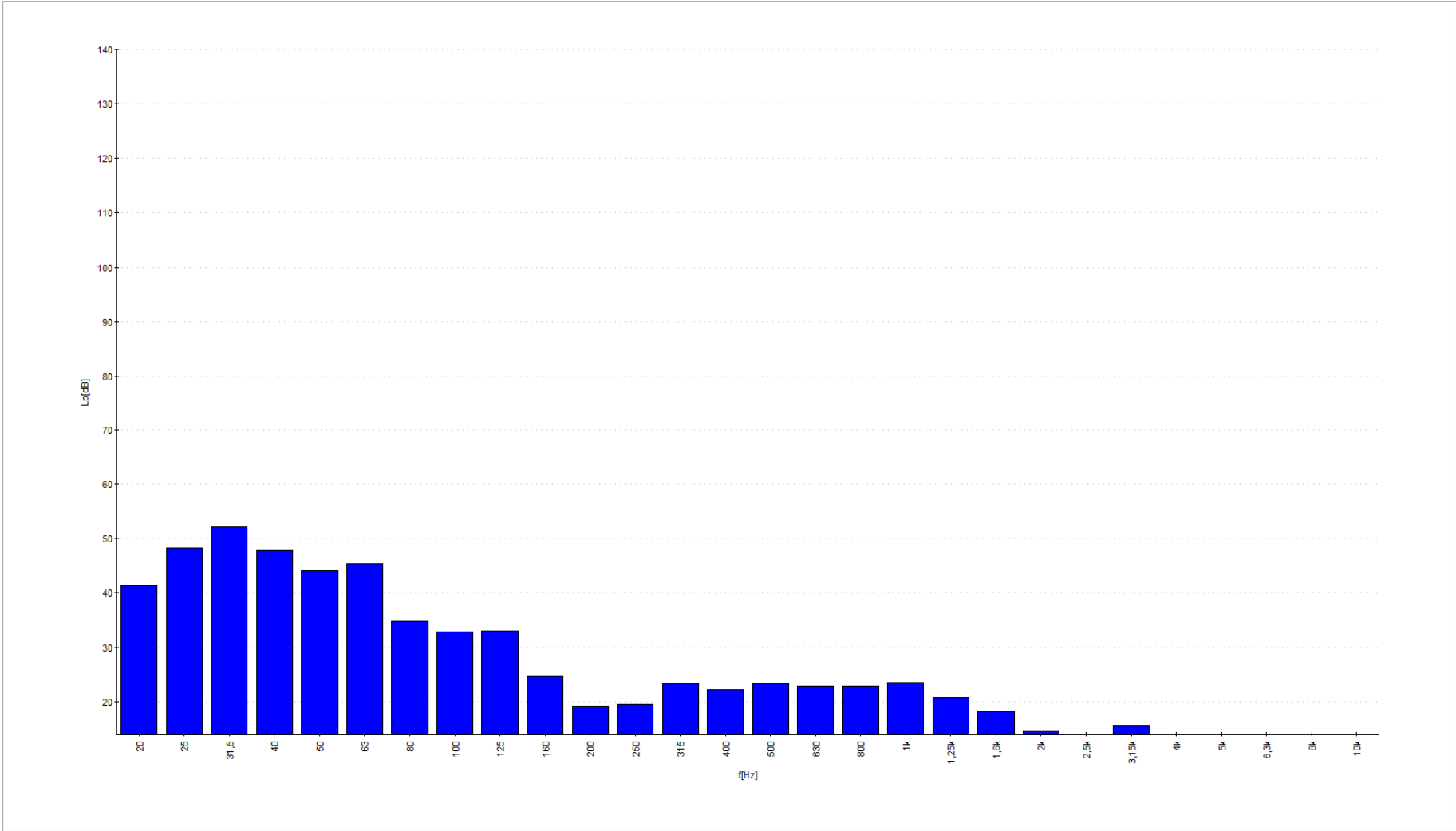
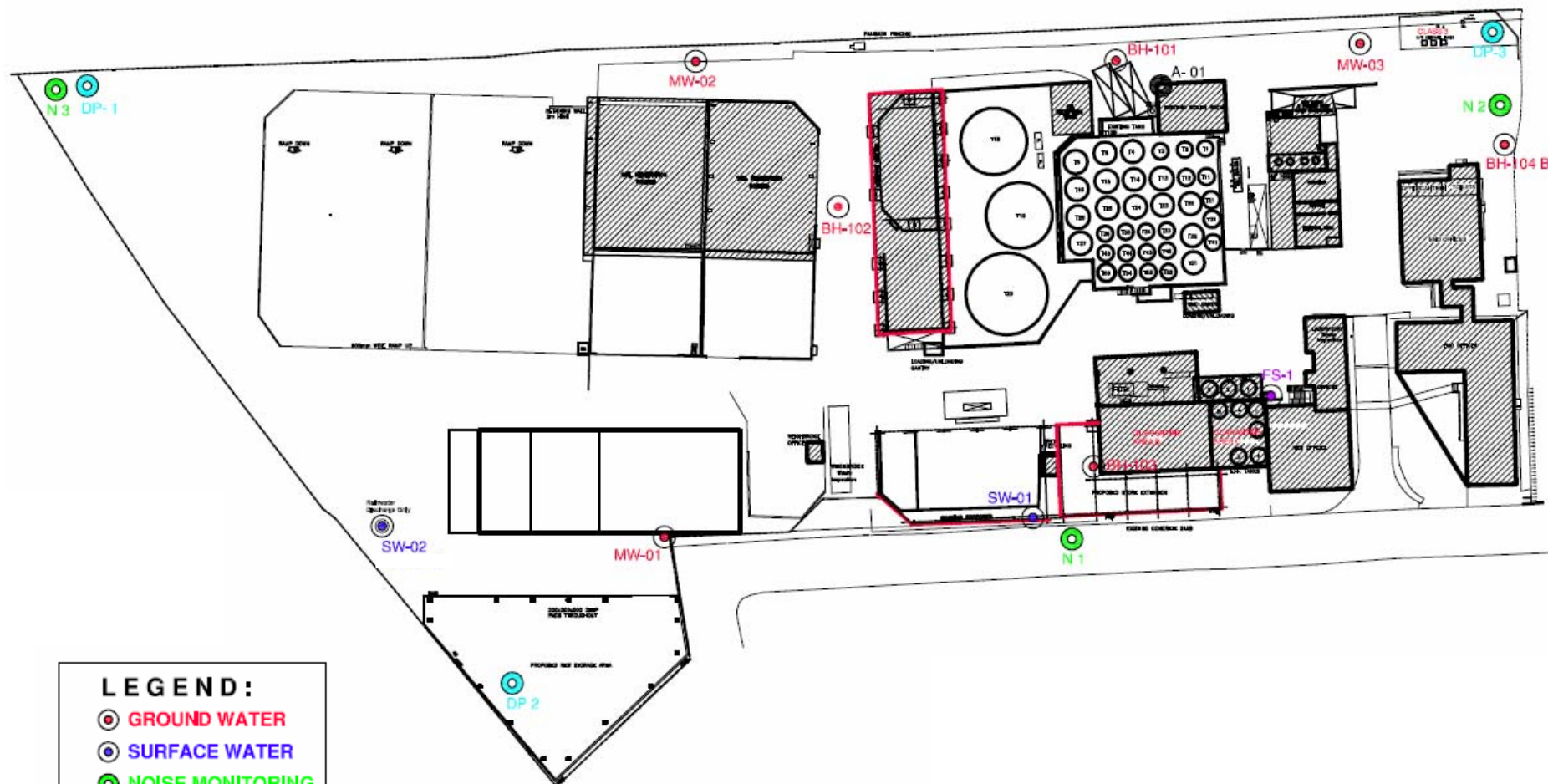


Figure 10: N 5 – Night time

Appendix 6



LEGEND:

- GROUND WATER
- SURFACE WATER
- NOISE MONITORING
- DUST MONITORING
- EFFLUENT
- AIR EMISSIONS

Appendix 7

Waste Recovery Report 2009

Enva

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ENVA WASTE RECOVERY WASTE STREAMS

1.0 INTRODUCTION

This report was carried out as per Condition 11.3 of the Enva waste management Licence and follow up correspondence received on the 15/04/2005. This report outlines the waste streams which are handled by Enva and the current methods employed to handle these wastes.

Reports consulted while compiling this report include the National Waste Report 2004, other EPA publications such as "Taking stock and Moving Forward ", proposed waste management plan 2008-2012 and other EU guidance notes on various waste streams. Enva aim to provide to our customers a fully integrated solution to waste management as our site and our sister company sites develop. The general down turn in the economy over the last 12 months has resulted in a slow down in waste collection volumes and general economic conditions.

2.0 WASTE STREAMS

2.1 WASTE OILS, OILY WATERS, OILY SLUDGES AND SOLID OILY WASTES

Enva collects a considerable volume of waste oils, oily waters and waste fuels which are accepted at the Portlaoise facility and consequently recovered into a fuel for re-use. The volume collected of waste oils and oily waters during 2009 was in the region of 21,000 tonnes .

- Lubricant oil comprises of approximately 75 % of the waste oil. This oil is collected mainly from garages and industry.
- Waste ship oils are oily waters generated from ships. The waste ship oil is collected when the ship is in port. The actual content of oil collected from these sources is approximately 25% of the total volume of waste oil

The Waste Oil Directive implemented the requirement for each member state to give priority to the regeneration of waste oil and then to combustion. The regeneration of waste lubricating oils within Ireland into re-usable oils (or base oils) is uneconomic due to the limited market size (a much greater volume would be required to sustain such a project). However under the new Waste framework Directive, the Waste oil Directive has been repealed and the priority for regeneration is no longer applicable across the EU. Enva's recovery of waste oils to a fuel represents the best environmental option for this waste stream within Ireland as supported in the National hazardous waste management plan 2008-2012.

The processing of used hydrocarbons leads to the production of a tank bottom sludge fraction in the processing tanks. This sludge comprises of grit and silt contaminated by heavy fraction hydrocarbons. This fraction is also sent for recovery into a secondary fuel.

Fractions of solid oily wastes which comprise of contaminated rags, protective clothing etc are also collected. These wastes are bulked and compacted into UN approved containers for export. These wastes are then processed into a secondary fuel for use within cement kilns and other suitable industrial processes.

2.2 SOIL TREATMENT

Since 2002 Enva have operated a contaminated soil treatment facility. This has enabled Enva to treat soils contaminated with hydrocarbon fractions on site.

Since mid 2004 it has been possible for Enva to segregate the re-usable fractions of stone from the contaminated soil and re-use it. This allows Enva to recycle an additional waste stream from the soil process. In general it is possible to extract 10-15 % of aggregate material from the processing of the soil waste stream for re-use. Previously this aggregate material would have been going to landfill. The segregation of the waste stream has also increased the efficiency with which soil can be handled on site including additional aeration while being screened and tromelled and improving the soil particle size for aeration.

Currently there is a very limited market for bioremediating soils within Ireland due to the limited outlets for bioremediated material. Bioremediated material is still largely dependent on landfill (inert or non-hazardous) for use. The majority of hydrocarbon contaminated soils available are currently exported either for direct landfill or remediation followed by reuse in landfill. Enva offer stabilisation of soil as an alternative to export for treatment as an option to customers dependent on the waste stream. Currently Enva are carrying out as much recovery as is feasible. During 2009 soil was treated on the Enva Portlaoise site and sent to landfill, no soil was exported out of the country during 2009

Enva processed 12,428 tonnes of soil in 2009 and with a target set for the recycling of up to 85% of construction and demolition waste in 2013 it is envisaged that Enva should be able to contribute to this.

2.3 USED METAL FILTERS.

Enva are currently directly exporting metal filters for recovery. This is due to the current market and limitation in outlets for recycling of this waste in Ireland. Enva accepted on site 743 tonnes of oil filters in 2009

2.4 FLUORESCENT TUBES

The hazardous waste management plan found that there were over 2267 tonnes of fluorescent tubes unaccounted for in Ireland in 2006. In the same year only 408 tonnes of fluorescent tubes were collected for recycling. Enva collected approximately 2 tonnes of spent fluorescent tubes in 2009.

2.5 BATTERIES

Currently in Ireland there is no method for recycling batteries back into a recovered metal. Waste lead acid batteries are transported to the continent by Enva where the battery is re-smelted for metal recovery. Enva currently process approximately 2500 tonnes of lead acid batteries annually for export.

By further increasing the ease of service availability to Enva's existing customer database there has been a considerable increase in the collection of batteries. In the Hazardous waste management plan 2008-12, a significant increase in the recycling of batteries has been reported with 98 % of used lead acid batteries reported to be recycled in 2006.

In 2008 the battery directive was brought into force in Ireland (S.I. 268 of 2008) which required Irish producers to set up a take back of spent batteries and accumulators free of charge with a view to recycling the raw materials for use in the manufacture of new products.

2.6 END OF LIFE VEHICLES AND TYRES

Currently Enva do not process any end of life vehicles on site. However, Enva do accept wastes on site such as batteries, oils, filters etc which are derived from ELV waste streams. Enva continue to actively pursue new recycling/recovery options for ELV derived wastes which already complement existing waste collections as mentioned above.

2.7 WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT.

It is currently not feasible for Enva to handle large volumes of WEEE. Although capable of handling these materials current market conditions mean it is not likely that Enva will be carrying out any significant storage or processing of WEEE in the near future.

2.8 NON-HAZARDOUS SLUDGE

The treatment of Waste water treatment plant sludge's by drying is currently not feasible, Enva will continue to review this as changes occur within the industry.

2.9 USED COOKING OILS

The demand for the supplementation of natural resources for alternative options has lead over the last few years to an increase in demand for the use of bio-diesels as alternative sources of energy for vehicles. Enva have promoted this through the collection and onward export of used cooking oils since 2005 for bio-diesel production. In 2008 approximately 1000 tonnes of used cooking oil was processed through the site for onward movement. However Enva have scaled back its existing collection service since mid 2008 due to market forces. 13 tonnes of used cooking oil and grease trap waste was collected in 2009

3.0 CONCLUSION

Activities on the Enva site activities have grown considerably since the granting of the waste licence early in January 2004. In 2009 37753 tonnes of hazardous waste was processed through the site.

REFERENCE MATERIAL

1. www.europa.eu.int
2. National Hazardous waste Management Plan 2008-2012
3. Waste management (batteries and accumulators) Regulations 2008 (S.I. 268 of 2008)

Appendix 8

1.0 PURPOSE

The purpose of this procedure is to ensure that environmental, health & safety information is communicated effectively to all external bodies and other parties and to ensure that environmental, health & safety concerns are effectively communicated and appropriately dealt with.

2.0 SCOPE

This procedure relates to any external environmental, health & safety communication with members of the public or with regulatory authorities or any requests for information regarding the environmental, health & safety performance of site operations within any of the Enva facilities in the Republic of Ireland.

It does not cover reporting of incidents/accidents/emergencies or training. These are dealt with under separate procedures. Customer complaints or dealing with customer requests is outside the scope of this procedure also.

3.0 RESPONSIBILITIES

It shall be the responsibility of the HSE Department to;

- Communicate environmental, health and safety information to all members of the public and regulatory authorities as necessary.
- Retain logs and records of external communications.
- Address requests for information from the public.
- Address and report complaints which relate to HSE performance.

4.0 PROCEDURE

4.1 The following documents are used to communicate environmental health and safety information to external parties

- HSE policy
- HSE manual
- EPA Annual Environmental Report
- Waste Collection Permit Reports
- DGSA report
- EPA waste licence
- Waste Collection Permits
- Contractor inductions
- External audits

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4.2. Communications with Regulatory Authorities

All communications with regulatory authorities such as the HSA, EPA, etc shall be entered into a communications log. This shall record the dates of the communication, persons involved, topic covered and close out of the communication. Copies of communications sent or received shall also be filed by the HSE Department.

4.3 Communications with other Interested External Parties

4.3.1 All enquiries regarding the environmental, health & safety performance of the site operations are to be directed to the HSE department.

4.3.2 Requests for information from the general public shall be directed to the HSE Department who shall deal with each request or enquiry as appropriate. Evna sites are required under their Waste Management licenses to maintain a file for public inspection which should as a minimum include:

- Monitoring results,
- Complaints records,
- Environmental incidents records,
- EPA communication files including audits and inspections,
- Annual Environmental Reports.

Copies of information shall only be given to the public on the authority of the Chief Operations Officer (C.O.O.) or Managing Director of Enva.

4.3.3 Any complaints relating to HSE matters (e.g. related to public safety, nuisances, environmental emissions etc) received by Enva shall be directed to the HSE department. The HSE Department shall record details of the complaint and initiate corrective action. As appropriate the complaint shall be reported to the relevant regulatory authorities (e.g. EPA/HSA). The HSE Department shall ensure an investigation takes place and shall respond (generally in writing) within one week of the complaint being received. A Corrective Action Requirement (CAR) shall be raised in relation to any complaint. . The person/ persons who have submitted the complaint shall be kept informed of any progress made in resolving the issue that gave rise to the complaint.

4.3.4 All enquiries regarding environmental, health & safety information shall be dealt with by the HSE department. Written requests shall be filed with the response attached.

4.3.5 If the request for information cannot be fulfilled over the telephone the HSE department may if appropriate invite the enquirer to the site to review any Printed documents are uncontrolled and subject to change. Please check electronic document control system for current version of this document.

appropriate documentation or records available on the public file. In such cases the C.O.O. must be notified.

- 4.3.6** All site tours associated with an enquiry should be scheduled where possible within one working week of receipt of request. In exceptional circumstances it may be arranged at shorter notice.

5.0 RELATED DOCUMENTS

Correspondence Logs
Records of complaints

6.0 REFERENCE

ISO14001:2004 Clause 4.4.3
OHSAS 18001 Clause 4.4.3

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Appendix 9

ENVA Ireland Ltd GROUP OBJECTIVES TARGETS

OBJECTIVE:				ACHIEVE BY:
GP-01-2008	Provide a high level of Emergency Preparedness on the Enva site.			31/12/2011
RATIONALE:	While there is a high level of strong HSE management throughout Enva more focus is now possible for potential emergency situations.			
TARGET:				ACHIEVE BY:
GP-01-T1	Develop Site Specific Emergency Procedures and create appropriate awareness			31/12/2008
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	All sites to review/develop an appropriate and consistent site specific emergency preparedness plan.	HSE & Operations	Completed	Emergency response plan in place.
2	Carry out training and emergency drills for all staff.	HSE & Operations	Completed	Fire drills are carried out regularly on site, Emergency test scenarios commenced. Fire officer has visited the site and recommendations put in place.
TARGET:				ACHIEVE BY:
GP-T01-2	Fire risk assessment are to be carried out for each site and all high risk areas to have fire detection/alarms and ensure appropriate segregation/compartimentalisation.			31/06/10
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Fire risk assessment to be completed.	HSE	Complete	Fire risk assessment has been carried out.
2	Install fire detectors in all area identified in relevant fire risk assessments if required.	HSE & Operations	31/06/09	Fire detectors have been put in place to cover the tank farm area. Additional fire detectors have been put in place and further upgrades are planned for 2010/11
3	Ensure waste is stored as per HSG 71 requirements	HSE & Operations	30/12/2010	
TARGET:				ACHIEVE BY:
GP-T01-3	Install spill/level alarms in all bunds greater than 50,000 litres capacity.			31/08/2009
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Identify relevant bunds greater than 100,000 lt capacity and install level alarms.	HSE & Operations	31/12/2011	A bund alarm for the main tank farm bund is in place.
2	Identify relevant bunds greater than 50,000 lt capacity and install level alarms.	HSE & Operations	31/12/2011	Currently there are none on site in the PL site

OBJECTIVE:			ACHIEVE BY:	
GP-02-2008	Increase our adherence to relevant International Standards of operation & Best Practice.			01/03/2010
RATIONALE:	To ensure Enva's activities are operated to an appropriate standard providing confidence to our customers and senior management.			
TARGET:			ACHIEVE BY:	
GP-T02-4	Operate the Portlaoise laboratory to a recognised standard.			01/03/2010
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Perform gap analysis against accreditation criteria for ISO 17025 and develop implementation programme.	HSE / LAB	31/10/2009	Gap analysis completed in July 2008. Recommendations to be implemented.
2	Consider implementation of a laboratory standard	HSE / LAB	31/03/2012	Steps have been taken by Enva PL to improve the quality of the work carried out in the laboratory as per Objective No. 6.

OBJECTIVE:				ACHIEVE BY:
GP-03-2008	Improve the management of waste arisings from both commercial and internal activities in line with the revised 5 step waste hierarchy.			30/12/2010
RATIONALE:	Improved waste management is one of the aims stated on the group HSE Policy document. Management of internal waste is highly visible to employees and can therefore help reinforce the strong environmental culture within Enva.			
TARGET:				ACHIEVE BY:
GP-T03-1	Establish the baseline of waste production and set measurable improvement targets for landfill diversion/disposal and increased recovery/recycling.			30/12/2010
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Gather baseline data on types and volumes of wastes arising from commercial and internal sources and the costs associated with these.	HSE	31/09/2008	Baseline data was gathered from September 2008 to October 2009 for all wastes arising for Enva site activities
2	Identify priority target wastes based on volume arising, cost to Enva, ease of recovery/recycling.	HSE	30/12/2008	A review was conducted of the volumes of wastes generated from Envas own activities, all wastes generated are sent for recovery where possible, there are currently no diversions from landfill to be made as all recyclable materials are taken out of the landfill waste stream for what is generated on site. All laboratory wastes are sent for recovery where possible.
3	Perform preliminary investigation into feasibility of landfill diversion / improved recovery.	HSE	30/12/2008	All wastes where possible are currently diverted from landfill.
4	Establish targets based on estimated approximate improvement achievable.	Operations	31/03/2009	No targets identified as all wastes where possible and where markets allow are diverted from landfill and recycled where possible.
5	Implement measures to achieve targets	ALL	30/12/2010	Not required.

OBJECTIVE:				ACHIEVE BY:
GP-04-2008	Ensure we are efficient in our use of energy & resource consumption.			31/03/2011
RATIONALE:	As an environmental service company we need to demonstrate good practice in this regard to our customers and also to our employees so as to assist in promoting a strong HSE conscience and culture.			
TARGET:				ACHIEVE BY:
GP-T04-1	Increase awareness towards the efficient use of resources & energy.			31/12/2010
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Develop an internal awareness campaign including erecting posters/reminders across all sites.	HSE	31/12/2008	Energy awareness posters have been put in place on site
2	Establish on each site an energy team to lead the Energy reduction programme.	HSE	31/12/2008	An energy team has been established on site.
3	Develop operations and office based initiatives relating to energy & resource use to promote efficiency culture.	Energy team	31/12/2010	Ongoing
TARGET:				ACHIEVE BY:
GP-T04-2	Identification and Assessment of Energy consumption on each Enva site.			31/03/2011
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Establish current energy sources and assess the annual spend on energy.	Energy team	30/01/2008	There was an administrative error in this target date in last years report as it should have read as 30/01/09. Energy sources used on site are currently being monitored and usage figures being collated.
2	Develop a register of energy aspects which can be used to develop an energy management programme and assess the critical users of energy	Energy team	30/06/2009	deferred.
3	Review of existing tariffs in use through out all sites.	Energy team	30/06/2009	A review of tariffs was carried out and reductions have been made in energy costs.
4	Establish Energy performance indicators applicable for use in Enva to allow for monitoring of annual consumption	Energy team	30/06/2009	In order to establish indicators and reduction figures it is important first to establish actual usage. Enva are currently in the process of putting in place meters to establish energy usage at various points around the plant. The establishment of any further reduction targets is dependant on this.
5	Establish an Energy reduction target.	Energy team	30/06/2009	This objective will be reviewed in light of current energy usage monitoring being carried out by Enva
6	Implement energy reduction measures to achieve 40% of target	Energy team	31/12/2009	This objective will be reviewed in light of current energy usage monitoring being carried out by Enva
7	Implement energy reduction measures to achieve 80% of target	Energy team	30/09/2010	This objective will be reviewed in light of current energy usage monitoring being carried out by Enva
8	Implement energy reduction measures to achieve 100% of target	Energy team	31/03/2011	This objective will be reviewed in light of current energy usage monitoring being carried out by Enva
TARGET:				ACHIEVE BY:
GP-T04-2	Identification and Reduction in water consumption			31/12/2010
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Establish the water usage for each site	Energy team	31/09/2008	Annual water usage has been established currently use 11865.06 m ³ was used in 2008
2	Establish a register of water uses on site and identify the high demand users of water.	Energy team	21/12/2008	Register of water users is currently not established this has been moved to 30/04/09 for completion
3	Develop targets for reduction in water usage	Energy team	31/03/2009	Water users on site were reviewed and found that figures being reported included usage by a neighbouring business. This metre has been isolated from the Enva supply and will allow for more realistic figures for actual enva usage. A water metre for Enva has been order to allow Enva to monitor water usage, this will allow Enva to identify if there are any potential leaks or losses of water from the system.
4	Implement water use reduction measures to achieve 50% of target	Energy team	31/12/2009	This objective will be re-viewed in light of the assessment of current resource monitoring being carried out by Enva
5	Implement water use reduction measures to achieve 100% of target	Energy team	31/12/2010	This objective will be re-viewed in light of the assessment of current resource monitoring being carried out by Enva

OBJECTIVE:				ACHIEVE BY:
GP-05-2008	Develop a positive environmental & safety competent culture within Enva			31/12/2010
RATIONALE:	A strong environmental & safety culture benefits staff, the organisation and the environment.			
TARGET:				ACHIEVE BY:
GP-05 -T01	Development of a robust training programme for Enva activities			31/12/2009
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
	Establish roles and task specific training requirements for Enva, PL personnel	HSE	21/09/2008	Training roles and tasks have been identified for Enva Portlaoise staff.
	Develop existing Logix training software to implement all identified training requirements for each department.	HSE	31/09/2008	Logix software has been put in place and all core roles within each department and the training requirements for these personnel assigned.
	Develop roles and training requirements on remaining Enva sites and populate training software.	HSE	31/12/2008	Not applicable
TARGET:				ACHIEVE BY:
GP- 05-T02	Increase the HSE awareness and participation of senior members of staff.			31/03/2010
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
	Identify HSE training requirements for Supervisors and Managers	HSE	31/03/2009	Training courses for Supervisors and Managers have been identified and courses are currently being drafted.
	Develop training for senior staff to improve competency	HSE	31/12/2010	Target date reviewed and moved forward.
	All senior members of staff to receive general HSE training	HSE	31/03/2010	Training was conducted with managers and Supervisors with regard to HSE responsibility awareness in October 2009. Further training to be carried
	All Directors to conduct two HSE site inspections per year and produce a brief report on the inspection.	Directors	31/03/2010	
TARGET:				ACHIEVE BY:
GP- 05-T03	Assessment of safety culture within Enva			31/12/2010
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
	Develop appropriate HSE KPIs to monitor the trends in HSE performance across Enva and on individual facilities.	AP,DB	31/12/2008	This Objective has been moved to the 31/12/10
	Investigate methods of good safety culture measurement	AP,DB	31/03/2010	
	Implement preferred safety culture assessment methodology to assess each Enva site.	AP,DB	31/12/2010	

OBJECTIVE:				ACHIEVE BY:
PL 06-2008	Improvement in enironmental performance and compliance.			31/12/2010
RATIONALE:	To ensure that activities from the site do not impact on the environment.			
TARGET:				ACHIEVE BY:
PL 06 T01	Improvement of the quality of effluent release from the site			31/12/2010
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
	Continue to monitor effluent and ensure parameters are met. Investigate treatment options for parameters not in compliance with the site licence.	HSE & Operations	Ongoing	Enva have identified a number of customer which generate oil which contains levels of ammonia which if not managed correctly when accepted on site can affect the effluent quality. A notification has been put on to the customer database to highlight this waste to drivers and operational staff thus ensuring that ammonia oil is handled appropriately i.e. not mixed with oils with high content of water. Trials have also been carried out by the Enva laboratory to determine the reduction of ammonia in water using sodium hypochlorite. Dosing of effluent for reduction of Ammonia has commenced and has allowed for effective reduction in Ammonia in effluent. There was one sporadic exceedance in sulphates in 2009. As this was only a one off there can be no further investigations carried out as the source is unknown.
TARGET:				ACHIEVE BY:
PL 6 T02	Investigate groundwater contamination on site.			01/09/2008
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Submit proposal to the Agency for approval.	HSE	01/05/2008	Proposal submitted to the Agency and approved
2	Put in place measures outlined in proposal	HSE & Operations	01/09/2008	Report carried out and submitted to the Agency for review- Awaiting Agency response.
TARGET:				ACHIEVE BY:
PL6 T02	Improve site infrastructure			31/12/2010
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Install Interceptor No. 3 at north end of the site	HSE & Operations	31/12/2010	Installation of the third interceptor is completed
2	Extend hardstanding area on site and install associated drainage.	HSE & Operations	31/12/2010	Installation of the hardstanding area and associated drainage is completed and viewed by Inspector
3	Repair old cracked concrete adjacent to the filter press to improve integrity of the yard.	Operations	30.09.09	Cracks have been repaired.
4	Improve site security by automating the weighbridge gate	Operations	30.09.09	Completed in June 2009
5	Put in place more robust mechanism of marking site drains with blue triangles.	Operations	30.07.09	Letter submitted to the Agency to approve the use of steel triangles for the marking of surface water drains instead of the blue markings. This has been approved by the inspector as being a more robust mechanism of marking the drainage. This system is now in place.
TARGET:				ACHIEVE BY:

PL6 T03	Improve odour emissions from the site			01/07/2008
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Submit SEW to EPA for approval	HSE	01/05/2008	Approved by Agency
2	Install odour abatement technology	HSE & Operations	01/07/2008	Odour abatement technology installed.
3	Improve preventative maintenance of odour abatement nozzles and document.	Operations	30.04.10	
TARGET:			ACHIEVE BY:	
PL6 T04	Improve segregation of hazardous and non-hazardous wastes-Removed.			01/09/2008
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS
1	Install washer unit to separate hazardous from non-hazardous waste	HSE & Operations	01/09/2008	This target is closed due to the cessation of used cooking oil collections.
PL6 T05	Gain more accurate waste weights			31/03/2010
STEP	IMPLEMENTATION PROGRAMME	RESP.	Target Date	STATUS 30/1210
1	Identify ways in which to gain more accurate stock weights on site For EPA reporting purposes.	HSE & Operations	30/06/2009	Monthly reports were carried out of waste volumes taken on site however these reports were found to be of no benefit as there was too much cross over i.e the time period was too short for monitoring. EWCs have been updated on the system to improve reportability of wastes collected.
2	Implement steps identified to ensure that stock figures are available for reporting to EPA on a quarterly and annual basis.	HSE & Operations	31/03/2011	Weights are being recorded from Jan2010 onwards onto the waste tracking system this will help improve further the quality of data recorded. A review of reports will be carried out for 2010/11 to assess further improvements. This objective has been re-set for 31/03/2011
TARGET:			ACHIEVE BY: 31/12/2011	
PL6 T06	Review quality of self monitoring compliance data		31/03/2010	
	Review of existing documented procedures to ensure that correct methodologies are being used	Laboratory &HSE	30.08.09	This has been completed, all SOPs and their methodologies have been reviewed and documented.-Complete
	Ensure that conditions of Envva licence monitoring is being performed correctly and the interpretation of the monitoring is correct	Laboratory &HSE	30.10.09	A compliance review of this condition (Condition 8) has been carried out to ensure compliance with the licence monitoring requirements.-Complete
	Ensure all personnel carrying out Laboratory duties and external personnel are trained and competent.	Laboratory &HSE	30.09.09	All Laboratory personnel carrying out activities on site are trained and competent to carry out analysis required. Relevant confirmation has been received also that external personnel who carry monitoring relevant to the licence requirements are also trained appropriately.-Complete
	Review to be carried out of quality control procedures.	Laboratory &HSE	30.09.09	This has been carried out in conjunction with the review of the SOPs. Quality checks/controls are now a part of each SOP and in turn carried out by laboratory personnel as a part of daily routine. -Complete
	Review to be carried out of methods used for their suitability and the relevant sample matrix.	Laboratory &HSE	30/12/2009	The suitability of the methods used and the suitability of the analysis for that matrix was assessed when reviewing all critical laboratory SOPs.-Complete
	Assess where required the performance characteristics for each critical laboratory method in use.	Laboratory &HSE	31/03/2012	This target has been re-set due to the underestimated volume of work this will require.
	Put in place management system for Laboratory operations as per objective No. 2	Laboratory &HSE	31/03/2011	Currently a full management system will not be put in place in the Envva Laboratory, however a GAP analysis has been completed for ISO 17025 and ISO 9001 in order to determine the changes required. It has been decided that elements of ISO 17025 will be put in place rather than the full management system but may be reviewed at a later stage. This target date has been re-set as the elements of the management system that would benefit the current activities need to be established and implemented.
	Review the requirement for maintenance of calibration standard curves for each calibration run on laboratory equipment and implement recording of relevant data.	Laboratory &HSE	30/04/2010	
	Consider participation in a sampling validation programme	Laboratory &HSE	31/12/2010	
TARGET:			ACHIEVE BY: 31/12/2010	
PL7 T07	Improve Tank & Pipeline and bund integrity assessments			
	Review the site with respect to tanks and pipelines and draft a register of current bunds, tanks and pipelines, their inclusion/exclusion (if required) in the 3 yearly bund integrity assessment	HSE & Operations	31/12/2010	
	Update site drawing with all relevant bunds, tanks and pipelines.	HSE & Operations	31/12/2010	
	Submit drawing to the Agency.	HSE & Operations	31/12/2010	

Appendix 10

Enforcement Category Summary



Organisation Name	Envia Ireland
Case Number	W0184-1

Fixed Attributes	Enforcement Category
Complexity	High
Location	Low

Enforcement Category due to Fixed Attributes	C1
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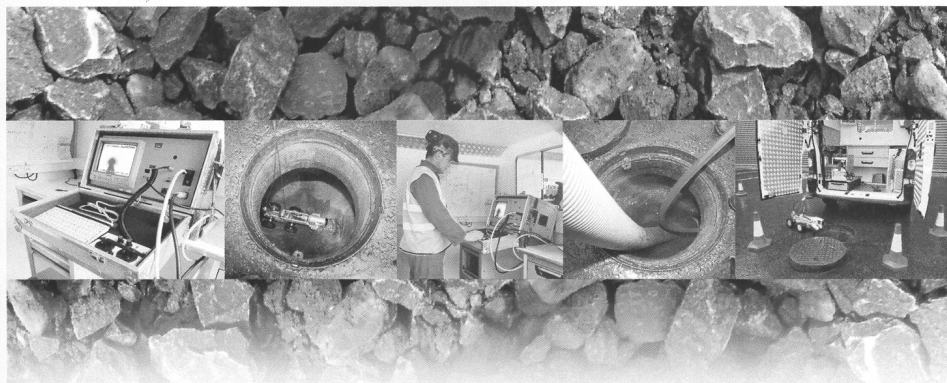
Sheet Reference	Enforcement Category
Complexity	High
Emissions	High
Location	Low
Operator Management	Mid
Enforcement Record	Low

Enforcement Category Based Upon Above 7 Attributes	A3
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FINAL ENFORCEMENT CATEGORY FOR YOUR FACILITY ¹	A1
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Note ¹: If different from above, a default may have been applied.

Appendix 11



INSPECTION REPORT

FOR

ENVA

PORTLAOISE

Ref.No.1220

21.09.2009

INCLUDED ARE: 2x DVD, 2x REPORT



ENVA


 ENVA
 Dublin 12
 IRELAND

Tel: 01 450 8111, Fax: 01 4568197

Σ Ø

 Project name:
 PORTLAOISE

 Contract number:
 1220

Contact:

 Date:
 21/09/2009

No.	start MH	end MH	Date	Road	Tape No.	Material	m	(m)
1	GULLY 1	UNKNOWN	21/09/2009	YARD	1	Polyvinyl chloride	12.9	12.9
2	GULLY 1	MAINLINE	21/09/2009	YARD	1	Polyvinyl chloride	0	0
3	GULLY 2	MH S 35	21/09/2009	YARD	1	Polyvinyl chloride	7.2	7.2
4	GULLY 2	END	21/09/2009	YARD	1	Polyvinyl chloride	7.1	7.1
5	GULLY 3	MAINLINE	21/09/2009	YARD	1	Polyvinyl chloride	8.8	8.8
6	GULLY 4	MH S 22	21/09/2009	YARD	1	Polyvinyl chloride	17.4	17.4
16	MH S 12	MH S 14	21/09/2009	YARD	1	Polyvinyl chloride	21.4	21.4
17	MH S 14	GULLY 13	21/09/2009	YARD	1	Polyvinyl chloride	2	2
25	MH S 30	GULLY 15	23/09/2009	YARD	1	Polyvinyl chloride	9.4	9.4
28	MH S 29	GULLY 16	23/09/2009	YARD	1	Polyvinyl chloride	7.9	7.9
34	MH S 6	GULLY	24/09/2009	YARD	1	Polyvinyl chloride	6.1	6.1
38	MH F 1	EMO OFFICE	25/09/2009	YARD	1	Polyvinyl chloride	7.7	7.7
39	MH F 1	EMO	25/09/2009	YARD	1	Polyvinyl chloride	21.5	21.5

Profile: 100 = 129.4 m (129.4 m)

No.	start MH	end MH	Date	Road	Tape No.	Material	m	(m)
7	GULLY 5	GULLY 6	21/09/2009	YARD	1	Polyvinyl chloride	7.8	7.8
8	GULLY 6	MAINLINE	21/09/2009	YARD	1	Polyvinyl chloride	5.5	5.5
9	GULLY 7	MAINLINE	21/09/2009	YARD	1	Polyvinyl chloride	6	6
10	GULLY 8	MAINLINE	21/09/2009	YARD	1	Polyvinyl chloride	1.6	1.6
11	GULLY 9	MH S 15	21/09/2009	YARD	1	Polyvinyl chloride	9.5	9.5
12	GULLY 11	GULLY 12	21/09/2009	YARD	1	Polyvinyl chloride	21	21
13	GULLY 11	GULLY 10	21/09/2009	YARD	1	Polyvinyl chloride	15.9	15.9
14	GULLY 10	MH S 15	21/09/2009	YARD	1	Polyvinyl chloride	9.9	9.9
15	MH S 15	MH S 12	21/09/2009	YARD	1	Polyvinyl chloride	49.4	49.4
18	MH S 12	MH S 10	21/09/2009	YARD	1	Polyvinyl chloride	6.2	6.2
19	MH S 10	MH S 9	21/09/2009	YARD	1	Polyvinyl chloride	23	23
20	MH S 9	GULLY 14	23/09/2009	YARD	1	Polyvinyl chloride	23.9	23.9
21	MH S 12	MH S 16	23/09/2009	YARD	1	Polyvinyl chloride	34.1	34.1
22	MH S 16	MH S 17	23/09/2009	YARD	1	Polyvinyl chloride	6.6	6.6
23	MH S 19	MH S 20	23/09/2009	YARD	1	Polyvinyl chloride	12.2	12.2
24	MH S 19	MH S 17	23/09/2009	YARD	1	Polyvinyl chloride	16.1	16.1
26	MH S 29	MH S 30	23/09/2009	YARD	1	Polyvinyl chloride	17.8	17.8
27	MH S 29	MH S 31	23/09/2009	YARD	1	Polyvinyl chloride	13.9	13.9
29	MH S 29	MH S 27	23/09/2009	YARD	1	Polyvinyl chloride	5.1	5.1
30	MH S 10	MH S 11	23/09/2009	YARD	1	Polyvinyl chloride	10.8	10.8
31	MH S 11	GULLY 16	23/09/2009	YARD	1	Polyvinyl chloride	2.7	2.7
32	MH S 10	GULLY 17	23/09/2009	YARD	1	Polyvinyl chloride	0.9	0.9
33	MH S 6	MH S 5	24/09/2009	YARD	1	Polyvinyl chloride	17.8	17.8
35	MH F 2	MH F 1	24/09/2009	YARD	1	Polyvinyl chloride	16.5	16.5
36	MH F 1	WELT TANK	25/09/2009	YARD	1	Polyvinyl chloride	22.4	22.4
37	MH F 1	GULLY	25/09/2009	YARD	1	Polyvinyl chloride	1.6	1.6

Profile: 150 = 358.2 m (358.2 m)

all sections = 487.6 m (487.6 m)



ENVA

ENVA
Dublin 12
IRELAND
Tel: 01 450 8111, Fax: 01 4568197**Defect Grade Description**Project name:
PORTLAOISEContract number:
1220

Contact:

Date:
21/09/2009**1:**

Occurrences without damage: for example, laterals, joints etc.

NO DEFECTS WERE DETECTED.**2:**

Constructional deficiencies or occurrences with insignificant influence to tightness, hydraulic or static pressure of pipe: f.e. wide joints, badly torched intakes, minor deformation of plastic pipes, minor erosions etc.

REHABILITATION CAN BE SCHEDULED LONG-TERM.**3:**

Constructional deficiencies diminishing static, hydraulic and tightness: f.e. open joints, untorched intakes, cracks, minor drainage obstructions such as calcide build ups, protruding laterals, minor damages to pipe wall, individual root penetrations, corroded pipe walls etc.


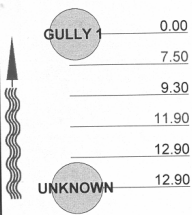


REHABILITATION IS NECESSARY MEDIUM-TERM WITHIN 3 TO 5 YEARS.**4:**

Constructional damages with nonsufficient static safety, hydraulic or tightness: f.e. axial/radial pipebursts, pipe deformations, visually noticeable infiltration/exfiltration, cavities in pipe-wall, severe protruding, laterals severe root penetrations, severe corrosion of pipe wall etc.

REHABILITATION PROCEDURE IS URGENT AND HAS TO BE COMPLETED WITHIN 1 TO 2 YEARS. NECESSITY FOR EMERGENCY OPERATIONS HAS TO BE EXAMINED.**5:**

Pipe is already or will shortly be impermeable: f.e. collapsed pipe, deeply rooted pipe or other drainage obstructions. Pipe loses water or danger of backwater in basements etc.

REHABILITATION IS URGENT AND SHORT-TERM. IN ORDER TO PREVENT FURTHER DAMAGE, NECESSARY TEMPORARY SPOT REPAIR HAS TO BE CONDUCTED ON EMERGENCY LEVEL.

ENVA																																
			ENVA Dublin 12 IRELAND Tel: 01 450 8111, Fax: 01 4568197																													
Inspection report																																
Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 1	PLR: GULLY 1 X																											
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:																											
Road: YARD	Place: PORTLAOISE	Division: 1	District: 1	start MH: GULLY 1	end MH: UNKNOWN																											
Location: Site	Tape No.: 1			Total length: 12.9 m																												
Purpose: Use: Catchment:			Size/Shape: Material: Lining: Category:																													
Surface water P1 SCHEDULE			100 Polyvinyl chloride Pipe length:																													
Comment: OBSTRUCTION DETECTED - HOLDING WATHER																																
Location details:																																
<table border="1"> <thead> <tr> <th>position</th> <th>code</th> <th>observation</th> </tr> </thead> <tbody> <tr> <td>GULLY 1 0.00</td> <td>ST</td> <td>Start of Survey</td> </tr> <tr> <td>7.50</td> <td>OB</td> <td>Obstruction, 5 % height/diameter loss</td> </tr> <tr> <td>9.30</td> <td>CU</td> <td>Camera Underwater</td> </tr> <tr> <td>11.90</td> <td>OB</td> <td>Obstruction, 50 % height/diameter loss</td> </tr> <tr> <td>12.90</td> <td></td> <td>MAINLINE</td> </tr> <tr> <td>UNKNOWN 12.90</td> <td>FH</td> <td>Finish Survey</td> </tr> </tbody> </table>				position	code	observation	GULLY 1 0.00	ST	Start of Survey	7.50	OB	Obstruction, 5 % height/diameter loss	9.30	CU	Camera Underwater	11.90	OB	Obstruction, 50 % height/diameter loss	12.90		MAINLINE	UNKNOWN 12.90	FH	Finish Survey	<table border="1"> <thead> <tr> <th>grade</th> </tr> </thead> <tbody> <tr> <td>(Misc) 0</td> </tr> <tr> <td>(Serv) 2</td> </tr> <tr> <td>(Misc) 2</td> </tr> <tr> <td>(Serv) 2</td> </tr> <tr> <td>(Misc) 0</td> </tr> </tbody> </table>		grade	(Misc) 0	(Serv) 2	(Misc) 2	(Serv) 2	(Misc) 0
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12.90		MAINLINE																														
UNKNOWN 12.90	FH	Finish Survey																														
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				 7.5 m // 00:00:00  11.9 m // 00:00:00																												
Structural Defects			Constructional Features																													
Service Defects			Miscellaneous Features																													



ENVA

ENVA
Dublin 12
IRELAND
Tel: 01 450 8111, Fax: 01 4568197

Inspection photos

Place:
PORTLAOISE

Road:
YARD

Date:
21/09/2009

section number:
1

PLR:
GULLY 1 X



Photo: 1_2a, Tape No.: 1, 00:00:00
7.5m, Obstruction, 5 % height/diameter loss



Photo: 1_4a, Tape No.: 1, 00:00:00
11.9m, Obstruction, 50 % height/diameter loss

ENVA



ENVA
Dublin 12
IRELAND
Tel: 01 450 8111, Fax: 01 4568197

Inspection report








Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 2	PLR: GULLY 1 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:





Road: YARD	Division: 1	start MH: GULLY 1
Place: PORTLAOISE	District: 1	end MH: MAINLINE
Location: Site	Tape No.: 1	Total length: 0 m
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:
Comment:	HOLDING WATER	100 Polyvinyl chloride Pipe length:
Location details:		

position	code	observation	grade
GULLY 1	0.00	ST Start of Survey	(Misc) 0
	0.00	CU Camera Underwater	(Misc) 2
	0.00	SA Survey abandoned	(Misc) 0
MAINLINE	0.00	FH Finish Survey	(Misc) 0

Structural Defects
Service Defects

Constructional Features
Miscellaneous Features

		ENVA ENVA Dublin 12 IRELAND Tel: 01 450 8111, Fax: 01 4568197																																						
Inspection report																																								
Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 3	PLR: MH S 35 X																																			
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:																																			
Road: YARD	Division: 1	start MH: GULLY 2																																						
Place: PORTLAOISE	District: 1	end MH: MH S 35																																						
Location: Site	Tape No.: 1	Total length: 7.2 m																																						
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:	100 Polyvinyl chloride Pipe length:																																					
Comment: HOLDING WATER																																								
Location details:																																								
<table border="1"> <thead> <tr> <th></th> <th>position</th> <th>code</th> <th>observation</th> <th>grade</th> </tr> </thead> <tbody> <tr> <td rowspan="4">  </td> <td>0.00</td> <td>ST</td> <td>Start of Survey</td> <td>(Misc) 0</td> </tr> <tr> <td>0.00</td> <td>WL</td> <td>Water level, 20 % height/diameter</td> <td>(Serv) 0</td> </tr> <tr> <td>1.40</td> <td>CN</td> <td>Connection, at 09 o'clock, dia 100 mm TO GULLY 1</td> <td>(Constr) 0</td> </tr> <tr> <td>1.70</td> <td>WL</td> <td>Water level, 0 % height/diameter</td> <td>(Serv) 0</td> </tr> <tr> <td rowspan="3">  </td> <td>7.20</td> <td></td> <td>MH S 35</td> <td></td> </tr> <tr> <td>7.20</td> <td>FH</td> <td>Finish Survey</td> <td>(Misc) 0</td> </tr> <tr> <td colspan="4"></td> </tr> </tbody> </table>							position	code	observation	grade		0.00	ST	Start of Survey	(Misc) 0	0.00	WL	Water level, 20 % height/diameter	(Serv) 0	1.40	CN	Connection, at 09 o'clock, dia 100 mm TO GULLY 1	(Constr) 0	1.70	WL	Water level, 0 % height/diameter	(Serv) 0		7.20		MH S 35		7.20	FH	Finish Survey	(Misc) 0				
	position	code	observation	grade																																				
	0.00	ST	Start of Survey	(Misc) 0																																				
	0.00	WL	Water level, 20 % height/diameter	(Serv) 0																																				
	1.40	CN	Connection, at 09 o'clock, dia 100 mm TO GULLY 1	(Constr) 0																																				
	1.70	WL	Water level, 0 % height/diameter	(Serv) 0																																				
	7.20		MH S 35																																					
	7.20	FH	Finish Survey	(Misc) 0																																				
Structural Defects			Constructional Features																																					
Service Defects			Miscellaneous Features																																					

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Inspection report																							
Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 4	PLR: END X																		
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:																		
Road: YARD	Place: PORTLAOISE	Location: Site	Division: 1 District: 1 Tape No.: 1	start MH: GULLY 2 end MH: END Total length: 7.1 m																			
Purpose: Use: Catchment:	Surface water P1 SCHEDULE		Size/Shape: Material: Lining: Category:	100 Polyvinyl chloride Pipe length:																			
Comment: NO DEFECTS DETECTED																							
Location details:																							
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	position	code	observation	grade																			
	0.00	ST	Start of Survey	(Misc) 0																			
	7.10		END																				
	7.10	FH	Finish Survey	(Misc) 0																			
Structural Defects			Constructional Features																				
Service Defects			Miscellaneous Features																				

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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 5	PLR: GULLY 3 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: GULLY 3
Place: PORTLAOISE	District: 1	end MH: MAINLINE
Location: Site	Tape No.: 1	Total length: 8.8 m
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:
Comment:	HOLDING WATER	100 Polyvinyl chloride Pipe length:
Location details:		

position	code	observation	grade
----------	------	-------------	-------

	0.00	ST Start of Survey	(Misc) 0
	7.80	CU Camera Underwater	(Misc) 2
	8.80	SA Survey abandoned	(Misc) 0
8.80	FH Finish Survey	(Misc) 0	

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

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Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 6	PLR: GULLY 4 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

position	code	observation	grade
GULLY 4	ST	Start of Survey	(Misc) 0
		MH S 22	
MH S 22	FH	Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 7	PLR: GULLY 5 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: GULLY 5
Place: PORTLAOISE	District: 1	end MH: GULLY 6
Location: Site	Tape No.: 1	Total length: 7.8 m
Purpose:	Size/Shape: 150	
Use: Surface water	Material: Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining:	
	Category:	
Comment: NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
----------	------	-------------	-------

GULLY 5	0.00	ST Start of Survey	(Misc) 0
	7.80	MAINLINE	
GULLY 6	7.80	FH Finish Survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features



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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 8	PLR: GULLY 6 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: GULLY 6
Place: PORTLAOISE	District: 1	end MH: MAINLINE
Location: Site	Tape No.: 1	Total length: 5.5 m
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:

Comment: Location details:	HOLDING WATER
-------------------------------	---------------

position	code	observation	grade
GULLY 6	0.00	ST Start of Survey	(Misc) 0
	1.60	CN Connection, at 03 o'clock, dia 150 mm	(Constr) 0
	2.40	CN Connection, at 09 o'clock, dia 150 mm	(Constr) 0
	3.10	CU Camera Underwater	(Misc) 2
	5.50	SA Survey abandoned	(Misc) 0
MAINLINE	5.50	FH Finish Survey	(Misc) 0
Structural Defects			
Constructional Features			
Service Defects			
Miscellaneous Features			



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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 9	PLR: GULLY 7 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: GULLY 7
Place: PORTLAOISE	District: 1	end MH: MAINLINE
Location: Site	Tape No.: 1	Total length: 6 m
Purpose:	Size/Shape: 150	
Use: Surface water	Material: Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining:	
	Category:	
Comment: NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
GULLY 7	0.00	ST Start of Survey	(Misc) 0
	6.00	MAINLINE	
MAINLINE	6.00	FH Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 10	PLR: GULLY 8 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: GULLY 8
Place: PORTLAOISE	District: 1	end MH: MAINLINE
Location: Site	Tape No.: 1	Total length: 1.6 m
Purpose:	Size/Shape: 150	
Use: Surface water	Material: Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining:	
	Category:	
Comment: NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
GULLY 8	0.00	ST Start of Survey	(Misc) 0
	1.60	MAINLINE	
MAINLINE	1.60	FH Finish Survey	(Misc) 0

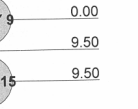
Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 11	PLR: GULLY 9 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaved: Yes	Grade:

<div> <div> Road: YARD </div> <div> Place: PORTLAOISE </div> <div> Location: Site </div> </div>	<div> <div> Division: 1 </div> <div> District: 1 </div> <div> Tape No.: 1 </div> </div>	<div> <div> start MH: GULLY 9 </div> <div> end MH: MH S 15 </div> <div> Total length: 9.5 m </div> </div>
---	---	---

Location:	Site	Pipe No.:	Size/Shape:	150
Purpose:	Surface water		Material:	Polyvinyl chloride
Use:			Lining:	Pipe length:
Catchment:	P1 SCHEDULE		Category:	

Catchment:	PT SCHEDULE	Category:
Comment:	NO DEFECTS DETECTED	
Location details:		

Location Details:			grade
position	code	observation	
	ST	Start of Survey	(Misc) 0
		MH S 15	
	FH	Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 12	PLR: GULLY 12 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: GULLY 11
Place: PORTLAOISE	District: 1	end MH: GULLY 12
Location: Site	Tape No.: 1	Total length: 21 m
Purpose:	Size/Shape: 150	
Use: Surface water	Material: Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining:	
	Category:	
Comment: HOLDING WATER		
Location details:		

	position	code	observation	grade
	GULLY 11	0.00	ST Start of Survey	(Misc) 0
		6.10	CU Camera Underwater	(Misc) 2
		16.10	WL Water level, 0 % height/diameter	(Serv) 0
		18.80	LL Line of Sewer deviates left	(Serv) 0
		20.80	CU Camera Underwater	(Misc) 2
		21.00	GULLY 12	
	GULLY 12	21.00	FH Finish Survey	(Misc) 0
Structural Defects			Constructional Features	
Service Defects			Miscellaneous Features	

Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 13	PLR: GULLY 11 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road:	YARD	Division:	1	start MH:	GULLY 11
Place:	PORTLAOISE	District:	1	end MH:	GULLY 10
Location:	Site	Tape No.:	1	Total length:	15.9 m
Purpose:				Size/Shape:	150
Use:	Surface water			Material:	Polyvinyl chloride
Catchment:	P1 SCHEDULE			Lining:	Pipe length:
				Category:	
Comment:	HOLDING WATER				
Location details:					

position	code	observation	grade
GULLY 11	ST	Start of Survey	(Misc) 0
	CU	Camera Underwater	(Misc) 2
		GULLY 10	
GULLY 10	FH	Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 14	PLR: GULLY 10 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: GULLY 10
Place: PORTLAOISE	District: 1	end MH: MH S 15
Location: Site	Tape No.: 1	Total length: 9.9 m
Purpose:	Size/Shape: 150	
Use: Surface water	Material: Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining:	
	Category:	
Comment: HOLDING WATER		
Location details:		

	position	code	observation	grade
	0.00	ST	Start of Survey	(Misc) 0
	1.00	CU	Camera Underwater	(Misc) 2
	4.70	WL	Water level, 0 % height/diameter	(Serv) 0
	9.90		MH S 15	
	9.90	FH	Finish Survey	(Misc) 0
Structural Defects	Constructional Features			
Service Defects	Miscellaneous Features			

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Inspection report																																													
Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 15	PLR: MH S 15 X																																								
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:																																								
Road: YARD	Place: PORTLAOISE	Location: Site	Division: 1	District: 1	Tape No.: 1																																								
start MH: MH S 15 end MH: MH S 12 Total length: 49.4 m																																													
Purpose: Use: Surface water Catchment: P1 SCHEDULE			Size/Shape: 150 Material: Polyvinyl chloride Lining: Pipe length: Category:																																										
Comment: NO DEFECTS DETECTED																																													
Location details:																																													
<table border="1"> <thead> <tr> <th></th> <th>position</th> <th>code</th> <th>observation</th> <th>grade</th> </tr> </thead> <tbody> <tr> <td rowspan="6">  </td> <td>0.70</td> <td>ST</td> <td>Start of Survey</td> <td>(Misc) 0</td> </tr> <tr> <td>9.00</td> <td>CN</td> <td>Connection, at 03 o'clock, dia 150 mm</td> <td>(Constr) 0</td> </tr> <tr> <td>16.50</td> <td>CN</td> <td>Connection, at 03 o'clock, dia 150 mm</td> <td>(Constr) 0</td> </tr> <tr> <td>27.80</td> <td>CN</td> <td>Connection, at 03 o'clock, dia 150 mm</td> <td>(Constr) 0</td> </tr> <tr> <td>36.10</td> <td>CN</td> <td>Connection, at 03 o'clock, dia 150 mm</td> <td>(Constr) 0</td> </tr> <tr> <td>46.40</td> <td>CN</td> <td>Connection, at 03 o'clock, dia 150 mm</td> <td>(Constr) 0</td> </tr> <tr> <td></td> <td>49.40</td> <td></td> <td>MH S 12</td> <td></td> </tr> <tr> <td></td> <td>49.40</td> <td>FH</td> <td>Finish Survey</td> <td>(Misc) 0</td> </tr> </tbody> </table>							position	code	observation	grade		0.70	ST	Start of Survey	(Misc) 0	9.00	CN	Connection, at 03 o'clock, dia 150 mm	(Constr) 0	16.50	CN	Connection, at 03 o'clock, dia 150 mm	(Constr) 0	27.80	CN	Connection, at 03 o'clock, dia 150 mm	(Constr) 0	36.10	CN	Connection, at 03 o'clock, dia 150 mm	(Constr) 0	46.40	CN	Connection, at 03 o'clock, dia 150 mm	(Constr) 0		49.40		MH S 12			49.40	FH	Finish Survey	(Misc) 0
	position	code	observation	grade																																									
	0.70	ST	Start of Survey	(Misc) 0																																									
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	49.40		MH S 12																																										
	49.40	FH	Finish Survey	(Misc) 0																																									
Structural Defects			Constructional Features																																										
Service Defects			Miscellaneous Features																																										

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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 14	PLR: GULLY 10 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: GULLY 10
Place: PORTLAOISE	District: 1	end MH: MH S 15
Location: Site	Tape No.: 1	Total length: 9.9 m
Purpose:	Size/Shape: 150	
Use: Surface water	Material: Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining:	
	Category:	
Comment: HOLDING WATER		
Location details:		

position	code	observation	grade
GULLY 10	0.00	ST Start of Survey	(Misc) 0
	1.00	CU Camera Underwater	(Misc) 2
	4.70	WL Water level, 0 % height/diameter	(Serv) 0
	9.90	MH S 15	
MH S 15	9.90	FH Finish Survey	(Misc) 0
Structural Defects			
Constructional Features			
Service Defects			
Miscellaneous Features			

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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 15	PLR: MH S 15 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 15
Place: PORTLAOISE	District: 1	end MH: MH S 12
Location: Site	Tape No.: 1	Total length: 49.4 m
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:
Comment: NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
MH S 15	0.70	ST Start of Survey	(Misc) 0
	9.00	CN Connection, at 03 o'clock, dia 150 mm	(Constr) 0
	16.50	CN Connection, at 03 o'clock, dia 150 mm	(Constr) 0
	27.80	CN Connection, at 03 o'clock, dia 150 mm	(Constr) 0
	36.10	CN Connection, at 03 o'clock, dia 150 mm	(Constr) 0
	46.40	CN Connection, at 03 o'clock, dia 150 mm	(Constr) 0
	49.40	MH S 12	
MH S 12	49.40	FH Finish Survey	(Misc) 0

Structural Defects
Service Defects

Constructional Features
Miscellaneous Features

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 16	PLR: MHS 14 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road:	YARD	Division:	1	start MH:	MH S 12
Place:	PORTLAOISE	District:	1	end MH:	MH S 14
Location:	Site	Tape No.:	1	Total length:	21.4 m

Purpose:		Size/Shape:	100
Use:	Surface water	Material:	Polyvinyl chloride Pipe length:
Catchment:	P1 SCHEDULE	Lining:	
		Category:	

Comment:	HOLDING WATER
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Location details:

position	code	observation	grade
MH S 12	ST	Start of Survey	(Misc) 0
	CU	Camera Underwater	(Misc) 2
	WL	Water level, 0 % height/diameter	(Serv) 0
		MH S 14	
MH S 14	FH	Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 17	PLR: GULLY 13 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 14
Place: PORTLAOISE	District: 1	end MH: GULLY 13
Location: Site	Tape No.: 1	Total length: 2 m

Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:	100 Polyvinyl chloride Pipe length:
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Comment:	NO DEFECTS DETECTED
Location details:	

position	code	observation	grade
MH S 14	0.00	ST Start of Survey	(Misc) 0
	2.00	GULLY 13	
GULLY 13	2.00	FH Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 18	PLR: MH S 10 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road:	YARD	Division:	1	start MH:	MH S 12
Place:	PORTLAOISE	District:	1	end MH:	MH S 10
Location:	Site	Tape No.:	1	Total length:	6.2 m

Purpose:		Size/Shape:	150
Use:	Surface water	Material:	Polyvinyl chloride Pipe length:
Catchment:	P1 SCHEDULE	Lining:	
		Category:	

Comment:	NO DEFECTS DETECTED
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Location details:

position	code	observation	grade
MH S 12	ST	Start of Survey	(Misc) 0
		MH S 10	
MH S 10	FH	Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection report

Date: 21/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 19	PLR: MH S 9 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 10
Place: PORTLAOISE	District: 1	end MH: MH S 9
Location: Site	Tape No.: 1	Total length: 23 m
Purpose:	Size/Shape: 150	
Use: Surface water	Material: Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining:	
	Category:	

Comment: **NO DEFECTS DETECTED**

Location details:

position	code	observation	grade
	ST	Start of Survey	(Misc) 0
		MH S 9	
	FH	Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection report

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 20	PLR: GULLY 14 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 9
Place: PORTLAOISE	District: 1	end MH: GULLY 14
Location: Site	Tape No.: 1	Total length: 23.9 m
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:
150 Polyvinyl chloride Pipe length:		
Comment: NO DEFECTS DETECTED		
Location details:		

	position	code	observation	grade
	0.70	ST	Start of Survey	(Misc) 0
	3.80	CN	Connection, at 02 o'clock, dia 100 mm	(Constr) 0
	10.80	CN	Connection, at 02 o'clock, dia 100 mm	(Constr) 0
	19.30		MH (BURIED)	
	22.40	PC	Pipe lengths change. New Pipe Length 100 mm	(Misc) 0
	23.90		GULLY 14	
	23.90	FH	Finish Survey	(Misc) 0

Structural Defects
Service Defects

Constructional Features
Miscellaneous Features

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 21	PLR: MH S 12 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road:	YARD	Division:	1	start MH:	MH S 12
Place:	PORTLAOISE	District:	1	end MH:	MH S 16
Location:	Site	Tape No.:	1	Total length:	34.1 m
Purpose:		Size/Shape:	150		
Use:	Surface water	Material:	Polyvinyl chloride	Pipe length:	
Catchment:	P1 SCHEDULE	Lining:			
		Category:			
Comment:	NO DEFECTS DETECTED				
Location details:					

position	code	observation	grade
MH S 12	ST	Start of Survey	(Misc) 0
0.70	CN	Connection, at 09 o'clock, dia 150 mm	(Constr) 0
19.30	MH S 16		
34.10	FH	Finish Survey	(Misc) 0
34.10			
MH S 16			

Structural Defects

Service Defects

Constructional Features

Miscellaneous Features

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Inspection report

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 22	PLR: MH S 16 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 16
Place: PORTLAOISE	District: 1	end MH: MH S 17
Location: Site	Tape No.: 1	Total length: 6.6 m
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:
NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
MH S 16	0.70	ST Start of Survey	(Misc) 0
	2.70	LR Line of Sewer deviates right	(Serv) 0
	6.60	MH S 17	
MH S 17	6.60	FH Finish Survey	(Misc) 0
Structural Defects			
Constructional Features			
Service Defects			
Miscellaneous Features			

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Inspection report

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 23	PLR: MH S 20 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 19
Place: PORTLAOISE	District: 1	end MH: MH S 20
Location: Site	Tape No.: 1	Total length: 12.2 m
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:
NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
MH S 19	0.70	ST Start of Survey	(Misc) 0
	12.20	STOPEND	
MH S 20	12.20	FH Finish Survey	(Misc) 0

Structural Defects

Constructional Features

Service Defects

Miscellaneous Features

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Inspection report

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 24	PLR: MH S 19 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 19
Place: PORTLAOISE	District: 1	end MH: MH S 17
Location: Site	Tape No.: 1	Total length: 16.1 m
Purpose:	Size/Shape: 150	
Use: Surface water	Material: Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining:	
	Category:	
Comment: NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
MH S 19	0.70	ST Start of Survey	(Misc) 0
	16.10	MH S 17	
MH S 17	16.10	FH Finish Survey	(Misc) 0
<div> <div> <div></div> <div></div> </div> </div>			
Structural Defects		Constructional Features	
Service Defects		Miscellaneous Features	

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Inspection report

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 25	PLR: GULLY 15 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 30
Place: PORTLAOISE	District: 1	end MH: GULLY 15
Location: Site	Tape No.: 1	Total length: 9.4 m
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:
Comment: NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
MH S 30	0.00	ST Start of Survey	(Misc) 0
	9.40	GULLY 15	
GULLY 15	9.40	FH Finish Survey	(Misc) 0
<div> <div> <div></div> <div></div> </div> </div>			
Structural Defects		Constructional Features	
Service Defects		Miscellaneous Features	



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Inspection report

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 26	PLR: MH S 30 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 29
Place: PORTLAOISE	District: 1	end MH: MH S 30
Location: Site	Tape No.: 1	Total length: 17.8 m

Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:	150 Polyvinyl chloride Pipe length:
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Comment: NO DEFECTS DETECTED

Location details:

position	code	observation	grade
MH S 29	0.70	ST Start of Survey	(Misc) 0
	17.80	MH S 30	
MH S 30	17.80	FH Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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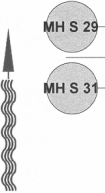


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Inspection report

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 27	PLR: MH S 31 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 29
Place: PORTLAOISE	District: 1	end MH: MH S 31
Location: Site	Tape No.: 1	Total length: 13.9 m
Purpose:	Size/Shape: 150	
Use: Surface water	Material: Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining:	
	Category:	
Comment: NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
	0.70	ST Start of Survey	(Misc) 0
	13.90	MH S 31	
	13.90	FH Finish Survey	(Misc) 0
<div> <div>Structural Defects</div> <div>Service Defects</div> </div> <div> <div>Constructional Features</div> <div>Miscellaneous Features</div> </div>			

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Inspection report

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 28	PLR: GULLY 16 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road:	YARD	Division:	1	start MH:	MH S 29
Place:	PORTLAOISE	District:	1	end MH:	GULLY 16
Location:	Site	Tape No.:	1	Total length:	7.9 m
Purpose:	Surface water P1 SCHEDULE			Size/Shape:	100
Use:				Material:	Polyvinyl chloride
Catchment:				Lining:	Pipe length:
		Category:			
Comment:	NO DEFECTS DETECTED				
Location details:					

position	code	observation	grade
MH S 29	0.00	ST Start of Survey	(Misc) 0
	7.90	GULLY 16	
GULLY 16	7.90	FH Finish Survey	(Misc) 0
<div> </div>			
Structural Defects		Constructional Features	
Service Defects		Miscellaneous Features	

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 29	PLR: MH S 29 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road:	YARD	Division:	1	start MH:	MH S 29
Place:	PORTLAOISE	District:	1	end MH:	MH S 27
Location:	Site	Tape No.:	1	Total length:	5.1 m
Purpose:		Size/Shape:	150		
Use:	Surface water	Material:	Polyvinyl chloride	Pipe length:	
Catchment:	P1 SCHEDULE	Lining:			
		Category:			
Comment:	NO DEFECTS DETECTED				
Location details:					

position	code	observation	grade
MH S 29	0.70	ST Start of Survey	(Misc) 0
	5.10	MH S 27	
MH S 27	5.10	FH Finish Survey	(Misc) 0



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Inspection report

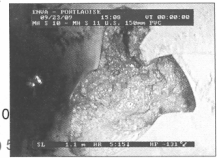
Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 30	PLR: MH S 11 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 10
Place: PORTLAOISE	District: 1	end MH: MH S 11
Location: Site	Tape No.: 1	Total length: 10.8 m

Purpose: Use: Catchment:	YARD Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:	150 Polyvinyl chloride Pipe length:
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Comment: Location details:	STRUCTURAL DEFECTS DETECTED
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position	code	observation	grade
MH S 10	0.70	ST Start of Survey	(Misc) 0
	1.00	X Collapsed Pipe, 25 % cross-sectional area loss, from 12 to 04 o'clock	(Struct) 5
	10.80	MH S 11	
MH S 11	10.80	FH Finish Survey	(Misc) 0



Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection photos

Place: PORTLAOISE	Road: YARD	Date: 23/09/2009	section number: 30	PLR: MH S 11 X
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Photo: 30_2a, Tape No.: 1, 00:00:00
1m, Collapsed Pipe, 25 % cross-sectional area loss, from 12
to 04 o'clock

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Inspection report

Date: 23/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 31	PLR: GULLY 16 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 11
Place: PORTLAOISE	District: 1	end MH: GULLY 16
Location: Site	Tape No.: 1	Total length: 2.7 m
Purpose: Use: Catchment:	YARD Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:
Comment: NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
MH S 11	0.70	ST Start of Survey	(Misc) 0
	2.40	CN Connection, at 09 o'clock, dia 150 mm	(Constr) 0
	2.70	CONNECTION TO GULLIES	
GULLY 16	2.70	FH Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

position	code	observation	grade
MH S 10	ST	Start of Survey	(Misc) 0
GULLY 17	FH	Finish Survey	(Misc) 0

Structural Defects

Service Defects

Constructional Features

Miscellaneous Features

Inspection report

Road:	YARD	Division:	1	start MH:	MH S 6
Place:	PORTLAOISE	District:	1	end MH:	MH S 5
Location:	Site	Tape No.:	1	Total length:	17.8 m

Category:	
Comment:	NO DEFECTS DETECTED

Location details:

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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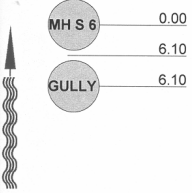
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Inspection report

Date: 24/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 34	PLR: GULLY X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH S 6
Place: PORTLAOISE	District: 1	end MH: GULLY
Location: Site	Tape No.: 1	Total length: 6.1 m
Purpose: Use: Catchment:	Surface water P1 SCHEDULE	Size/Shape: Material: Lining: Category:
Comment: NO DEFECTS DETECTED		
Location details:		

position	code	observation	grade
	0.00	ST Start of Survey	(Misc) 0
	6.10	GULLY	
	6.10	FH Finish Survey	(Misc) 0
Structural Defects			
Service Defects			
Constructional Features			
Miscellaneous Features			

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Inspection report

Date: 24/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 35	PLR: MH F 1 X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH F 2
Place: PORTLAOISE	District: 1	end MH: MH F 1
Location: Site	Tape No.: 1	Total length: 16.5 m
Purpose: Use: Foul	Size/Shape: Material: 150 Polyvinyl chloride	Pipe length:
Catchment: P1 SCHEDULE	Lining: Category:	
Comment: NO DEFECTS DETECTED		
Location details:		

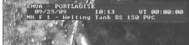
	position	code	observation	grade		
	MH F 2	0.70	ST	Start of Survey	(Misc) 0	
		8.60	LL	Line of Sewer deviates left	(Serv) 0	
		16.50		MH F 1		
	MH F 1	16.50	FH	Finish Survey	(Misc) 0	

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

Date: 25/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 36	PLR: WELT TANK X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Comment:	OBSTRUCTION DETECTED
Location details:	

position	code	observation	grade
MH F 1	ST	Start of Survey	(Misc) 0
16.30	OB	Obstruction, 5 % height/diameter loss	(Serv) 2
22.40		WELTING TANK	
22.40	FH	Finish Survey	(Misc) 0



16.3 m // 00:00:00

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection photos

Place: PORTLAOISE	Road: YARD	Date: 25/09/2009	section number: 36	PLR: WELT TANK X
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Photo: 36_2a, Tape No.: 1, 00:00:00
16.3m, Obstruction, 5 % height/diameter loss

Date: 25/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 37	PLR: GULLY X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road:	YARD	Division:	1	start MH:	MH F 1
Place:	PORTLAOISE	District:	1	end MH:	GULLY
Location:	Site	Tape No.:	1	Total length:	1.6 m

Purpose:		Size/Shape:	150
Use:	Foul	Material:	Polyvinyl chloride Pipe length:
Catchment:	P1 SCHEDULE	Lining:	
		Category:	

Comment:	NO DEFECTS DETECTED
Location details:	

position	code	observation	grade
MH F 1	ST	Start of Survey	(Misc) 0
		GULLY	
GULLY	FH	Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

position	code	observation	grade
MH F 1	0.00	ST Start of Survey	(Misc) 0
	0.00	CU Camera Underwater	(Misc) 2
	7.70	SA Survey abandoned	(Misc) 0
EMO OFFICE	7.70	FH Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features



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Inspection report

Date: 25/09/2009	Job N°: 1220	Weather: Dry	Operator: Martin	section number: 39	PLR: EMO X
Present:	Vehicle: Ford Transit	Camera: RICO MM/DD/YY	Preset:	Cleaned: Yes	Grade:

Road: YARD	Division: 1	start MH: MH F 1
Place: PORTLAOISE	District: 1	end MH: EMO
Location: Site	Tape No.: 1	Total length: 21.5 m

Purpose:	Size/Shape: 100
Use: Foul	Material: Polyvinyl chloride Pipe length:
Catchment: P1 SCHEDULE	Lining:
	Category:

Comment: HOLDING WATER
Location details:

position	code	observation	grade
MH F 1	0.00	ST Start of Survey	(Misc) 0
	9.80	CU Camera Underwater	(Misc) 2
	11.90	WL Water level, 0 % height/diameter	(Serv) 0
	21.50	AJ	
EMO	21.50	FH Finish Survey	(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

Appendix 12

CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	193001
Customer Instrument ID	V12 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23rd July 2009	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.2	- 0.2	- 0.2
25.0	24.7	24.7	- 0.3
50.0	49.8	49.8	- 0.2
75.0	74.9	74.9	- 0.1
100.0	99.8	99.8	- 0.2
150.0	150.2	150.2	+ 0.2

Instrument Calibration Results

75.0	75.1	75.1	+ 0.1
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Comment: High Level Sounder Alarm & SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By:		Date	23/7/09	Accepted By:	
Signature				Signature	Date

SCADA IRELAND LTD

Valentia Place, Newcastle, Co Down
 Tel: 028 43725970 Fax: 028 43725846 email: scadaireland@aolcom

CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	193001
Customer Instrument ID	V13 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 2009	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.4	- 0.4	- 0.4
25.0	24.7	24.7	- 0.3
50.0	49.7	49.7	- 0.3
75.0	74.8	74.8	- 0.2
100.0	99.7	99.7	- 0.3
150.0	149.8	149.8	- 0.2

Instrument Calibration Results

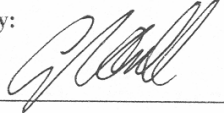
75.0	75.1	75.1	+ 0.1
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Comment: High Level Sounder Alarm & SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

Valentia Place, Newcastle, Co Down

Tel: 028 43725970 Fax: 028 43725846 email: scadaireland@aolcom

CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	I93001
Customer Instrument ID	V11 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23rd July 2009	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.4	- 0.4	- 0.4
25.0	24.7	24.7	- 0.3
50.0	49.6	49.6	- 0.4
75.0	74.7	74.7	- 0.3
100.0	99.6	99.6	- 0.4
150.0	149.6	149.6	- 0.4

Instrument Calibration Results

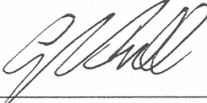
75.0	75.0	75.0	0
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Comment: High Level Sounder Alarm & SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7943

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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Valentia Place, Newcastle, Co Down

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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	I93001
Customer Instrument ID	V14 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	24 th July 2009	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.2	- 0.2	- 0.2
25.0	24.8	24.8	- 0.2
50.0	49.8	49.8	- 0.2
75.0	75.0	75.0	0
100.0	100.0	100.0	0
150.0	149.9	149.9	- 0.1

Instrument Calibration Results

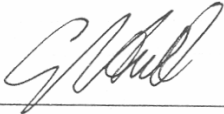
75.0	75.1	75.1	+ 0.1
------	------	------	-------

*Comment: High Level Sounder Alarm & SCADA screen Alarm found working OK
PT100 Pocket found leaking, calibration only possible with tank empty*

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	24/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

Valentia Place, Newcastle, Co Down

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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	193001
Customer Instrument ID	V15 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or - 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.2	- 0.2	- 0.2
25.0	24.8	24.8	- 0.2
50.0	49.9	49.9	- 0.1
75.0	74.9	74.9	- 0.1
100.0	99.9	99.9	- 0.1
150.0	150.0	150.0	0

Instrument Calibration Results

75.0	75.3	75.3	+ 0.3
------	------	------	-------

Comment: High Level Sounder Alarm & SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	I93001
Customer Instrument ID	V16 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.1	- 0.1	- 0.1
25.0	24.9	24.9	- 0.1
50.0	49.9	49.9	- 0.1
75.0	75.1	75.1	- 0.1
100.0	100.0	100.0	0
150.0	150.0	150.0	0

Instrument Calibration Results

75.0	75.3	75.3	+ 0.3
------	------	------	-------

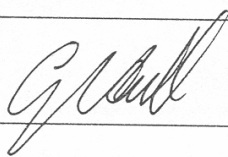
Comment: High level sounder and SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By:
Signature



Date

23/7/09

Accepted By:
Signature

Date

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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	I93001
Customer Instrument ID	V26 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.2	- 0.2	- 0.2
25.0	25.0	25.0	0
50.0	50.0	50.0	0
75.0	75.2	75.2	+ 0.2
100.0	100.2	100.2	+ 0.2
150.0	150.2	150.2	+ 0.2

Instrument Calibration Results

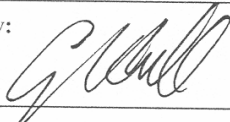
75.0	75.2	75.2	+ 0.2
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Comment: Found PT100 sensor removed from tank pocket, - refitted. High level sounder and SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By:		Date	23/7/09	Accepted By:	
Signature				Signature	Date

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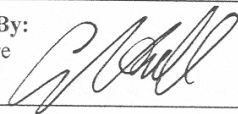
CERTIFICATE OF CALIBRATION

Customer	Envya Portlaoise	Contract	193001
Customer Instrument ID	V22 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 2009	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results			
INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.1	- 0.1	- 0.1
25.0	24.9	24.9	- 0.1
50.0	50.0	50.0	0
75.0	75.0	75.0	0
100.0	100.0	100.0	0
150.0	150.0	150.0	0
Instrument Calibration Results			
75.0	75.2	75.2	+ 0.2
Comment: High Level sounder and screen alarm found working OK			

Calibration Equipment				
Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	I93001
Customer Instrument ID	V37 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.1	- 0.1	- 0.1
25.0	24.7	24.7	- 0.3
50.0	49.9	49.9	- 0.1
75.0	74.7	74.7	- 0.3
100.0	99.7	99.7	- 0.3
150.0	149.9	149.9	- 0.1

Instrument Calibration Results

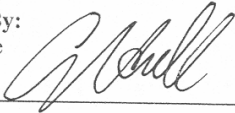
75.0	75.1	75.1	+ 0.1
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Comment: High level sounder and SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	I93001
Customer Instrument ID	V18 Bottom	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 2009	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results			
INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.2	- 0.2	- 0.2
25.0	24.8	24.8	- 0.2
50.0	49.8	49.8	- 0.2
75.0	74.6	74.6	- 0.4
100.0	99.3	99.3	- 0.7
150.0	149.6	149.6	- 0.4
Instrument Calibration Results			
75.0	73.4	73.4	- 1.6
<i>Comment: High level sounder and SCADA screen Alarm found working OK</i>			

Calibration Equipment				
Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature 	Date 23/7/09	Accepted By: Signature _____	Date _____
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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	193001
Customer Instrument ID	UCO9 Bottom Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.1	- 0.1	- 0.1
25.0	25.0	25.0	0
50.0	50.0	50.0	0
75.0	75.1	75.1	+ 0.1
100.0	100.3	100.3	+ 0.3
150.0	150.4	150.4	+ 0.4

Instrument Calibration Results

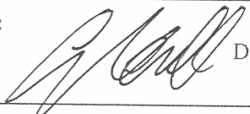
75.0	75.1	75.1	+ 0.1
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Comment: High level sounder and SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

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Tel: 028 43725970 Fax: 028 43725846 email: scadaireland@aolcom

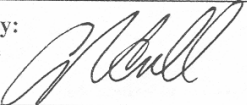
CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	193001
Customer Instrument ID	UC10 Bottom Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or - 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results			
INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.3	- 0.3	- 0.3
25.0	24.8	24.8	- 0.2
50.0	49.8	49.8	- 0.2
75.0	74.9	74.9	- 0.1
100.0	100.0	100.0	0
150.0	150.1	150.1	+ 0.1
Instrument Calibration Results			
75.0	75.0	75.0	0
Comment: High level sounder and SCADA screen Alarm found working OK			

Calibration Equipment				
Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	I93001
Customer Instrument ID	UC10 Top Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.4	- 0.4	- 0.4
25.0	24.8	24.8	- 0.2
50.0	49.9	49.9	- 0.1
75.0	75.0	75.0	0
100.0	99.9	99.9	- 0.1
150.0	149.9	149.9	- 0.1

Instrument Calibration Results

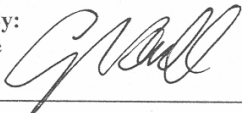
75.0	75.2	75.2	+ 0.2
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Comment: High level sounder and SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

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Tel: 028 43725970 Fax: 028 43725846 email: scadaireland@aol.com


CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	I93001
Customer Instrument ID	SS1 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results			
INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.1	- 0.1	- 0.1
25.0	25.5	25.5	+ 0.5
50.0	50.3	50.3	+ 0.3
75.0	75.0	75.0	0
100.0	100.1	100.1	+ 0.1
150.0	150.2	150.2	+ 0.2
Instrument Calibration Results			
75.0	75.0	75.2	+ 0.2
Comment: High level sounder and SCADA screen Alarm found working OK			

Calibration Equipment				
Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	193001
Customer Instrument ID	SS2 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.1	- 0.1	- 0.1
25.0	24.9	24.9	- 0.1
50.0	50.0	50.0	0
75.0	75.2	75.2	+ 0.2
100.0	100.3	100.3	+ 0.3
150.0	150.4	150.4	+ 0.4

Instrument Calibration Results

75.0	75.2	75.2	+ 0.2
------	------	------	-------


Comment: High level sounder and SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By:
Signature



Date

23/7/09

Accepted By:
Signature

Date

SCADA IRELAND LTD

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CERTIFICATE OF CALIBRATION

Customer	Envva Portlaoise	Contract	I93001
Customer Instrument ID	SS3 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	0.2	0.2	0.2
25.0	24.9	24.9	- 0.1
50.0	50.1	50.1	+ 0.1
75.0	75.2	75.2	+ 0.2
100.0	100.1	100.1	+ 0.1
150.0	150.3	150.3	+ 0.3

Instrument Calibration Results

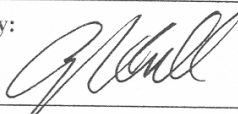
75.0	75.0	75.0	0
------	------	------	---

Comment: High level sounder and SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

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Tel: 028 43725970 Fax: 028 43725846 email: scadaireland@aolcom

CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	I93001
Customer Instrument ID	V24 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.7	- 0.7	- 0.7
25.0	24.3	24.3	- 0.7
50.0	49.4	49.4	- 0.6
75.0	74.3	74.3	- 0.7
100.0	99.4	99.4	- 0.6
150.0	149.1	149.1	- 0.9

Instrument Calibration Results

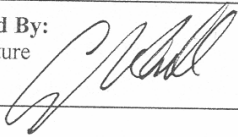
75.0	75.6	74.7	- 0.3
------	------	------	-------

Comment: High level sounder and SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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SCADA IRELAND LTD

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CERTIFICATE OF CALIBRATION

Customer	Enva Portlaoise	Contract	193001
Customer Instrument ID	V25 Temp	Location	Tank Farm
Device Description	PT100 Temperature Probe	Calibration Range	0 – 150 Deg C
Calibration Date	23 rd July 09	Interval	12 month
Instrument Accuracy	+ or – 0.1 Dec C	Calibration Due Date	July 2010

Loop Calibration Results

INPUT	AS FOUND	AS LEFT	DEVIATION
0.0	- 0.6	- 0.6	- 0.6
25.0	24.6	24.6	- 0.4
50.0	49.1	49.1	- 0.9
75.0	74.3	74.3	- 0.7
100.0	99.3	99.3	- 0.7
150.0	149.1	149.1	- 0.9

Instrument Calibration Results


75.0	74.7	74.7	- 0.3
------	------	------	-------

Comment: High level sounder and SCADA screen Alarm found working OK

Calibration Equipment

Manufacturer	Model	Serial Number	Calibration Date	Certificate No.
Eurolec	PC Temp PT2	84/PT2/100	3 rd Dec 2008	7944
Time Electronics	1042 Resistance	1203B2	3 rd Dec 2008	7934

DECLARATION: The calibration references used can be traced back to recognised national standards.

Tested By: Signature		Date	23/7/09	Accepted By: Signature		Date	
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Appendix 13



CLOSURE, RESTORATION, AFTERCARE MANAGEMENT PLAN

**Enva Ireland Ltd,
Clonminam Industrial Estate,
Portlaoise,
Co. Laois.**

License no: W0184-01

February. 2010



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CLOSURE, RESTORATION, AFTERCARE MANAGEMENT PLAN

Waste License W0184-01

1.0 INTRODUCTION & SCOPE STATEMENT

This Closure, Restoration, Aftercare Management Plan (CRAMP) has been prepared by Enva Ireland Ltd in respect of its facility in Portlaoise, Co. Laois in fulfilment of Condition 12.2 of Waste License number W0184-01.

An Initial Screening & Operational Risk Assessment has been carried out in accordance with the EPA guidance document on "Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006)". On the basis of the initial screening and operational risk assessment the Enva facility is classified as a Category 3 facility. As such this indicates that the full requirements for a Closure, Restoration and Aftercare Management Plan must be considered.

The scope of this risk assessment is the licensed activities covered under W0184-01 excluding those activities associated with operation of the sludge drying unit and associated CHP plant. This plan shall be reviewed annually and any necessary inclusions to the scope will be accommodated accordingly.

1.1 Closure Scenarios

As the facility has only recently commenced operations no site closure is envisioned in the near future. In the event of ceasing waste license activities (due to site closure or otherwise) it is envisioned that this would involve clean closure of all site infrastructure associated with the waste activities.



2.0 SITE EVALUATION

A detailed description of site activities, site location etc is set out in the Waste License Application of the waste licence granted for the site in January 2004.

2.1 Facility Description & History

Enva operates a waste acceptance, processing and transfer station located on a 5.65 acre site in Clonminam Industrial Estate, Portlaoise, Co. Laois. It operates a 12 hour day for 5 days a week with a half day Saturday.. Enva currently employs approximately 72 employees at the Portlaoise facility

A sister company of Enva, Emo Oil Services Ltd. maintains 9 storage tanks and a gantry on the site. It is assumed that in the event of Enva ceasing business and closing the facility that Emo will continue to maintain their current use of the site.

Enva accepts the following wastes on site as per Schedule A of its waste licence ref. W0184-01; waste oils, sludge's, oily absorbents, oil filters, soils contaminated with hydrocarbons, mixed fuels, antifreeze, brake fluid, fluorescent tubes, batteries, acids and bases. Enva also collects used cooking oils which is the predominant non-hazardous waste stream on site.

The facility's license also provides for activities related to a sludge drying facility. This activity has not commenced and is not envisioned to do so in the foreseeable future.

Enva have a dedicated processing plant for the recovery of waste oils. The Portlaoise facility also has analytical capability provided by an in-house laboratory, which includes waste oil and effluent analysis. Enva has a bunded tank farm which comprises of 18 waste oil storage tanks, 3 UCO tanks and 7 storage tank for final fuel oil product.

The facility also have soil bays dedicated to the treatment of contaminated soil. Enva provide bio-remediation and soil stabilisation treatment options.

Enva's 865m² waste storage building is dedicated to the segregation of incoming wastes and preparation of wastes prior to export.

Enva also provides warehousing for a range of waste storage and spill clean up products.

There are 3 surface water collection systems on site. The interceptors are equipped with coalescence filters for improved separation of solids and water prior to discharge.



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In the first system (SW-01), the main area of the site, i.e. the surface water from the central and south areas of the site is collected by yard gullies and drains to a 58 tonne capacity, four chamber interceptor located between the process building and the old tank farm. In this unit, separation of traces of oil takes place and the oil free water is pumped under level control from a post separation pump chamber to a second 30 tonne interceptor located near the west border of the site.

In the second system (SW-02) surface water from the north end of the site is collected and fed to the second separator mentioned above. The second separator is also fitted with a sensor, upon a large influx of oil entering the interceptor the release valve will shut down automatically. The water from the interceptors leaves the site and enters the municipal surface water system.

Effluent from the processing of waste oil is treated in the on site lime treatment plant prior to release to Portlaoise wastewater treatment plant via the town sewer.

Minor contamination of groundwater was identified in quarterly groundwater reports undertaken in accordance with waste licence conditions. The following two reports, the first entitled "An Environmental Site Investigations Report" by URS in July 2005 and the second entitled "A Summary Report on the Trend of Contaminant Levels at Enva Ireland Since 2005" by RPS in 2007 have deemed contamination to be localised and due to historic activities undertaken at the site, prior to the acceptance of waste on site. The report also states that the groundwater contamination is not moving down gradient or off-site and that natural processes in the groundwater are attenuating the contamination on site. A further report was requested by the Agency in 2008 which was submitted in November 2008. Enva are currently awaiting feedback from the Agency with regard to the status of the conclusions made in this report.

2.2 Facility Compliance Status

Enva have been operating under the conditions of its waste licence W0184-1 since it was issued the licence on the 16th of January 2004. Enva, Portlaoise have never been convicted under the Environmental Protection Act or any other environmental legislation. Enva, Portlaoise are largely compliant with their waste licence reference W0 184-01.

Historically, Enva experienced zinc exceedences in its wastewater emissions. To prevent reoccurrence of these exceedences Enva invested significant resources in the installation of a lime wastewater treatment plant which removes the metal content of the waste water and as a result have improved the quality of the effluent off site.



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Eight non-compliances were reported during the 2009 calendar year. There was one incident due to an exceedance in an effluent parameter, Two of these were related to odour complaints, three were due to malfunction of equipment, one to administrative issues., and one due to a failure of a third party waste contractor failing to notify Enva of a change in destination to which waste from Enva was taken to.

Further to the EPA guidance document on "Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006)" a compliance record score of 3 is judged to be appropriate for Enva.

2.3 Facility Processes and Activities

Enva provides a nationwide collection service for waste oils. Waste oils are collected from customers by tanker and delivered to the Enva facility. The tanker weighs in on site, connects to the unloading gantry and has its contents transferred to bulk storage tanks within the bunded tank farm on site. All operations thus take place within a bunded area. Tanks are controlled by a SCADA system and fitted with level alarms which sound at three stages these are high, high-high and high-high-high. All relevant records as required by legislation and by the license are retained.

Enva process the waste oils on site to form a final fuel oil product known as 11Is. 11Is must meet the specified limits for parameters as listed in Schedule G of Envas waste licence prior to transport off site.

Mixed fuels are collected both by tanker and in suitable UN approved drums. Mixed fuels are bulk stored on site in an underground storage tank prior to being transported off site to an approved facility.

Packaged waste (e.g.batteries, fluorescent light bulbs, etc) are collected from customer sites and delivered to Enva and unloaded into waste storage areas. Packaged containers will be given a tracking code and entered into a database / recording system. The packages will be stored in local bunds within the waste handling area and segregated according to procedures based on UK HSE Guidelines for storage and warehousing of packaged dangerous goods, HSG 71. Packaged wastes are bulked and dispatched to an approved recovery / disposal outlets via TFS.

The license allows for acceptance of non-hazardous sludge and associated on-site treatment by means of sludge drying. This activity will not commence in the foreseeable future and is therefore outside the scope of this CRAMP until such time as the situation changes.

Other activities at the site include the storage of waste storage and spill treatment products. These activities are outside the scope of the license.

2.4 Inventory of Site Buildings, Plant, Raw Materials and Wastes

In the event of closure the following inventory would have to be considered:

- Office and Laboratory with associated welfare facilities
- Lockers and Showers for operatives and drivers
- Workshop
- Electrics room
- Dry Cleaning area
- Process room
- UST of 30,000 litre capacity for the storage of Petrol
- Boiler House
- Loading/Unloading Gantries x 3
- Oil transfer pumps and valves;
- A bunded tank farm consists of 40 tanks that range in capacity from 50,000litres, 140,000, 200,000, 1,000,000 and 2,000,000 litres. The following substances are contained within these tanks are; waste oil, LS tanks, cooking oil, kerosene tanks, Gas Oil and Derv
- Bunded flammable waste storage area 217m²
- Sludge bay for tanker dig out
- A bunded storage unit for the receiving and storage of hazardous waste materials
- Soil Sheds
- Weighbridge;
- Enclosed Process Building – Oil Filters and Oily Rags
- 360m² building used for general storage of equipment etc. The floors of each section are fully bunded. The exterior of the building is clad with fire resistant cladding;
- Bunded effluent lime treatment plant area 210m²
- Surface water drainage network with 3 oil interceptors of 58 and 30 (2) tonnes in capacity fitted with SW1 and SW2 final interceptors being equipped with a coalescence filter.
- Concrete surfacing
- General stores area



3.0 CLOSURE CONSIDERATIONS

3.1 Clean or Non Clean Closure Declaration

In the event of permanently ceasing all waste activities at the site or in the event of full site closure, Enva would envision a clean closure. No wastes are buried on site and according to independent analysis of groundwater monitoring results; there is localised contamination of groundwater detected onsite and that natural processes in the groundwater are attenuating the contamination on site.

Therefore it is expected that there would be no significant remaining environmental liabilities following full or part closure.

3.2 Plant or Equipment Decontamination Requirements

Following removal of remaining waste (liquid and packaged waste) all waste oil tanks, bunds, associated pipelines, pumps, spill trays and the oil interceptor would be decontaminated.

All bulk storage and associated pipelines, pumps, valves, spill trays, with the exception of the EMO tanks will be empty and cleaned to a gas free standard. The process equipment will be oil free and electrically isolated.

At this point the only operational area will be the boiler room with the associated LPG supply, the treatment plant, the laboratory and some of the administration area. There will be temporary designated storage area with adequate secondary containment to facilitate any miscellaneous or unanticipated waste or chemical arising during latter stages of decommissioning.

All non-process related material will be removed for use to local business or sent to an approved facility for recovery or disposal.

The waste water treatment plant is only to be decommissioned at the penultimate stage in the decommissioning plan as it will be treating liquid residues from other decommissioning activities.

Surface water interceptors will be de-sludged and steam cleaned and the resulting sludge removed for treatment off site.

It is assumed at this stage no further liquid effluent will be generated on site. The treatment plant will be isolated but not physically disconnected from incoming flow. A connection will be maintained for emergency purposes. Any remaining untreated effluent will be treated as normal.

Treatment tanks and equipment will then be de-sludged and the resulting sludge disposed of as a hazardous waste. The tanks will be steam cleaned and the resulting washings disposed of as hazardous waste.

Once all areas of the site are considered adequately clean, the boiler will be decommissioned. The LPG supply boiler may be isolated but this will depend on the need for the boiler by Emo Oil. The boiler house floors and fuel pipework will be cleaned and the washings treated on site.

All remaining packaged wastes would be sent to approved facilities for final disposal/recovery.

All bunded areas and the floor of the waste handling area would be inspected for any signs of surface contamination and if necessary this would be washed from the surfaces as above.

A CCTV inspection of stormwater drains and gullies would be carried out and any residues washed to the oil interceptors as appropriate. Following this the oil interceptor would be desludged and washed out to remove any residual traces of oil. The interceptors would be inspected for signs of contamination or presence of residue and cleaned out with clean water.

All drains associated with the foul sewer system would also be flushed with clean water.

Lab equipment used for on-site environmental analysis would be cleaned / wiped down if necessary.

Any hazardous residuals such as the following:

- Asbestos cement tiles in the warehouse roof – a survey of the roof will be undertaken at the decommissioning stage and its recommendations followed where practicable.
- Fire-fighting foam and other extinguishers will remain assuming EMO assume operation of the site.
- Lab and workshop chemicals will be disposed of in an appropriate manner to a licenced facility.
- Lab GC instrument containing radioactive material – There is a radioactive source on-site, in the form of a Ni63, 555 MBq unit located in the laboratory Gas Chromatography (GC) machine. However, it is anticipated that the GC instrument would most likely be sold on as an asset.
- Emergency generator fuel – since Emo Oil would presumably remain on site, the emergency generator will not be decommissioned and the diesel oil supply maintained locally for the generator.
- Boiler treatment chemicals
- Fluorescent tubes, batteries and toner cartridges will be sent via existing disposal/recovery routes.

3.3 Plant Disposal or Recovery



All plant items have inherent value for reuse within Enva Ireland Ltd or for sale to a third party as appropriate. Infrastructure such as the building, bunds, diversion tank, stormwater drains, groundwater monitoring wells, weighbridge, foul sewer network would remain in situ as they form part of the inherent capital value of the site and do not themselves present potential for environmental pollution.

Tanks, pumps, spill trays, laboratory equipment etc may either be removed for use on another Enva Ireland Ltd site or sale to third party or they may remain in place for use on-site (i.e. for non-waste activities).

3.4 Waste Disposal or Recovery

All wastes including those listed below will be dispatched to approved third party waste contractors. Recovery/reuse options for wastes will be sought in preference to treatment/disposal where this is possible and appropriate.

- Packaged wastes.
- Waste oil from bulk oil tanks.
- Sludge / residue from the interceptor.
- Washings from tanks, bunds, floors, equipment, and diversion tank.
- General refuse.
- Lab wastes.

Unused absorbent material for spillage control may be reused within Enva Ireland Ltd or sold to a third party.

3.5 Soil Removal

There is no on-site landfilling at the Enva facility. Contaminated soil accepted from customers prior to the cessation of waste acceptance activities will be removed to existing approved treatment routes and where required via TFS.



4.0 CRITERIA FOR SUCCESSFUL CLOSURE

4.1 Addressing of Site Environmental Liabilities at Closure

Successful clean closure will be expected to be achieved when it can be demonstrated that there are no remaining environmental liabilities at the site. In practice this will require demonstration that the following criteria have been met:

- There are no residues which could pose an environmental hazard remaining on or within plant and equipment associated with waste activities.
- All wastes associated with licensed waste activities and with the cleaning and decontamination of plant and equipment as part of the closure have been removed off site to appropriately licensed facilities and carried by hauliers who have appropriate waste collection permits.
- Groundwater monitoring carried out following plant decontamination and waste removal indicates that no residual contamination exists within the soils or groundwater as a result of site activities.
- All relevant records relating to the closure have been retained on file.

5.0 CLOSURE PLAN COSTING

5.1 Decontamination Costs

Costs associated with decontamination of tanks, bunds, floors, drains, interceptors would include detergent/caustic wash, labour, use of tanker / IBCs, hire of power washer unit. Labour would be supplied from within Enva's own existing resources. Hire of a tanker and power washer would also be from within Enva's existing resources. Water and energy is supplied to the site and is not expected to present a significant cost over and above normal operating costs.

Desludging of the 3 oil interceptors would cost approximately €5,000.

Washing of floors with detergent / caustic would cost approximately €3,000.

5.2 Plant & Waste Disposal Costs

As indicated earlier plant and equipment would have inherent value and in many cases would in fact add to the capital value of the site following closure. There are therefore no net costs associated with plant and equipment.

Waste oil and packaged wastes from customers are accepted to the facility on a commercial basis. Thus costs of disposal are directly charged to the customer therefore there would be no net cost associated with disposal of these wastes.

The principal wastes for disposal would therefore be the waste washings from the decontamination activities. It is anticipated that there could be up to 50 tonnes of washings for disposal which would be treated and discharged from the facility. Sludge's from the cleaning out of tanks is estimated to create up to 250 tonnes of oily sludge's. These would have to be exported for disposal/recovery, the estimated cost of disposal/recovery is €400/tonne amounting to €100,000.

The cleaning and decontamination of all the tanks on site is estimated to be approximately €241,250. This is based on 96 days required to carry out the cleaning of each tank at a cost of €2, 500 for each days activities.

Other wastes may include a small quantity of lab waste as well as general refuse. Estimated costs for these would be expected at less than €10,000.

5.3 On-going monitoring

It is not envisioned that any on-going monitoring would be required at the site. However, prior to closure the following monitoring and reports would be required to finalise the closure:



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- CCTV of stormwater drains.
- One round of groundwater monitoring.
- Validation audit.

It is estimated that the costs of the CCTV would be of the order of €3,000 and the groundwater monitoring and report would be of the order of €10,000. €35,000 is allowed for the remediation of any possible soil contamination present on site. The use of an excavator is also allowed should it be required.

An independent audit will be carried out by external competent specialists in order to validate the implementation of the CRAMP. Costs of this are expected to be in the order €4,000.

5.4 Facility Security and Staffing

During closure facility security would be provided in the normal way and would not be expected to constitute additional costs. The site is surrounded with an 8 foot high palisade fence with three entrance gates which are operated by a fob system. The gates can additionally be padlocked if required.

Staffing would be provided from within Enva's own resources for the purposes of decontamination and cleanup. No additional costs are envisioned in respect of this.

5.5 Summary of Costs

The total costs associated with this CRAMP are estimated as follows;

DESCRIPTION	COST
Desludging of oil interceptors	€5,000
Cost of floor washing	€3,000
Desludging/cleaning of storage tanks	€241,250
Disposal of oily sludge's	€100,000
Disposal of other wastes	€10,000
CCTV of stormwater drains	€3,000
One round of soil and groundwater monitoring report	€10,000
Remediation of soil	€35,000
Excavator for ground investigations	€2,352
Validation audit and report	€4,000
TOTAL	€413,602



6.0 CLOSURE PLAN UPDATE AND REVIEW

6.1 Proposed Frequency of Review

As per the waste license condition 4.3.1 it is proposed to review this CRAMP annually and to revise it whenever this is warranted due to significant changes to costs, site conditions, plant, infrastructure or waste activities.

6.2 Proposed Scope of Review

The annual review of the CRAMP referred to above will include the entire document.



7.0 CLOSURE PLAN IMPLEMENTATION

7.1 EPA Notification

In the event that closure is planned. Enva will notify the Agency in writing as soon as is feasible in advance of the closure. Enva would aim to ensure that this notification takes place at least one week in advance of implementing the CRAMP.

7.2 Local or other Statutory Authority notifications

The closure of waste activities at Enva Ireland Ltd in Portlaoise would not be likely to concern any other agencies or authorities. It is therefore not envisioned that any notification other than that mentioned in Section 7.1 above would be required.

7.3 Test Programme

There are no test programmes relevant to the closure.

7.4 Full or Partial Closure considerations

It is conceivable that a part of Enva's waste activities could be closed while others continue. In this event the plant, equipment, raw materials and wastes relating only to the part of the waste activities which are closed will be closed in accordance with this plan. For partial closure the specific components which are within the scope of the closure will be listed within the notification referred to in Section 7.1 above and validation against successful closure criteria will be carried out in respect of the listed items only.



8.0 CLOSURE PLAN VALIDATION

8.1 Closure Validation Audit

As part of the closure, Enva would employ an independent environmental specialist with experience and recognised qualifications as an environmental auditor (e.g. membership of IEMA or similar) to conduct a validation audit against the requirements of this CRAMP particularly the criteria set out in Section 4.1. The scope of the audit shall be the same as the scope of the closure.

8.2 Closure Validation Audit Report

An audit report would be prepared by the independent auditor clearly setting out the overall conclusions of the audit and specifying whether the audit criteria had been achieved.

8.3 Closure Validation Certificate

The closure will be deemed to be complete if all criteria set out in Section 4.1 have been deemed to be achieved in the auditor's report. This shall be regarded as certification of completion of the closure in accordance with this plan. The auditor's report will then be submitted to the Agency.



9.0 RESTORATION AND AFTERCARE MANAGEMENT PLAN (RAMP)

As indicated in Section 1, Enva is classified as a Category 3 risk site by default and therefore must consider the need for a Restoration and Aftercare Management Plan (RAMP). The EPA guidance document recognises that the majority, but not all, Category 3 facilities will require a restoration and aftercare management plan. In particular, the guidance document states that RAMP is needed for non-clean closure.

Enva Ireland Ltd would envision a clean closure for its Portlaoise waste activities and therefore would not envision the need for restoration or any aftercare. Part of the site closure plan includes verification that no significant contamination remains with soils/groundwater following closure. In the event that there are any remaining residues which could pose a hazard to the environment or that soil / groundwater contamination is discovered this situation will be reviewed.

9.1 Site Restoration and Aftercare Management Costs

In view of the above there are no anticipated costs associated with site restoration and aftercare management post closure.

Appendix 14



Environmental Liability Risk assessment.

**Enva Ireland Ltd,
Clonminam Industrial. Estate,
Portlaoise,
Co. Laois.**

License no: W0184-01

March.2010

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1. INTRODUCTION

1.1. General

Enva Ireland Limited (Enva) operates a waste licensed facility in Clonminam industrial estate, Portlaoise, Co. Laois comprising of the following:

- Office and Laboratory with associated welfare facilities
- Lockers and Showers for operatives and drivers
- Workshop
- Electrics room
- Dry Cleaning area
- Process room
- UST of 30,000 litre capacity for the storage of Petrol
- Boiler House
- Loading/Unloading Gantries x 3
- Oil transfer pumps and valves;
- A bunded tank farm consists of 40 tanks that range in capacity from 50,000litres, 140,000, 200,000, 1,000,000 and 2,000,000 litres. The following substances are contained within these tanks are; waste oil, 11LS, cooking oil, kero tanks, Gas Oil and Derv
- Bunded flammable waste storage area 217m²
- Sludge bay for tanker dig out
- A bunded storage unit for the receiving and storage of hazardous waste materials
- Soil Sheds
- Weighbridge;
- Enclosed Process Building – Oil Filters and Oily Rags
- 360m² building used for general storage of equipment etc. The floors of each section are fully bunded. The exterior of the building is cladded with fire resistant cladding;
- Bunded effluent lime treatment plant area 210m²
- Surface water drainage network with 3 oil interceptors of 58 and 30 (30) tonnes in capacity fitted with coalescence filter.
- General stores area.
- Concrete surfacing

Environmental management of the site is regulated by the conditions prescribed in the sites Waste Management Licence Register No. W0184-01 issued on the 16th of January 2004 by the Environmental Protection Agency (Agency).

Clause 12.2 of the Waste Licence requires the preparation and submittal to the Agency of an Environmental Liabilities Risk Assessment (ELRA). The specific requirements are as follows:

12.2.2 The licensee shall arrange for the completion by an independent and appropriately qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA), which addresses the liabilities from past and present activities. A report on this assessment shall be submitted to the Agency for agreement within twelve months of date of grant of this licence. The ELRA shall be reviewed as necessary to reflect any significant change on site, and in any case every three years following initial agreement: review results are to be notified as part of the AER.

12.2.3 As part of the measures identified in Condition 12.2.1, the licensee shall, to the satisfaction of the Agency, make financial provision to cover any liabilities identified in Condition 12.2.2. The amount of indemnity held shall be reviewed and revised as necessary, but at least annually. Proof of renewal or revision of such financial indemnity shall be included in the annual 'statement of measures' report identified in Condition 12.2.1.

The most recent EPA Guidance Document entitled "*Guidance on Environmental Liabilities Risk Assessment, Residuals Management Plans and Financial Provision, copyright 2006*" – (hereafter referred to the EPA ELRA Guidance Document 2006) was used in the preparation of this Environmental Liabilities Risk Assessment.

Enva Ireland Ltd – Portlaoise - Environmental Liabilities Risk Assessment

Enva Ireland, Clonminam Industrial Estate, Portlaoise, Co. Laois was granted a Waste Licence (Register Number 184-1) on the 16th of January 2004. Included in this licence was the provision to install a sludge drying facility and associated CHP plant. However Enva has not as yet installed a sludge drying facility and associated CHP plant and therefore it has not been considered within the ELRA.

1.2. Environmental Liabilities Risk Assessments

Any industrial site has the potential to generate environmental liabilities, i.e. damage to the environment, which must be remedied, such remediation being associated with a quantifiable financial cost.

Environmental liabilities may arise from *anticipated* or *foreseeable* events, i.e. known and quantifiable releases to the environment, which arise due to the day-to-day operation of the facility. For a site subject to Waste Licensing, regular emissions to air, water and land have typically been the subject of detailed quantification and consequence analysis, i.e. assessment of the impact of emissions, during the licence application process. The resulting Waste Licence either establishes emission limits and other conditions at a level which prevents the arising of new liabilities, or which may require bonding or other secure funding mechanism to cover any expected liability. The latter case applies usually to, for example, on-site land filling activities.

Environmental liabilities may also arise from unanticipated or unforeseen events. Such events may be generally classified under the following headings:

- Events which are *sudden*, and which are identifiable as an incident or a series of related incidents, which give rise to an environmental liability concurrent with the incident or shortly thereafter;
- Events, which develop gradually or go unnoticed for a long period of time, which gradually gives rise to an environmental liability.

Examples of the former would include explosion/fire or accidental release of chemicals from a storage tank to a watercourse.

An example of the latter would be leaks in underground storage tanks or transfer lines, which would result in the gradual build-up of soil and/or groundwater contamination.

The costs of dealing with unanticipated or unforeseen events are usually issues which are addressed in the insurance cover for the industrial site in question. The degree to which existing insurance policies cover environmental liabilities depends on many factors including the specific wording of the policies and legal precedence. Most Public Liability insurance policies will contain some element of cover for environmental liabilities.

However, the extent and applicability of coverage is dependent on analysis of and professional judgement on the particular insurance policy.

Environmental liability risk assessment (ELRA) considers the risk of unplanned events occurring during the operation of a facility that could result in unknown liabilities materialising. Based on an initial risk categorisation of the activity into Low, Medium or High risk, different approaches are recommended according to the risk category. Simple approaches are proposed for low risk facilities to more detailed site-specific approaches involving detailed environmental liability risk assessment for higher risk facilities.

1.3. Basis for the ELRA

This report has been provided for the sole use of Enva and for submission to the EPA in accordance with the EPA guidance document entitled "Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision".

The basis of this ELRA is as follows:

- A review of the activities carried out at the site, including process and services;
- A review of the following documentation:
 - Waste Licence Application Files;
 - Environmental Aspects and Impacts Register;
 - Environmental Management Programme;
 - HSE Management System Manual
 - Emergency Response Plan
 - Risk Assessments Register
 - Closure, Restoration, Aftercare Management Plan
 - Bund Integrity Report; and,
 - Operational Procedures.
- Identification of existing and potential hazards, including evaluation of materials and wastes generated; and,
- Consideration of historic environmental incidents and remediation works undertaken.

This report is based on the desk-based study research and a site inspection, a thorough assessment was made of potential environmental liabilities requiring

remediation to which costs could be assigned. Remedial actions are described for these and remediation or corrective costs are identified.

This reported is reviewed as minimum every three years as part of the Annual Environmental Report.

1.4. Key Considerations

There is a reasonable degree of subjectivity and uncertainty involved in Environmental Liabilities Risk Assessment so it is important to identify at an early stage that the following was taken into account:

Enva maintains site conditions in accordance with their Waste License No. W0184-01 and has an Environmental Management System (EMS) accredited to ISO 14001. No provision has been made for costs associated with any criminal proceedings that could arise, as firstly, it is understood that there is goodwill and a strong desire by Enva to remain compliant with relevant legislation and EPA requirements, and secondly, such costs are uninsurable and therefore cannot be underwritten by any third party or insurance organisation.

The ELRA has been based upon historic and current operational activities. It does not consider potential environmental liabilities associated with significant changes in use of the site, such as redevelopment for other commercial or industrial purposes by Enva or any other party, as these would require a separate risk assessment exercise should they arise. Furthermore, the ELRA does not include a costing of the decommissioning and oversight of the facility in the event of a full site closure.

1.5. Structure of the ELRA

The ELRA report is structured as follows:

Section 2 provides an overview of the Enva facility including details of existing processes, buildings and structures present on the site at the time this report was prepared.

Section 3 describes the initial screening and operational risk assessment carried out for the facility.

Section 4 provides an overview of the historical environmental liabilities at the facility.

Section 5 provides an overview of the existing measures in place at the site to minimise possible environmental liabilities associated with the facility.

Section 6 describes the site specific risk assessment, which was carried out for the facility. It includes section on Risk Identification, Occurrence Likelihood, Severity Assessment, Risk Evaluation and Prevention/Mitigation

Section 7 describes the financial provisions in place to deal with any unknown liabilities and identifies possible gaps between the level of cover provided and the level of risk associated with the facility.

Section 8 provides a summary and conclusion.

2. OVERVIEW OF ENVA

2.1. Site Location & Site History

Enva operates a waste acceptance, processing and transfer station located in Clonminam Industrial Estate, Portlaoise, Co. Laois. A site location map is shown in **Figure 1** (See Appendix 1)

Prior to Enva Ireland Ltd. acquiring the site it is understood that the site was developed from a greenfield site

2.2. History of Enva

Enva can trace its history back to 1972, when Atlas Oil(now known as Enva) was set up to collect waste oil primarily from the automotive industry, making it the longest standing hazardous waste management company in Ireland. The original waste facility was established in Portlaoise in 1978 initially to process waste oil.

In 1987, the company was purchased by Irish sales marketing and business support services group DCC plc, and between 1988 and 2000, services grew to include; Industrial and Automotive Services; Field Services; Environmental Products and Emergency Response. In 1999 Atlas Oil was issued an IPPC licence. In 2000, the facility in Portlaoise was awarded the first and only license for off-site treatment of petroleum contaminated soil by the EPA. In 1994 the Portlaoise facility was issued a Waste Licence ref 184-01 under which it currently operates

As part of DCC's ongoing expansion of DCC Environmental, Cork based water and effluent treatment firm Envirotech, was purchased in 2001. In January 2003, DCC acquired Shannon Environmental Services. This company based in Shannon provides key hazardous waste infrastructure in Ireland. The Shannon facility offers a range of Physico-Chemical and Biological treatment & disposal options.

In May 2005 Atlas purchased a waste licensed facility in Dublin. The facility currently acts as a base for their Underground Services division.

As the original business had grown significantly through a series of acquisitions, in June 2006, the decision was taken to re-brand all businesses under one new name and logo – Enva.

2.3. Site and Process Description

Enva operates a waste acceptance, processing and transfer station located in Clonminam Industrial Estate, Portlaoise, Co.Laois. It operates a 12 hour day for 5 days a week with a half day Saturday. Enva currently employs approximately 72 employees at the Portlaoise facility.

Enva accepts the following wastes on site as per Schedule A of its waste licence ref. 184-01; waste oils, sludge's, oily absorbents, oil filters, soils contaminated with hydrocarbons, mixed fuels, antifreeze brakefluid, fluorescent tubes, batteries, contaminated packaging and acids and bases.

Enva applied to accept non-hazardous sludges under its waste licence however have yet to commence this activity with prior approval from the EPA.

Enva also provides warehousing for a range of waste storage and spill clean up products. The Portlaoise facility also has analytical capability provided by an in-house laboratory, which includes effluent and waste oil analysis.

The main features of this facility are summarised as follows:

- Office and Laboratory with associated welfare facilities
- Lockers and Showers for operatives and drivers
- Workshop
- Electrics room
- Dry Cleaning area
- Process room
- UST of 30,000 litre capacity for the storage of Petrol
- Boiler House
- Loading/Unloading Gantries x 3
- Oil transfer pumps and valves;
- A bunded tank farm consists of 40 tanks that range in capacity from 50,000litres, 140,000, 200,000, 1,000,000 and 2,000,000 litres. The following substances are contained within these tanks are; waste oil, 11ls tanks, kero tanks, Gas Oil and Derv
- Bunded flammable waste storage area of 217m²
- Sludge bay for tanker dig out
- A bunded storage unit for the receiving and storage of hazardous waste materials
- Soil Sheds
- Weighbridge;
- Enclosed Process Building – Oil Filters and Oily Rags
- 360m² building used for general storage of equipment etc. The floors of each section are fully bunded. The exterior of the building is clad with fire resistant cladding;
- Bunded effluent lime treatment plant area 210m²
- Surface water drainage network with two oil interceptors of 58 and 30 tonnes in capacity fitted with coalescence filter.
- Concrete surfacing

3. SCREENING AND OPERATIONAL RISK ASSESSMENT

3.1. General

As a starting point in the process, a relatively simple risk assessment decision matrix can be used to classify sites into Risk Categories (1-3) and thereby select the specific ELRA and Financial Provision (FP) requirements that will be needed. The risk assessment decision matrix outlined in the EPA ELRA Guidance Document 2006 was used.

The risk category assigned to the facility depends on the complexity of operations at the site, the environmental sensitivity of the receiving environment and the compliance record of the facility.

- **Complexity** – the extent and magnitude of potential hazards present due to the operation of the facility (e.g. a function of the nature of the activity, the volumes of hazardous materials stored on site etc.). A Complexity Band (G1 least complex to G5 most complex) for each class of activity has been assigned and included in a Look-Up Table (Appendix B of the EPA ELRA Guidance Document 2006).
- **Environmental Sensitivity** – the sensitivity of the receiving environment in the vicinity of the facility, with more sensitive locations given a higher score (e.g. the presence of aquifers below the site, groundwater vulnerability, the proximity to surface water bodies and their status, the proximity to sensitive human receptors, etc). The Environmental Sensitivity is calculated on a site-specific basis using a sub-matrix (Table 3.1).
- **Compliance Record** – the compliance history of the facility.
Each aspect is multiplied to give the **Total Score** for the facility, and this can be used to place the facility into an appropriate Risk Category as follows:
Risk Category 1 = Score < 5
Risk Category 2 = Score 5-23
Risk Category 3 = Score > 23.
Once this has been completed, the licensee proceeds through the relevant steps of ELRA and FP that are considered appropriate for the Risk Category.

3.2. Complexity

Significant work has been done by the Environment Agency (England and Wales) in the development of the Environmental Protection Operator and Pollution Risk Appraisal (EPOPRA) methodology for classifying activities, and a similar but shortened version of this methodology has been developed for this process. Complexity Bands have where available, been derived from similar classification in the EP OPRA Complexity Score. A look up table for Irish activities has been included in Appendix B of the EPA's ELRA Guidance Document 2006.

The Complexity Band is used to determine the value used in the Operational Risk Assessments as follows: G1 = 1, G2 = 2, G3 = 3, G4 = 4 and G5 = 5

In January 2004, Enva were granted a revised Waste License Registration No. W0184-01, under Classes 6, 7, 12 and 13 in accordance with the Third Schedule of the Waste Management Acts 1996 to 2005 and Classes 2, 4, 5, 8, 9, 11, 12 and 13 in accordance with the Fourth Schedule of the Waste Management Acts 1996 to 2005.

The relevant complexity band for Enva according to the EPA's ELRA Guidance Document 2006 is based on the following:

The following are activities that Enva are licensed to undertake under the following classes;

Class 6 (third schedule) and Class 2 (fourth schedule):

Class 6: Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule.

Class 2: Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes):

Under Class 6 and 2 Enva accepts soils contaminated with hydrocarbons on site for biological treatment and remediation. Where soils cannot be fully remediated on the Portlaoise site they are sent to hazardous landfill.

Enva have covered treatment bays dedicated to the acceptance, storage and treatment of contaminated soil.

Class 8 (fourth schedule) and Class 9 (fourth schedule):

Class 8(fourth): Oil re-refining or other re-uses of oil:

This activity is limited to the recycling and treatment of waste oil and waste fuel, and the separation of hydrocarbon sludges, into oil, water and sludge fractions, and the subsequent recovery of segregated fractions, and the re-refining of other oils subject to the agreement of the Agency.

Class 9 (fourth): Use of any waste principally as a fuel or other means to generate energy: This activity is limited to the use of recovered oil as a fuel for the generation of power or steam.

Class 11 (fourth schedule):

Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule: This activity is limited to the use of wastes obtained from any activity referred to in a preceding (paragraph of this Schedule for onward recovery, on or offsite, subject to the agreement of the Agency.

Class 12 (third and fourth scheduled)

Repacking prior to submission to any activity referred to in a preceding paragraph of this Schedule. This activity is limited to the recovery of oily solid wastes and used filters for onward recovery. Enva currently repackage oily absorbents, oil filters and batteries prior to disposal off site.

Class 13 (third and fourth schedule):

Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced (third & fourth schedule).

The acceptance of waste oils in bulk tankers is currently undertaken at the Enva site in Portlaoise. Enva has 18 waste oil storage tanks varying in capacity from 50,000 to 1,000,000 litres. These tanks are located in the tank farm where all the waste oil is stored. Waste oil is classified as a hazardous waste and this site processes approximately 24,000 tonnes per annum.

The following activities have as yet to be undertaken on the Enva Portlaoise site-

Enva is also licensed to undertake activities under Class 4 (fourth schedule), Class 5 (fourth schedule) and Class 7 (third schedule) however Enva have not undertaken activities assigned to these classes to date.

Class 4 (fourth schedule): Recycling or reclamation of other inorganic materials:

Class 5 (fourth schedule): Regeneration of acids or bases:
This activity is limited to the reconditioning of acids or bases for reuse.

Class 7 (third schedule): Physio-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcinations) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraph 1 to 10 of this Schedule.

Based on the information above and the EPA's ELRA Guidance Document 2006, the relevant complexity band for Enva according to this activity is G5. More than one scheduled activity is located at Enva Portlaoise therefore in accordance with the EPA's ELRA Guidance Document 2006 the highest Complexity Band was chosen.

Enva stores >10, 000 tonnes per annum of hazardous waste destined for recovery. This is deemed to be a Class 13 activity as listed in the third and fourth schedules.

Based on this information, Appendix B of the EPA's ELRA Guidance Document 2006 places Enva in the G5 complexity band in accordance with guidance document the G5 complexity band gets a score of 5.

3.3. Environmental Sensitivity

A sub-matrix for environmental sensitivity for the Enva site is presented in Table 3.2. This considers 6 key potential environmental receptors and assigns individual scores that are added together to arrive at a total environmental attribute score. The scoring system used is outlined in EPA ELRA Guidance Document 2006. The total environmental attribute score is used to look up the environmental sensitivity classification in Table 3.1 below.

The environmental sensitivity sub matrix has been developed based on professional judgment and with reference to the system designed in the EP OPRA Scheme by the Environment Agency (UK). The environmental sensitivity classification is used in the operational risk assessment to calculate the total score. The relevant scores are highlighted and underlined in Table 3.2.

The key receptors include:

- Human Beings
- Groundwater
- Surface Water
- Air Quality
- Protected Ecological Sites
- Sensitive Agricultural Receptors

Table 3.1 - Environmental Sensitivity Sub-Matrix

Environmental Attribute	Environmental	Attribute Score (Notes 1,2)
Human Occupation		
<50m		5
<u>50m-250m</u>		<u>3</u>
250m–1,000m		1
>1km		0
Groundwater Protection		
<u>Regionally Important Aquifer</u>		<u>2</u>
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 Water		N/A
Class A		3
Class B		2
Class C		1
<u>Class D</u>		<u>0</u>
Designated Coastal & Estuarine Waters		2
Potentially Eutrophic Coastal & Estuarine Waters		1
Air Quality & Topography		
Complex Terrain		2
Intermediate Terrain		1
<u>Simple Terrain</u>		<u>0</u>
Protected Ecological Sites		
Within or directly bordering protected site		2
<1km to protected site		1
<u>>1km to protected site</u>		<u>0</u>
Sensitive Agricultural Receptors		
<50m from site boundary		2
50m-150m from site boundary		1
<u>>150m from site boundary</u>		<u>0</u>

Note 1 – The environmental attribute which is relevant to the Enva facility is underlined and bold.

Note 2 – The scoring system used is taken from the EPA ELRA Guidance Document 2006.

Based on the above Environmental Sensitivity Sub-Matrix, the total environmental attribute score for Enva is calculated as follows

Table 3.2

Environmental Attribute	Attribute Score
Human Beings	3
Groundwater	2
Surface Water	0
Air Quality	0
Protected Ecological Sites	0
Sensitive Agricultural Receptors	0
TOTAL SCORE	5

Based on the above Environmental Sensitivity Sub-Matrix, the total environmental attribute score for Enva Portlaoise site is 5. Using Table 3.1 from the EPAs ELRA Guidance Document.

Table 3.3 Environmental Sensitivity Classification

Total Environmental Attribute Score	Environmental Sensitivity Classification
1	<7
2	7-12 2
3	>12 3

Table 3.1 and 3.2 above indicates that the Total Environmental Attribute Score for the Enva Portlaoise site is 5. Based on Table 3.3 the Environmental Sensitivity Classification for a site that has a Total Environmental Attribute Score less than 7 is low. Therefore Enva has low Environmental Sensitivity Classification.

3.4. Compliance Record

The compliance record score is derived from the compliance history of the facility and whether the activities carried on resulted in contamination or pollution.

For newly licensed facilities and those operating without non-compliance of emission limits, then these are classified as **Compliant/New Facility** and have a score of 1.

Licensed facilities with administrative non-compliances only are classified as administrative non-compliant and have a score of 2.

Licensed facilities with minor non-compliances (< 5 non-compliances in 12 month period) are classified as being **Minor Non-Compliant** and have a score of 3. Facilities with minor soil and groundwater contamination (i.e. those with concentrations above background but not posing risk to the environment) are also considered in the class.

Licensed facilities with major non-compliance history (≥ 5 non-compliances in a 12 month period) and/or those with significant soil and groundwater contamination (i.e. requiring remediation and/or long-term monitoring requirements) are classified as **Major Non-Compliant/Significant Ground Contamination** and have a score of 4.

Those facilities with repeated non-compliances (>10 Total) during a 12 month period are classified as **Repeat Non-Compliance** and have a score of 5.

As part of the preparation of this ELRA a review of soil or groundwater assessments for the Portlaoise site and of the compliance status for Enva Portlaoise in relation to their Waste Licence was examined.

In relation to the sites soil and groundwater, minor contamination of groundwater was identified in quarterly groundwater reports. However the following reports undertaken by URS and RPS respectively have identified that this contamination is localised and is due to historic activities undertaken at the site prior to the acceptance of waste on site.

“An Environmental Site Investigations Report” (July 2005) and “A Summary Report on the Trend of Contaminant Levels at Enva Ireland Ltd. Since 2005” (2007) which states that the groundwater contamination is not moving down gradient or off-site and that natural processes in the groundwater are attenuating the contamination on site.

Enva, Portlaoise have never been convicted under the Environmental Protection Act or any other environmental legislation. Enva, Portlaoise are largely compliant with their waste licence reference W0 184-01. In 2009 there was 1 non conformance in relation to the effluent exceedance. Other incidents reported to the Agency included 2 odour complaints, one malfunction of equipment, one administrative error and one due to a third party contractor sending waste to a site not approved by Enva.

From the compliance review as detailed above a compliance record score of 3 is judged to be appropriate for Enva.

3.5. Risk Category

The preceding subsection of this report has determined the:

Complexity Score (G5) = 5

Environmental Sensitivity Score = 5

Compliance Record Score = 3

The product of these scores is used to calculate a total score, which is then used to assign the site specific risk category (Table 3.3). The product of the above scores is 175, which according to table 3.3 below indicates that Risk Category 3 would be applicable to the Enva Site.

Table 3.3 – Risk Category

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

Based on the calculations above the Enva site would be classified in Risk Category 3. In addition, based on guidance provided in the EPA ELRA Guidance Document 2006 for activities with complexity of G4 or G5 these facilities are automatically classified as Risk Category 3.

4. HISTORICAL ENVIRONMENTAL LIABILITIES

4.1. Releases to Air

With regard to sudden and accidental releases to air, there is no history of:

- Major fires or explosions at the site;
- Run-away reactions resulting in significant discharge to atmosphere;
- Significant accidental releases of hazardous gases.

Licensed emissions to atmosphere arise from the on-site boiler and have been the subject of a comprehensive monitoring programme, the results of which are forwarded to the Agency on an annual basis.

There is an emission point which relates to a sludge drying facility that was part of the licence application but which has not as yet been installed. Therefore this emission point can be considered outside the scope of this ELRA.

Based on a review of the sites activities there is no evidence to suggest that site operations have resulted in the development of any off-site environmental liability with respect to air emissions.

4.2. Process Water

Process effluent consists of water removal from the waste oil processing system. The process effluent is then released to the effluent lime treatment plant to remove the heavy metal content. The effluent is sampled prior to and following release. Envas in house laboratory determines the COD loading of the effluent and sets the Scada system on site to release accordingly. The Scada system is an electronic system that alerts staff of the levels within tanks and releases tank contents as programmed. The Scada is linked to the auto sampler which takes an effluent sample every 2m³ on release or can be re-adjusted if the volume of the batch is lower than the normal volume. The final effluent from the wastewater treatment system is discharged to the sewer and finally Portlaoise Waste Water Treatment Plant.

In the past Enva incurred exceedences of its effluent limits as set out in Schedule C.4 of its waste licence W0 184-1 in respect of zinc. However the installation and use of the lime treatment plant eliminated the occurrence of these exceedences. There were no exceedences with regard to zinc in 2009.

There is no evidence to suggest that process wastewater releases from the site have had any significant impact or resulted in an environmental liability.

4.3. Surface Water Discharges

All Envas waste storage areas are bunded and all Envas main operational activities undertaken within the bunded area of the site. Surface water from the yard area and roof areas is collected by 3 interceptors.

SW-01 comprises of two interceptors, an interceptor which collects the run off from the southern end of the site (i.e. waste oil offloading area) which then drains to the main interceptor for the yard area. This interceptor is a class I with a coalescence filter and v-notch weir.

At the beginning of 2009 improvements were made to the surface of the yard at the north end of the site, additional drainage channels were put in place and a second Class I interceptor was installed this collects water from the general yard area and the roofs of all the waste storage buildings. A small portion of the north end of the site remains unsealed. This area of the site is used for the storage of cleaned redundant plant.

Envas waste licence Schedules C.3. and D.4. sets out emission limit values and monitoring requirements in relation to surface water. Enva are compliant with these licence limits.

With regard to sudden and accidental discharges, there is no history of:

- Major fires or explosions at the site resulting in significant discharges of firewater;
- There is no evidence to suggest that surface water releases from the site have had any significant impact or resulted in an environmental liability.

4.4. Releases to Ground/Groundwater

4.4.1. Background

The bedrock below the site is considered to be locally important fractured aquifer by the Geological Survey of Ireland (GSI). Regional groundwater flow is expected to be in an easterly direction towards the Triogue River, which is a tributary of the River Barrow. The Triogue River is located 1.5km to the east of the site. It would be expected that the groundwater will discharge to the Triogue and possibly its tributaries as base flow in the rivers.

Groundwater was encountered in the sand and gravel during borehole drilling on the site as part of the URS investigation, and groundwater level measurements have indicated that groundwater flows in an east-south-easterly direction in the sand and gravel below the site. The Shallow groundwater flow is generally towards the east. Groundwater flow within the limestone bedrock occurs within fractures. The boreholes at the site are intersecting different fracture zones and the connection between them is unknown.

Public water supply for Portlaoise is obtained from two groundwater supplies in the area. The primary source is located at Ballydavis, which is approximately 4km to the northeast of Portlaoise, and the second location is located along R426 to the south east of Portlaoise. The Ballydavis site is located at considerable distance from the site and on the opposite side of the Triogue

River and would therefore not be a risk from any groundwater contamination present on the site.

4.4.2 Prevention of Groundwater Contamination

All process operations and storage of wastes are within bunded areas. Stormwater drains are provided with oil interceptors fitted with coalescence filters. These containment measures ensure that accidental release of these compounds do not impact soil and groundwater quality below the site. An extensive programme of groundwater monitoring is required as part of Enva's waste licence ref. 184-01. Enva is required under its licence to monitor parameters as listed in Schedule D.6 of the licence on an annual, quarterly and monthly basis.

Enva's groundwater monitoring programme includes the monitoring of four shallow boreholes (BH101, BH102, BH 103 and BH 104) which were drilled to depths of 6 to 7 metres below ground level (mbgl) and three deep boreholes (MW01, MW02 and MW03) which were drilled to depths of up to 30mbgl. Groundwater monitoring is undertaken on a quarterly basis by external consultants. During each round of monitoring both deep and shallow ground water wells are sampled and the results presented in a groundwater monitoring which is submitted to the EPA as part of the EPA quarterly report.

4.4.3 Previous Soil and Groundwater Investigations

In 2005 Enva requested URS to summarise all soil investigations and groundwater monitoring carried out by URS at the site up until 2005. This report was entitled "The Environmental Site Investigations Summary Report" and stated that ongoing monitoring indicated that there is some localised residual hydrocarbon contamination of BH104b. The laboratory also reported low levels of tentatively identified compounds in MW03 as possible alkenes. However the report also stated that at the monitoring round for June 2005 indicated concentrations of hydrocarbon contaminants are decreasing over time.

In 2007 Enva made a formal response to issues raised in the EPA's audit report of February 2007. This formal response took the form of a study undertaken by RPS consultants entitled "Summary report on the Trend of Contaminant Levels at Enva Ireland Ltd. Since 2005". This report determines that following from the risk assessment and trend analysis undertaken by RPS that there are no unacceptable risks and that the observed contaminants in BH104b, BH103 and MW03 are in reality at trace levels typical of other waste handling facilities. The report goes on to state that "Under the philosophy of UK EA R&D 20 no action is required as the observed concentrations do not represent a risk to water quality down gradient on-site and particularly off-site.

A further Summary report was requested in January 2008 by the Agency and a report was submitted by Enva in November 2008. This report has summarised that the risk to the ground water off site is low as the contamination present is in non aqueous phase liquids with in the water and therefore not significantly mobile. Further input from the Agency is pending with regard to this matter.

5. EXISTING ENVIRONMENTAL CONTROLS AT ENVA

5.1. General

The Enva waste facility at Portlaoise is equipped with a high level of environmental protection systems. Ongoing care for the environment is demonstrated by the efficient operation and maintenance of environmental protection systems/practices, and their upgrade where necessary, together with ongoing efforts aimed at the continuous minimisation of emissions. The site has a programme of continuous improvement, through for example the training of people to maintain good environmental practices, and replacement, upgrading, retro-fitting, as needed, of instrumentation and equipment.

Enva, have a Health, Safety and Environmental Policy that covers all it's facilities in Ireland. The policy aims to instil high environmental values in all employees, utilising the best environmental practices in processing and contributing to global sustainable developments.

The Enva facility in Portlaoise has invested in infrastructure designed to assure a high level of environmental compliance and protection. Examples of this include the following:

- Office and Laboratory with associated welfare facilities
- Lockers and Showers for operatives and drivers
- Workshop
- Electrics room
- Dry Cleaning area
- Process room
- UST of 30,000 litre capacity for the storage of Petrol
- Boiler House
- Loading/Unloading Gantries x 3
- Oil transfer pumps and valves;
- A bunded tank farm consists of 40 tanks that range in capacity from 50,000litres, 140,000, 200,000, 1,000,000 and 2,000,000 litres. The following substances are contained within these tanks are; waste oil, LS tanks, cooking oil, kero tanks, Gas Oil and Derv
- Bunded flammable waste storage area 217m²
- Sludge bay for tanker dig out
- A bunded storage unit for the receiving and storage of hazardous waste materials
- Soil Sheds
- Weighbridge;
- Enclosed Process Building – Oil Filters and Oily Rags
- 360m² building used for general storage of equipment etc. The floors of each section are fully bunded. The exterior of the building is cladded with fire resistant cladding;
- Bunded effluent lime treatment plant area 210m²
- Surface water drainage network with 3 oil/water interceptors of 58 and 30(2) tonnes in capacity fitted with coalescence filter.
- Concrete surfacing

Environmental protection and compliance is integrated into the sites decision-making process through the management of change mechanisms defined in the site's certified ISO14001 Environmental Management System (EMS).

5.2. Environmental Management

Enva operates an integrated approach to the management of environmental aspects of the site, and environmental protection and compliance has always been a key consideration. Since January 2004, the site has operated under the waste licensing system. The site was audited for accreditation to ISO 14001 and OHSAS 18001 and was certified in August 2007.

The environmental management system is based on a combination of technical measures, documented environmental management programmes and documented procedures, whose objectives include:

- Complying with all the requirements of the site waste licence,
- Eliminating the risk of accidental events which could give rise to significant releases to the environment, and
- Ongoing continuous improvement of site environmental performance.

5.3. Releases to Atmosphere

There are no process emissions to atmosphere. Licensed emissions to atmosphere arise from the on-site boiler and have been the subject of a comprehensive monitoring programme, the results of which are forwarded to the Agency on an annual basis.

Minor emissions may result from laboratory fume hoods or from machinery/plant (e.g. vehicles). Pipeline inspection as required by the license and preventive maintenance will also minimise potential for fugitive loss.

Regular maintenance of vehicles and plant will minimise unnecessary atmospheric releases.

The waste licence includes a process (sludge drying facility), which it not intended to be carried out within the foreseeable future. In the event that this changes the evaluation of this aspect will be revised accordingly.

5.4. Releases to Surface Water and Groundwater

5.4.1. General

All storm water runs to the site drainage system and is discharged to municipal surface water system having first passed through a two-stage oil interceptor fitted with coalescence filters. In the event of large volumes of contaminated firewater being generated the interceptor release valves will be manually shut down and fire water pumps used to pump the contaminated firewater back into the bunded tank farm.

Storm drains are monitored on a weekly basis as per license requirements.

Wastewater generated from the processing of waste oil is treated in Envas onsite lime treatment plant prior to release to Portlaoise waste water treatment plant.

All process operations and storage of wastes are within bunded areas. Studies undertaken on the analysis and trends of groundwater monitoring results to date show any contamination of hydrocarbons noted are decreasing overtime. Envas waste licence requires extensive ongoing monitoring of surface, wastewater and groundwater.

5.5. Emergency Planning/Preparedness

The site has a detailed and documented Emergency Response Plan (ERP). The ERP describes the emergency response system onsite and also contains specific action plans in the event of particular incidents such as fire/explosions, chemical spillage or medical emergency. The priority in the event of any emergency situation will be to ensure the safety of all people potentially affected by the incident, whether they are on-site or outside the site boundary. After this, the aim will be to prevent releases of pollutants and prevent damage to property or the environment.

The primary front line of defence against most emergency situations (such as fires and some major spills) will be the local Fire Services. No Enva Portlaoise personnel are expected to carry out front line defence in major emergency situations.

An Emergency Core Team set up internally at the site, will coordinate an emergency response, which will aim to support the Fire Services' front line response. The Emergency Core Team will carry out specific duties but will not include direct front line (e.g. fire fighting) duties.

A permit to work system is in place on site and all staff have received fire extinguisher training. Full evacuation drills are held periodically to familiarise employees with evacuation requirements and to ensure head counts are completed effectively.

The fire-fighting services have been brought on site and made fully aware of the available on-site fire fighting and detection systems.

5.6. Prevention of Fire

5.6.1. Procedures

The plant ERP specifies the actions taken on discovering a fire or other emergency. The ERP includes the activation of fire alarms, evacuation and assembly requirements. Fire prevention is emphasised by engineering design, work permit restrictions, work practices, and ongoing audits of process taking into consideration fire risk and safety awareness. Standard operational procedures (SOPs) and Safety Data Sheets (SDSs) specify emergency response requirements for various materials being used.

5.6.2. Training

All employees and contractors working on site are provided with induction training. The contents of the induction course for employees includes the following;

- HSE Manual and Policy
- Environmental requirements
- HSE requirements
- Emergency Response Plan

Only employees and contractors trained in the equipment, plant or machinery that they intend to operate are permitted to use it. Training must also be received in the procedures and risk assessments to which these items and activities relate before being permitted to use them. A training programme is in place to ensure each employee is made aware of HSE requirements related to their work activities. Job specific HSE training is also provided within each Department. This consists of training on appropriate risk assessments, standard operating procedures (SOPs), external task specific training and awareness training relating to our business.

Relevant employees also receive training on the permit to work system in place on site and all staff has received fire extinguisher training. Envas emergency response team members have received fire warden training. Full evacuation drills are held periodically to familiarise employees with evacuation requirements and to ensure head counts are completed effectively.

Considerable time and resources are utilised in the provision of training across the company. An annual training needs assessment is carried out and covers all personnel within the company. This is carried out by the HSE Department in conjunction with Line Managers and supervisors. A training plan is then drafted for the year ahead and courses organized accordingly.

The delivery of training involves both external training using training contractors to provide industrial task related training and internal training focusing on company specific procedures.

5.6.3. Equipment

The plant fire protection system includes smoke, heat and flame detector alarms, which are installed in appropriate areas around the site. There are four fire hydrants and a number of fire extinguishers available on site. All fire protection systems are subject to monthly and 6 monthly and annual maintenance inspections.

Enva have a security monitoring system in place that operates after hours on site. The gate at the main entrance to the site operates using a secure key system provided to authorised members of staff.

5.6.4. Storage and Handling of Flammable Materials

The Enva Portlaoise site has a designated bunded storage area for flammable materials.

An underground storage tank (UST) containing three chambers with a capacity of 30,000 litres is used specifically for the storage of petrol. This UST is linked to the Scada system to ensure that any leaks are communicated to operational staff.

The movement of waste oils is through direct pumping from tankers into one of the storage tanks on site. These storage tanks are bunded and the bunds subject to bund integrity testing as per licence requirements. Transfer to and from the tanks by tankers is done within the bunded area of the site. Tanks have high level alarms and are controlled by a computer system. Waste Oils have a flash point $>220^{\circ}\text{C}$. Operational procedures are in place to ensure that all waste oils are pumped to a designated tank as approved by the yard operative.

Enva employed the services of PM consultancy to undertake an ATEX report which included; "Risk Assessment of Hazardous Areas", "Explosion Protection Document" and "Hazardous Area Classification Report". This reports details the existing controls in place and has identified zoned areas on site.

5.6.5. Firewater Retention

Further to a firewater risk assessment undertaken by URS Dames & Moore, the Enva, Portlaoise site was deemed to have a medium risk rating. This overall risk rating is dominated by the environmental risk of a migration of oil contaminated fire water from the site. In this regard the largest volume calculated is that for a tank fire in the 2,300 tonne storage tank of final product in the tank farm. The total volume estimated is 842m^3 to include a simultaneous major rainfall event. This volume coupled with a medium risk of a fire occurring in the EMO Oil storage tanks which are located in the same area. However, there is adequate retention volume in the bund surrounding the tank farm to take estimated volume of fire water runoff.

In the event of large volumes of contaminated firewater being generated from fire fighting from areas such as the process room, unloading gantry and warehouse, the interceptor release valves will be manually shut down and fire water pumps used to pump the contaminated firewater back into the bunded tank farm.

5.7. Hazard Studies

Enva have a register of risk assessments for this site. The register of risk assessments includes environmental risk assessments such as this ELRA and firewater retention. The register lists actions to be taken on identified risks and outlines progress made to date.

6. SITE SPECIFIC ELRA ASSESSMENT

6.1. General

Enva Portlaoise is classified as a Risk Category 3 facility. The objectives of the ELRA are:

- 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 the identified financial provisions; and
- To provide a mechanism to encourage continuous environmental improvement through the management of potential environmental risks.

The methodology presented in the EPA, ELRA Guidance Document, 2006 will be outlined in the proceeding section of this report. It includes a Risk Management Programme for the mitigation and management of any environmental liabilities identified at Enva. This programme is not required for the calculation or implementation of a financial provision at a facility. However, such a programme would encourage continuous environmental improvement and the reduction of environmental liabilities.

The ELRA will 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.

6.2. Methodology – Risk Identification, Likelihood and Consequence

The following steps were undertaken as part of the site-specific ELRA;

- Risk Identification
- Risk Classification (includes an Occurrence Assessment and a Severity Assessment)
- Risk Evaluation
- Risk Prevention/Mitigation

6.2.1. Risk Identification

Risks were identified on the site through a combination of:

1. What-if analysis - A suggested method of carrying out this process is to initially identify all the 'processes' on site, list the hazards associated with each process, identify potential causes of failure of the processes and analyse the potential impacts on the environment.

Table 6.1 Example Hazard Identification Table

Risk ID	Potential Hazard	Environmental Effect
1	Describe scenario for occurrence of potential liability e.g. spill of solvent from solvent storage tank	Describe consequence of proposed scenario e.g. spill of solvent goes to surface water.

6.2.2. Risk Classification-Occurrence Analysis

Having identified the potential risk, the likelihood of its occurrence needs to be assessed.

An analysis of historical data and existing environmental controls, as outlined in previous actions of this report, was utilised when estimating *likelihood* of identified potential risks occurring at Enva. The following table defines various likelihoods of occurrence:

Table 6.2 Risk Classification Table - Occurrence

<i>Rating/ Score</i>	<i>Category</i>	<i>Description</i>	<i>Likelihood of Occurrence (%)</i>
1	Very Low	Very low chance of hazard occurring in 30 yr period	0-5
2	Low	Low chance of hazard occurring in 30 yr period	5-10
3	Medium	Medium chance of hazard occurring in 30 yr period	10-20
4	High	High chance of hazard occurring in 30 yr period	20-50
5	Very High	Greater than 50% chance of occurring in 30 yr period	>50

6.2.3. Risk Classification-Severity Assessment

Once the environmental impact had been identified one of the following consequences is assigned.

Table 6.3 Risk Classification Table - Severity Criteria

<i>Rating/ Score</i>	<i>Category</i>	<i>Description</i>	<i>Cost of Remediation (€)Note 1</i>
1	Trivial	No damage or negligible change to the environment	<10,000
2	Minor	Minor impact/localised or nuisance	10,000-100,000
3	Moderate	Moderate damage to the environment	100,000-500,000
4	Major	Severe damage to the environment	500,000-1,000,000
5	Massive	Massive damage to a large area, irreversible in medium term	>1,000,000

Note 1 – Costs specific to Enva

6.2.4. Risk Evaluation

Having identified the hazard and decided on its likelihood and severity, the significance of the risk is assigned. A risk score is determined by multiplying the occurrence score by the severity score. The risk scores can be tabulated in a risk matrix.

Occurrence	V. High	5					
	High	4					
	Medium	3					
	Low	2					
	V. Low	1					
			1	2	3	4	5
			Trivial	Minor	Moderate	Major	Massive
			Severity				

Where:

- **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 / Yellow** – These are medium-level risks requiring action, but are not as critical as a red coded risk.
- **Green (light and dark green)** – These are lowest-level risks and indicate a need for continuing awareness and monitoring on a regular basis. Whilst there 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.

For all identified risks appropriate financial provision must be made to address any associated liabilities. With regard to 'medium' and 'high' risks the ELRA must detail how these risks will be minimised to acceptable levels.

6.2.5. Risk Prevention/Mitigation

Mitigation measures are assigned to each risk and each Risk Score is revised using post-mitigation severity and occurrence rankings. The risks are then re-ranked and tabulated in the risk matrix to illustrate the overall degree of risk reduction resulting from the risk mitigation measures. Where appropriate, the mitigation measures are accepted for implementation. A Risk Management Programme is then prepared for the ongoing management of risks and the implementation of risk mitigation measures. Target timeframes are also allocated for the implementation of each risk mitigation measure.

6.3. Identification of Risks at Enva

'Processes' on the Enva, Portlaoise site were identified, the hazards associated with each process listed along with the identification of any potential causes of process failures. If any effect to the environment could be identified from the failure, the effect was analysed and this was listed as a risk. A Risk Register was then developed which contained all of the Risks identified on site.

The costs associated with the known environmental liabilities (e.g. closure and aftercare costs) for the Enva facilities were calculated through the preparation and costing of the Closure, Restoration and Aftercare Management Plan (refer to Site Specific CRAMP).

Each process was considered separately and a 'what if' analysis was utilised to identify all risks associated with the process in question. A list of risks was developed and these were entered into a Risk Register. Table 6.4 illustrates the Risk Register.

Table 6.4 Enva Risk Register Risk

Risk ID	Potential Failure Mode
1	A spill occurring during the loading/unloading of waste on-site.
2	A failure of one of the bulk storage tanks resulting in a spill of waste oil.
3	Loss of integrity within bunded areas.
4	Improper disposal of hazardous waste.
5	Failure of underground drainage network or wastewater treatment system resulting in significant release to ground and groundwater
6.	An on-site fire/explosion
7	Failure of on-site environmental control and monitoring systems.

These risks were assessed against the risk classification tables (RCTs) as provided in Table 6.2 and 6.3. The risk classification table was designed to reflect the critical levels of risk appropriate to the Enva site. Ratings, taken from the relevant risk classification table, were applied to the severity and likelihood of occurrence of each risk

Table 6.5 below illustrates the assessment carried out for each risk in terms of its severity and likelihood of occurrence.

Table 6.5 Enva site Risk Assessment

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
1	Loading/ Unloading of wastes	Spill of waste oil, or packaged waste, which could migrate to surface water or ground.	Contamination of Surface Water Groundwater or Soil Contamination.	1	<p>Waste oils are delivered to site on a daily basis. Loading and unloading of waste oil takes place in designated bunded areas.</p> <p>Packaged waste are delivered to site in suitable receptacles following documented procedures and stored in designated bunded areas.</p> <p>Large storage areas are covered reducing run off from these areas</p> <p>Enva staffs are trained in the procedures and risk assessments on the acceptance, collection and transport as well as processing of hazardous wastes.</p> <p>Unknown wastes are sampled and analysed prior to acceptance. Enva has trained Dangerous Goods Safety Advisors on site. Enva only permits the transport of dangerous goods by ADR licensed drivers.</p> <p>Site surface water passes through an oil interceptor with fitted coalescence filter prior to discharge.</p>	2	Based on the systems in place to control surface water contamination. There should be minor impact of any spilled waste.

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
2	Storage of waste oil .	Bulk storage tank failure.	Contamination of Surface Water, Groundwater or Soil Contamination.	1	<p>All bulk storage tanks are located within the bunded tank farm; retention capacity is at least 110% of the largest tank.</p> <p>Bund, tank and container integrity assessments are undertaken every three years and reported to the EPA.</p> <p>Envas Scada system monitors the levels within each tank electronically. Level alarms sound at high, high-high and high-high-high levels and as a result will alert staff to the potential for overflow.The system can be operated manually if required.</p> <p>The UST is fitted with a leak detection system which is also linked to the Scada system.</p>	2	<p>Large volume bulk storage tanks on-site.</p> <p>Materials therein have the capacity to cause environmental damage if failure was to occur resulting in ground and /or surface water contamination.</p> <p>Any impact on soil, groundwater or surface water would be localised.</p>

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
3	Storage of waste oil and used cooking oil in bulk storage tanks. Mixed Fuels in UST and packaged waste in bunded incoming bay.	Loss of integrity of bunded areas	Surface Water, Groundwater or Soil Contamination.	1	<p>Bund, tank and container integrity assessments are undertaken every three years and reported to the EPA.</p> <p>It is very unlikely that all bunded areas will fail at the same time.</p> <p>The yard surface where general operational activities take place is concreted and bunded.</p> <p>Comprehensive Emergency Response Plan in place at the site that includes dealing with spills.</p> <p>Operational personnel are trained in spill response. Operational staff are directed to stop spill at source and to place covers on site drains in the event of a spill.</p> <p>Envia has a dedicated spill response service.</p> <p>Spill kits are located on site.</p> <p>Any spillage observed within the bunds would be promptly detected and cleaned up.</p> <p>The UST is fitted with a leak</p>	3	Large volume bulk storage tanks on-site. Different categories of hazardous waste storage on-site. Certain materials therein have the capacity to cause significant environmental damage if failure was to occur resulting in ground and/or surface water contamination. However spilled material will be caught in the interceptor Any impact on soil, groundwater or surface water would be localised.

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
3 cont'd	As above	As above	As above	As above	<p>detection system.</p> <p>The incoming bay on-site is a purpose built bunded building with the capacity for segregation of waste types.</p> <p>All surface water runoff enters the sites drainage system and is discharged to municipal surface water system having first passed through an oil interceptor fitted with coalescence filters. A sensor is fitted on the onsite interceptors which in the event of a large influx of oil entering the interceptor will cause the release valve to shut down and so prevent any release of oil. An alarm sounds to notify staff when this occurs.</p>	As above	As above

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
4	Disposal of Hazardous / Non Hazardous Wastes	Improper classification / disposal of waste.	Contamination of Surface Water Groundwater or Soil Contamination. Public Health Risk if hazardous waste is disposed of in an appropriate manner.	1	<p>Waste oils are collected nationally and brought to the Enva facility in Portlaoise to be stored in tanks prior to processing into a fuel oil product known as 11Is which is the end product and therefore will not be transported to another site as a waste.</p> <p>Packaged wastes are accepted on site and sent to appropriately licensed facilities for ultimate disposal. These facilities must first be approved by the EPA for use, as per waste licence requirements.</p> <p>Enva tracks the movement of hazardous waste through the use of C1 forms and TFS documents. Enva also uses a bar-code system to track certain waste streams from the customer's site to the final point of destination.</p> <p>With enva's standard operating procedure and the considerable experience in managing hazardous waste, it is very unlikely that hazardous waste would be incorrectly managed.</p>	2	In the event of hazardous waste being treated as a non-hazardous waste it would not pose a threat to the environment as all wastes with the exception of waste oil, which is processed on site, are sent to licensed facilities whose acceptance criteria must be fulfilled.

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
4 cont'd	As above	As above	As above		<p>Enva organise the collection and transport of waste from the Enva site. Enva staff are responsible for loading waste and therefore have additional control.</p> <p>Enva staff are trained in the procedures and risk assessments on the acceptance, collection and transport as well as processing of wastes.</p> <p>Enva customer service representatives and sales personnel are trained in the hazards of dangerous goods. Unknown wastes are sampled and analysed prior to acceptance.</p> <p>Enva has trained Dangerous Goods Safety Advisors on site.</p> <p>Enva only permits the transport of dangerous goods by ADR licensed drivers.</p>		As above

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
5	Disposal of Wastewater	Failure of drainage network or wastewater treatment system resulting in significant release to ground and groundwater .	Contamination of Surface Water Groundwater or Soil Contamination.	1	<p>Envas process effluent is pumped across the site in pipelines above ground. Only treated effluent is released to sewer via an underground pipeline.</p> <p>Enva's process effluent is sent to the effluent lime treatment plant prior to release to remove the heavy metal content.</p> <p>The effluent is sampled prior to and following release. Enva's laboratory determines the COD loading of the effluent and sets the Scada system on site to release accordingly.</p> <p>Effluent tanks are on a cleaning schedule to remove build up of residues which could contaminate the effluent for discharge off site.</p> <p>A leaks inspection is carried out as part of the sites preventative maintenance schedule.</p> <p>Enva's effluent must meet the limits for the parameters as set out in Enva's waste licence reg no. W0 184-01.</p>	2	Severity is based mainly on potential need for soil remediation should leak occur.

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
5 cont'd	As above	As above	As above		<p>The final effluent from the wastewater treatment system is discharged to Portlaoise Waste Water Treatment Plant via the towns sewer.</p> <p>Effluent from canteen, toilet and shower areas are discharged directly to the Portlaoise town sewer which is directed to the Portlaoise waste water treatment plant.</p> <p>Liquid wastes from the laboratory are collected in containers and treated/disposed of through approved waste treatment/recovery outlets.</p> <p>The underground drainage networks are inspected every three years and repaired as necessary as per Envas waste licence conditions.</p>		As above

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
6	Any	Major on-site fire or explosion.	Release of toxic and hazardous material to atmosphere, surface water, groundwater or soil	1	<p>Enva requested PM Consultancy to complete an ATEX report for the site. This included a risk assessment of hazardous areas. The areas identified as hazardous around the Enva Portlaoise site were assessed and zoned accordingly.</p> <p>Waste oil accepted on site has a flash point > 220°C</p> <p>No credible scenarios have been identified which would result in the formation of a flammable atmosphere or the creation of mist droplets from either the tanks that store kerosene or diesel or from the heating of oils.</p> <p>UST leak detection system is in place and linked to Scada.</p> <p>There is a flame arrestor on the vent line to prevent propagation of flame from the vent back into the tank.</p> <p>Very low likelihood of tank being open at same time as un-noticed fire in adjacent premises.</p> <p>Manhole cover is made of non-sparking fibrolite polymer.</p> <p>Procedures require that all</p>	4	In the unlikely event of an explosion that resulted in contaminated firewater entering the local surface water it is likely that there would be severe damage to the local environment. All fire water run off can be prevented from leaving the site by turning off the valve on the final interceptor.

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
6 cont'd	As above	As above	As above		<p>equipment is earthed and bonded Permit to work procedure regulates hot work activities. All fixed electrical equipment in the area is rated for use in hazardous areas. Comprehensive control systems and maintenance programme in place to minimise the risk of fire.</p> <p>Flammable liquids are only accepted in UN approved containers. ADR trained drivers are only permitted to accept drums of flammable liquid that are in good condition. Envia have trained DGSA staff on site to identify non-conforming containers and re-package as necessary.</p> <p>Envia staff have received ATEX awareness training.</p> <p>Envia have a fully addressable fire alarm system in place. Envia also have a site security alarm that is linked to a 24hour monitoring service. A comprehensive Emergency Response plan is in place at the</p>		As above

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
6 cont'd	As above	As above	As above		<p>site.</p> <p>An internal Emergency Response Team are in place if fire does occur.</p> <p>Emergency response drills are undertaken. Suitable personnel have been designated and trained as fire wardens. All staff have received fire safety awareness and extinguisher training</p> <p>All bulk storage tanks are located within bunded tank farm; retention capacity is at least 110% of the largest tanks.</p> <p>Following from a report undertaken by URS Dames & Moore there is deemed to be adequate retention volume in the bund surrounding the tank farm to take an estimated volume of 842m³ fire water runoff.</p> <p>This estimated volume of firewater runoff is based on the following events occurring; a large volume of contaminated firewater being generated from fighting a fire in the 2300t storage tank of</p>		As above

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
6 cont'd	As above	As above	As above		<p>final product (11ls) and a medium risk fire in an EMO oil storage tank while simultaneously a major rainfall event occurs.</p> <p>The retention of fire water from fighting fires in areas such as the process room, unloading gantry and warehouse, will be managed by the manual shut down of the interceptor release valves while the fire water pumps will be used to pump the contaminated firewater from the interceptors back into the bunded tank farm.</p>		As above
7	Monitoring and Control Systems	Failure of on-site procedures	Release of hazardous material to atmosphere, surface water, groundwater	1	<p>The site has developed procedures for environmental monitoring and control such as loading and unloading of waste oil tankers, bund inspections and drainage system inspections. Internal process audits are undertaken annually.</p> <p>Enva are certified by SGS to both ISO 14001 and OHSAS 18001 and are audited by their holding company DCC. The EPA undertaken un-notified compliance audits against the sites waste licence. Annual reports are also submitted</p>	2	Minor impact/localised or nuisance

Risk ID	Process	Potential Hazard	Environmental Effect	Occurrence Rating	Basis of Occurrence	Severity Rating	Basis of Severity
7					to both Envas holding company, DCC and the EPA.		

6.4. Assessment of Risks at Enva

6.4.1. Risk Register

The risk register below ranks the risks in order to prioritise mitigation and management measures.

Table 6.6 Risk Register ranked by Risk Score

Risk ID	Description	Occurrence Rating	Severity Rating	Risk Score
6	Major Fire/Explosion	1	4	4
3	Bund Integrity Failure	1	3	3
5	Failure of underground drainage network.	1	2	2
1	Loading/unloading operations.	1	2	2
2	Bulk Storage tank failure.	1	2	2
4	Improper disposal of hazardous waste.	1	2	2
7	Failure of on-site environmental control procedures.	1	2	2

6.4.2. Risk Matrix

The risk matrix below indicates the critical nature of each risk. (Risk ID's from the Risk

Register have been used to complete this matrix.)

Table 6.7 – Risk Matrix

OCCURRENCE	V.High	5					
	High	4					
	Medium	3					
	Low	2	Risk ID 5				
	V.Low	1		Risk ID 1, 2, 4 and 7	Risk ID 3	Risk ID 6	
			1	2	3	4	5
			Trivial	Minor	Moderate	Major	Massive
SEVERITY							

Where:

Red is a high level risk.

Yellow is a medium level risk.

Green (light and dark) is a low level risk.

Table 6.7 above indicates that there are currently no risks identified in the red zones or yellow zones requiring priority attention. This is as a result of existing environmental controls in place at the site. All risks identified are located in the (dark and light) green zone indicating that these are currently low risk. However, it is important to note that these risks are considered low risk as a result of existing control measures employed at the site aimed at reducing/eliminating both the occurrence and where this is not possible the severity of these risks. There is a need for continuing awareness and monitoring of these risks on a regular basis.

6.5. Risk Prevention, Mitigation and Management

The risk assessment and categorisation phase identified no red or yellow zone risk, which requires immediate action. All risks were classified in the (dark and light) green zone risks and require monitoring on a regular basis.

However, the (dark and light) green zone risks may have the potential to increase to yellow or red zone risks, and where additional risk management measures are available to manage them at their current levels or reduce them further, these may be implemented if considered cost-effective.

Table 6.8 illustrates the risk mitigation measures, which have been identified or are currently in use at the site. This table provides the risks in descending order of risk score with the proposed mitigation measure.

Table 6.8 Risk Mitigation Form

Risk ID	Process	Potential Hazard	Risk Score before Mitigation	Existing/Possible Mitigation measures	Risk Manager	Time to Complete	Revised Risk Score
6	Any	Major Fire/Explosion	4	<p>Enva requested PM Consultancy to complete an ATEX report for the site. This included a risk assessment of hazardous areas. The areas identified as hazardous around the Enva Portlaoise site were assessed and zoned accordingly.</p> <p>Waste oil accepted on site has a flash point > 220°C</p> <p>No credible scenarios have been identified which would result in the formation of a flammable atmosphere or the creation of mist droplets from either the tanks that store kerosene or diesel or from the heating of coils in tanks containing waste oils.</p> <p>UST leak detection system is in place and linked to Scada.</p> <p>There is a flame arrestor on the vent line to prevent propagation of flame from the vent back into the tank.</p> <p>Very low likelihood of tank being open at same time as un-noticed fire in adjacent premises.</p>	HSE & Compliance Manager	Ongoing / Existing Practice	4

6 cont'd				<p>Manhole cover is made of non-sparking fibrolite polymer.</p> <p>Procedures require that all equipment is earthed and bonded</p> <p>Permit to work procedure regulates hot work activities.</p> <p>All fixed electrical equipment in the area is rated for use in hazardous areas.</p> <p>Comprehensive control systems and maintenance programme in place to minimise the risk of fire.</p> <p>Flammable liquids are only accepted in UN approved containers.</p> <p>ADR trained drivers are only permitted to accept drums of flammable liquid that are in good condition.</p> <p>Enva have trained DGSA staff on site to identify non-conforming containers.</p> <p>Enva staff have received ATEX awareness training.</p> <p>Enva have a fully addressable fire alarm system in place. Enva also have a site security alarm that is linked to a 24hour monitoring service.</p> <p>Comprehensive Emergency Response Plan is in place at the site.</p>			
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<p>6 cont'd</p>				<p>An internal Emergency Response Team are in place if fire does occur. Emergency response drills are undertaken. Suitable personnel have been designated and trained as fire wardens. All staff have received fire safety awareness and extinguisher training</p> <p>All bulk storage tanks are located within bunded tank farm; retention capacity is at least 110% of the largest tanks.</p> <p>Following from a report undertaken by URS Dames & Moore there is deemed to be adequate retention volume in the bund surrounding the tank farm to take an estimated volume of 842m³ fire water runoff. This estimated volume of firewater runoff is based on the following events occurring; a large volume of contaminated firewater being generated from fighting a fire in the 2300t storage tank of final product (11ls) and a medium risk fire in an EMO oil storage tank while simultaneously a major rainfall event occurs.</p> <p>The retention of fire water from fighting fires in areas such as the process room, unloading gantry and warehouse, will be</p>			
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6 cont'd				<p>managed by the manual shut down of the interceptor release valves and while the fire water pumps will be used to pump the contaminated firewater from the interceptors back into the bunded tank farm.</p> <p>Additional fire detection units were placed in the tank farm for improved fire prevention of fire spread.</p>			
3	<p>Storage of waste oil and used cooking oil in bulk storage tanks.</p> <p>Mixed Fuels in UST and packaged waste in bunded incoming bay.</p>	Bund Integrity Failure	3	<p>Bund, tank and container integrity assessments are undertaken every three years and reported to the EPA.</p> <p>It is very unlikely that all bunded areas will fail at the same time.</p> <p>The yard surface where general operational activities take place is concreted and bunded.</p> <p>Comprehensive Emergency Response Plan in place at the site that includes dealing with spills.</p> <p>Operational personnel are trained in spill response. Operational staff are directed to stop spill at source and to place covers on site drains in the event of a spill.</p> <p>Enva has a dedicated spill response service.</p>	HSE & Compliance Manager	Ongoing / Existing Practice	3
3							

cont'd				<p>Any spillage observed within the bunds would be promptly detected and cleaned up.</p> <p>The UST is fitted with a leak detection system.</p> <p>The incoming bay on-site is a purpose built bunded building with the capacity for segregation of waste types.</p> <p>All surface water runoff enters the sites drainage system and is discharged to municipal surface water system having first passed through an oil interceptor fitted with coalescence filters. The interceptors are fitted with a sensor that in the event of a large influx of oil entering the interceptor the release valve shuts down automatically to prevent any release of oil. An alarm sounds to notify staff when this occurs.</p>			
5	Disposal of wastewater	Failure of underground drainage network.	2	<p>Envas process effluent is pumped across the site in pipelines above ground. Only treated effluent is released to sewer via an underground pipeline.</p> <p>Enva's process effluent is released to the effluent lime treatment plant to remove the heavy metal content.</p>	HSE & Compliance Manager	Ongoing / Existing Practice	2
5 cont'd							

				<p>The effluent is sampled prior to and following release. Enva's laboratory determines the COD loading of the effluent and sets the Scada system on site to release accordingly. Effluent tanks are on a cleaning schedule to remove build up of residues contaminate the effluent for discharge off site.</p> <p>Enva's effluent must meet the limits for the parameters as set out in Enva's waste licence reg no. W0 184-01.</p> <p>The final effluent from the wastewater treatment system is discharged to Portlaoise Waste Water Treatment Plant via the towns sewer.</p> <p>Effluent from canteen, toilet and shower areas are discharged directly to the Portlaoise town sewer which is directed to the Portlaoise waste water treatment plant.</p> <p>Liquid wastes from the laboratory are collected in containers and treated/disposed of through approved waste treatment/recovery outlets.</p> <p>The underground drainage networks are tested every three years and repaired as necessary as per Envas waste licence conditions.</p>			
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1	Loading/and unloading of wastes	Spill from loading/unloading operations.	2	<p>Waste oils are delivered to site on a daily basis. Loading and unloading of waste oil takes place in designated bunded areas.</p> <p>Packaged waste are delivered to site in suitable receptacles following documented procedures and stored in designated bunded areas.</p> <p>Large storage areas are covered reducing run off from storage areas</p> <p>Enva staff are trained in the procedures and risk assessments on the acceptance, collection and transport as well as processing of hazardous wastes.</p> <p>Enva customer service representatives and sales personnel are trained in the hazards of dangerous goods. Unknown wastes are sampled and analysed prior to acceptance. Enva has trained Dangerous Goods Safety Advisors on site. Enva only permits the transport of dangerous goods by ADR licensed drivers.</p> <p>Site surface water passes through an oil interceptor with fitted coalescence filter prior to discharge.</p>	HSE & Compliance Manager	Ongoing / Existing Practice	2
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2	Storage of waste oil and cooking oil in bulk storage tanks.	Bulk Storage tank failure.	2	<p>All bulk storage tanks are located within the bunded tank farm; retention capacity is at least 110% of the largest tank.</p> <p>Bund, tank and container integrity assessments are undertaken every three years and reported to the EPA.</p> <p>Envas Scada system monitors the levels within each tank electronically. Level alarms sound at high, high-high and high-high-high levels and as a result will alert staff to the potential for overflow.</p> <p>The UST is fitted with a leak detection system which is also linked to the Scada system.</p>	HSE & Compliance Manager	Ongoing / Existing Practice / Regular reviews	2
4	Disposal of Hazardous / Non Hazardous Wastes	Improper disposal of hazardous waste.	2	<p>Waste oils are collected nationally and brought to the Enva facility in Portlaoise to be stored in tanks prior to processing into a fuel oil product known as 11ls which is the end product and therefore will not be transported to another site as a waste.</p> <p>Packaged wastes are accepted on site and sent to appropriately licensed facilities for ultimate disposal. These facilities must first be approved by the EPA for use, as per waste licence requirements.</p>	HSE & Compliance Manager	Ongoing / Existing Practice	2

4 cont'd				<p>Enva tracks the movement of hazardous waste through the use of C1 forms and TFS documents. Enva also uses a bar-code system to track certain packaged waste streams from the customers site to the final point of destination.</p> <p>Enva's standard operating procedures and the considerable experience Enva have in managing hazardous waste; it is very unlikely that hazardous waste would be incorrectly managed.</p> <p>Enva organise the collection and transport of waste from the Enva site. Enva staff are responsible for loading waste and therefore have additional control.</p> <p>Enva staff are trained in the procedures and risk assessments on the acceptance, collection and transport as well as processing of wastes.</p> <p>Enva customer service representatives and sales personnel are trained in the hazards of dangerous goods. Unknown wastes are sampled and analysed prior to acceptance. Enva has trained Dangerous Goods Safety Advisors on site. Enva only permits the transport of dangerous goods by ADR</p>			
-------------	--	--	--	---	--	--	--

4 cont'd				licensed drivers.			
7	Monitoring and Control Systems	Failure of on-site environmental control procedures.	2	<p>The site has developed procedures for environmental monitoring and control such as loading and unloading of waste oil tankers, bund inspections and drainage system inspections.</p> <p>Internal process audits are undertaken annually.</p> <p>Envia are certified by SGS to both ISO 14001 and OHSAS 18001 and are audited by their holding company DCC. The EPA undertaken un-notified compliance audits against the sites waste licence.</p> <p>Annual reports are also submitted to both Envas holding company, DCC and the EPA.</p>	HSE & Compliance Manager	Ongoing / Existing Practice	2

The risk matrix below remains unchanged from that presented in figure 6.7.

Table 6.8 – Risk Matrix

OCCURRENCE	V.High	5					
	High	4					
	Medium	3					
	Low	2	Risk ID 5				
	V.Low	1		Risk ID 1, 2, 4 and 7	Risk ID 3	Risk ID 6	
			1	2	3	4	5
			Trivial	Minor	Moderate	Major	Massive
SEVERITY							

Where:

Red is a high level risk

Yellow is a medium level risk

Green (light and dark) is a low level risk

The control measures and monitoring techniques employed at the site to deal with the risks identified were deemed adequate and these risks remain unchanged, however, this does not take away the need for continuing awareness and monitoring on a regular basis of these risks.

6.5.1. Quantification of Unknown Environmental Liabilities

The costs associated with the known environmental liabilities (e.g. closure and aftercare costs) for the Enva facility were calculated through the preparation and costing of the

Closure, Restoration, Aftercare Management Plan (refer to Site Specific CRAMP prepared for Enva).

For the unknown liabilities identified in this report a financial model is necessary to estimate the environmental liability associated with these risks.

Each Risk has two characteristics that are derived from the Risk Classification Tables

(See tables 6.2 and 6.3) that is used in the financial models:

- The range in probability (X-Y%) of the risk occurring
- The range in cost implications (€A-B) if the risk occurs

The requirements of the financial model must first be defined in terms of worst, most likely or best case scenarios. If the model is for the worst case scenario, then the higher end of each range is used in the calculations, if the model is for the most likely case then the median of each range is used and similarly if the best case scenario is required then the lower end of each range is used resulting in the lowest cost.

The simplest form of financial model can be based on simply multiplying the minimum, median or maximum value of each range for each Risk (depending on the scenario considered) and totalling the values for each Risk in the Register.

For the Enva facility the worst case scenario was calculated. Table 6.10 illustrates how the financial output for the worst case scenario is calculated.

From this, financial instruments for unknown liabilities can be selected as outlined in Section 7 of this report.

Table 6.10 - Worst Case Scenario Financial Model

Risk ID	Potential Hazard	Occurrence Rating	Likelihood of Occurrence Range	Severity Rating	Cost Range (€)	Worst Case Probability	Worst Case Severity (€)	Worst Case Cost (€) Note 1
6	Major Fire/Explosion	1	0-5%	4	50,000-1,000,000	5%	1,000,000	50,000
3	Bund Integrity Failure	1	0-5%	3	50,000 -500,000	5%	500,000	25,000
5	Failure of underground drainage network.	1	5-10%	2	100,000- 250,000	10%	250,000	25,000
1	Spill from loading/unloading operations.	1	0-5%	2	10,000 – 50,000	5%	50,000	2,500
2	Bulk Storage tank failure.	1	0-5%	2	10,000-50,000	5%	50,000	2,500
4	Improper disposal of hazardous waste.	1	0-5%	2	100,000 – 500,000	5%	500,000	25,000
7	Failure of on-site environmental control procedures.	1	0-5%	2	100,000 - 500,000	5%	500,000	25,000
Total worst-case cost of unknown liabilities								155,000

Note 1: The financial provision was estimated using the guidance document provided by the EPA. It is noted that this is an estimated cost potential based on estimated probability of a risk occurring and estimated magnitude of any resulting environmental liability. It is the opinion of Enva that liabilities in excess of the total shown on the table above could conceivably occur and that consequently financial provision in excess of this figure will be maintained by the site.

7. FINANCIAL PROVISIONS

In the preceding sections the site sensitivity, known historic environmental liabilities and the measures, both technical and managerial, currently in place to eliminate/reduce the risk of new environmental liabilities arising have been summarised.

It can be concluded that the site environmental and safety management system are robust in terms of preventing the development of any new significant off-site environmental liability.

In the these sections, we will discuss the financial provisions at the site and whether these provisions are adequate to satisfactorily address the liabilities identified in section 6.

7.1. Current Financial Provisions

Enva is a wholly owned subsidiary of DCC. DCC was founded, and listed on the Irish and London stock exchanges in 1994. DCC is headquartered in Ireland and currently employs approximately 7,200 people

DCC maintain various insurance policies, which provide a range of cover subject to certain exclusions, excess and warranties. These insurance policies provide a range of cover for all DCC sites, subsidiaries or associated companies. There are a number of policies which provide cover for the following risks:

- Employers liability
- Public/Products Liability;
- Motor Insurance;
- Engineering Combined.

The public/products liability provides indemnity in respect of legal liability for accidental bodily injury to any person or accidental loss or damage to property arising from the performance of the contract work (i.e. activities undertaken by Enva as defined in the Insurance policy). The policy has a limit of indemnity of €13,000,000. The policy is subject to an excess of €15,000 each and every claim.

The policy provides limited cover in respect of pollution or contamination risks in that cover is only provided where same has been caused by a sudden identifiable unintended and unexpected incident which takes place in its entirety at a specific time and place during the period of insurance. The liability of the underwriter for all damages and compensation payable in respect of all Pollution or Contamination which is deemed to have occurred during the period of insurance shall not exceed €13,000,000.

7.2. Assessment of Enva Financial Provision

The environmental liabilities identified and assessed in this report (refer to Section 6) are in the main unforeseen or unanticipated events that could occur suddenly as a result of an accident or failure of control systems. Other liabilities identified are the result of gradual and unforeseen discharge consequent upon failure of control systems, which may result in a discharge to the environment such as leaking drains or undetected leaks in drainage systems.

Having consideration for the worst-case costs calculated in Table 6.10, a comparison of existing financial provisions presented in Section 7.1 above may be made with the type of unknown liabilities identified at the site.

Risk Type	Existing Enva Financial Provision	Comment
Immediate, sudden and unforeseen discharge consequent upon an accident.	DCC UK and Ireland Insurance policies Insurance - Public/Products Liability	Each claim has an excess of €15,000 which must be paid by Enva.
Gradual unforeseen discharge consequent upon failure of control systems.	Financed internally by DCC and/or Enva funds.	Unlikely that these are included within the current insurance cover for the site. Potential liabilities which arise that are not covered under existing insurance policies would be paid for with Enva based funds.
Closure Restoration and Aftercare Liabilities	Financed internally by DCC and/or Enva funds.	Enva have completed a Closure, Restoration, Aftercare Management Plan for the site with a specified total cost of €413,602 for effective site closure and aftercare. This document will be reviewed annually by enva

Table 7.1 – Assessment of Enva Financial Provision annually by Enva.

Based on a review of the current level of insurance maintained by the site, it appears that environmental liabilities resulting from Risk IDs 1,2,6 and 7 as shown in table 6.10 above would be covered under the existing insurance policies. Indemnity in respect of Risk IDs 3 and 4 would depend on the circumstances, which lead to any potential liability. Liabilities associated with Risk ID 5 would appear to be excluded from the existing cover and therefore any financial liabilities associated with this would need to be financed by Enva.

Appendix 1

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Appendix 15



| PRTR# : W0184 | Facility Name : ENVA Ireland Ltd | Filename : W0184_2009.xls |
Return Year : 2009 |

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AER Returns Worksheet

Version 1.1.10

REFERENCE YEAR	2009
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1. FACILITY IDENTIFICATION

Parent Company Name	ENVA Ireland Ltd
Facility Name	ENVA Ireland Ltd
PRTR Identification Number	W0184
Licence Number	W0184-01

Waste or IPPC Classes of Activity

No.	class_name
4.8	Oil re-refining or other re-uses of oil.
3.12	Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
3.6	Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule.
3.7	#####
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.12	Exchange of waste for submission to any activity referred to in a preceding paragraph of this Schedule.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.4	Recycling or reclamation of other inorganic materials.
4.5	Regeneration of acids or bases.
4.9	Use of any waste principally as a fuel or other means to generate energy.
Address 1	Clonminam Industrial Estate
Address 2	Portlaoise
Address 3	County Laois
Address 4	
Country	Ireland
Coordinates of Location	-7.31391 53.0294
River Basin District	IESE
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	Anne Phelan
AER Returns Contact Email Address	aphela@enva.ie
AER Returns Contact Position	Health, Safety & Environmental Manager
AER Returns Contact Telephone Number	0578678600
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	0578678699
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
5(a)	Installations for the recovery or disposal of hazardous waste
5(c)	Installations for the disposal of non-hazardous waste
50.1	General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	No
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 ?	

4.1 RELEASES TO AIR

[PRTR# : W0184 | Facility Name : ENVA Ireland Ltd | Filename : W0184_2009.xls | Return Year : 2009 |

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SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR								
POLLUTANT		METHOD			QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Method Used Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
08	Nitrogen oxides (NOx/NO2)	M	ALT	BS ISO 9096:2003 &EPA Stack monitoring guidance	51.0	51.0	0.0	0.0
					0.0	0.0	0.0	0.0
11	Sulphur oxides (SOx/SO2)	M	ALT	BS ISO 9096:2003 &EPA Stack monitoring guidance	2.3	2.3	0.0	0.0
02	Carbon monoxide (CO)	M	ALT	BS ISO 9096:2003 &EPA Stack monitoring guidance	1.2	1.2	0.0	0.0

* 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								
POLLUTANT		METHOD			QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Method Used 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

* 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								
POLLUTANT		METHOD			QUANTITY			
Pollutant No.	Name	M/C/E	Method Code	Method Used 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

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill:	ENVA Ireland Ltd				
Please enter summary data on the quantities of methane flared and / or utilised	T (Total) kg/Year	M/C/E	Method Used Method Code Designation or Description		Facility Total Capacity m3 per hour
	Total estimated methane generation (as per site model)	0.0			N/A
	Methane flared	0.0			0.0 (Total Flaring Capacity)
	Methane utilised in engine/s	0.0			0.0 (Total Utilising Capacity)
	Net methane emission (as reported in Section A above)	0.0			N/A

4.2 RELEASES TO WATERS

| PRTR#: W0184 | Facility Name : ENVA Ireland Ltd | Filename : W0184_2009.xls | Return Year : 2009 |

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SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as this only concerns Releases from your facility

RELEASES TO WATERS							
POLLUTANT		Method Used			QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* 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							
POLLUTANT		Method Used			QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* 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							
POLLUTANT		Method Used			QUANTITY		
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.3 RELEASES TO WASTEWATER OR SEWER

| PRTR# : W0184 | Facility Name : ENVA Ireland Ltd | Filename : W0184_2009.xls | Return Year : 2 30/03/2010 09:56

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SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER									
POLLUTANT		METHOD			QUANTITY				
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
			Method Code	Designation or Description					
06	Ammonia (NH3)	M	PER	Standard methods	206.1	206.1	0.0	0.0	
79	Chlorides (as Cl)	M	PER	Standard methods	14235.95	14235.95	0.0	0.0	
71	Phenols (as total C)	M	PER	Standard methods	78.41	78.41	0.0	0.0	
13	Total phosphorus	M	PER	Standard methods	495.25	495.25	0.0	0.0	
20	Copper and compounds (as Cu)	M	PER	Standard methods	0.28	0.28	0.0	0.0	
18	Cadmium and compounds (as Cd)	M	PER	Standard methods	0.1	0.1	0.0	0.0	
23	Lead and compounds (as Pb)	M	PER	Standard methods	0.77	0.77	0.0	0.0	
24	Zinc and compounds (as Zn)	M	PER	Standard methods	1.3	1.3	0.0	0.0	

* 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									
POLLUTANT		METHOD			QUANTITY				
Pollutant No.	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
			Method Code	Designation or Description					
314	Fats, Oils and Greases	M	PER	Standard methods	340.02	340.02	0.0	0.0	
343	Sulphate	M	PER	Standard methods	1631.79	1631.79	0.0	0.0	
306	COD	M	PER	Standard methods	24306.5	24306.5	0.0	0.0	
240	Suspended Solids	M	PER	Standard methods	769.84	769.84	0.0	0.0	
					0.0	0.0	0.0	0.0	

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.4 RELEASES TO LAND

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND							
POLLUTANT		METHOD			QUANTITY		
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
			Method Code	Designation or Description			
					0.0	0.0	0.0

* 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							
POLLUTANT		METHOD			QUANTITY		
Pollutant No.	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
			Method Code	Designation or Description			
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

| PRTR#: W0184 | Facility Name : ENVA Ireland Ltd | Filename : W0184_2009.xls | Return Year : 2009 |

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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 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	17 05 04	No	707.74	Soil	D1	M	Weighed	Offsite in Ireland	KTk Landfill , W081-2 Hinch Plant hire ,WFP-LS-09-0002-01	Brownstown and Carnalway ,Kilcullen ,Co. Kildare ,Ireland Straboe , , Portlaoise ,Co Laois,Ireland		
Within the Country	17 05 04	No	9862.32	Soil	D1	M	Weighed	Offsite in Ireland				
To Other Countries	16 01 07	Yes	742.76	Oil Filters	R12	M	Weighed	Abroad	RD Recycling ,OVAM Authorised	Centrum Zuid 3017 , ,3530,Belgium	RD Recycling ,OVAM Authorised, Centrum Zuid 3017 , ,3530,Belgium	Centrum Zuid 3017 , ,3530,Belgium
To Other Countries	16 06 01	Yes	2569.08	Lead acid Batteries	R4	M	Weighed	Abroad	Campine,Ovam Approved	Nilverheidsstraat 2 Belgium, , ,B- 2340 Beerse ,Belgium	Authorised,Nilverheidsstraat 2 , , ,B- 2340 Beerse ,Belgium	Nilverheidsstraat 2 , , ,B- 2340 Beerse ,Belgium
To Other Countries	20 01 21	Yes	10.38	Fluorescent tubes	R4	M	Weighed	Abroad	Dela ,312/220704	Alte Landstraße 4 , ,Essen ,D-45329 ,Germany	Landstraße 4 , , Essen ,D-45329 ,Germany	Alte Landstraße 4 , , Essen ,D-45329 ,Germany
Within the Country	20 01 21	Yes	4.64	Fluorescent tubes	R4	M	Weighed	Offsite in Ireland	Irish Lamp Recycling , WFP-KE-08-0348-01	Woodstock Industrial Estate , ,Athy ,Co. Kildare,Ireland	Irish Lamp Recycling ,WFP-KE-08-0348-01,Woodstock Industrial Estate , ,Athy ,Co. Kildare ,Ireland	Woodstock Industrial Estate , ,Athy ,Co. Kildare ,Ireland
Within the Country	20 01 21	Yes	0.51	Solid Flammable waste	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate , ,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 , ,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 , ,Kreutzal,D57223 ,Germany
To Other Countries	15 02 02	Yes	302.45	Solid Flammable waste	R12	M	Weighed	Abroad	Lindenschmidt , 04 714 98089	Krombacher Strasse 42-46 , ,Kreutzal,D57223 ,Germany	42-46 , ,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 , ,Kreutzal,D57223 ,Germany
To Other Countries	15 02 02	Yes	48.44	Solid Flammable waste	D10	M	Weighed	Abroad	KWA ,498/1713/Efb	Graftstr. 25 , , ,47475 Kamp-Lintfort ,Germany	KWA ,498/1713/Efb,Graftstr. 25 , , ,47475 Kamp-Lintfort ,Germany	Graftstr. 25 , , ,47475 Kamp-Lintfort ,Germany
To Other Countries	16 06 02	Yes	30.04	Nickel Cadmium Batteries	R4	M	Weighed	Abroad	Accurec ,ZUUM-054-0499-45-40-1103	Wiehagen 12-14 , , ,45472 Mulheim an der Ruhr,Germany	45-40-1103, Wiehagen 12-14 , , ,45472 Mulheim an der Ruhr,Germany	Wiehagen 12-14 , , ,45472 Mulheim an der Ruhr,Germany
Within the Country	08 01 11	Yes	3.15	Paint and Thinners	R1	M	Weighed	Onsite in Ireland	Enva ,W041-1	Smithstown Industrial estate , ,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 , ,Kreutzal,D57223 ,Germany	Krombacher Strasse 42-46 , ,Kreutzal,D57223 ,Germany
To Other Countries	08 01 11	Yes	57.5	Paint and Thinners	R1	M	Weighed	Abroad	Geocycle ,38.152/BP	Rue de Courriere 49 Zoning Industriel de Feluy , , ,B 7181 Seneffe ,Belgium	Geocycle ,38.152/BP, Rue de Courriere 49 Zoning Industriel de Feluy , , ,B 7181 Seneffe ,Belgium	Rue de Courriere 49 Zoning Industriel de Feluy , , ,B 7181 Seneffe ,Belgium
To Other Countries	08 01 11	Yes	11.56	Paint and Thinners	R2	M	Weighed	Abroad	Enva NI,P0108/05A	No. 11 Comber Rd , Unit 1 ,Carryduff ,Co Down,Ireland	Enva NI,P0108/05A, Comber Rd , Unit 1 ,Carryduff ,Co Down,Ireland	No. 11 Comber Rd , Unit 1 ,Carryduff ,Co Down,Ireland
Within the Country	19 12 03	No	23.84	Hoses	R4	M	Weighed	Offsite in Ireland	MSM Recycling Ltd.,WMP 02/2008	Terminal, Gurteens, Slieverue, Co. Kilkenny,Ireland		
Within the Country	09 01 02	Yes	1.4	Silver from Photographic waste	D9	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate , ,Shannon ,Co. Clare,Ireland	Enva,W041-1,Smithstown Industrial Estate, ,Shannon,Co. Clare,Ireland	Smithstown Industrial Estate, ,Shannon,Co. Clare,Ireland

To Other Countries	16 01 13	Yes	4.48 Brakefluid	R1	M	Weighed	Abroad	KS Recycling ,12 150 13984/01TMS	Raiffeisenstraße 38 ,,,, D- 47665 Sonsbeck ,Germany	KS Recycling ,12 150 13984/01TMS,Raiffeisenstra ße 38 ,,,, D-47665 Sonsbeck ,Germany
To Other Countries	16 05 04	Yes	17.6 Aerosols	R5	M	Weighed	Abroad	SBH ,121296753	Austrabe 5 ,,,,D74238 Krautheim,Germany	Austrabe 5 ,,,,D74238 Krautheim,Germany
Within the Country	16 05 07	Yes	15.28 Discarded Chemicals	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	20 01 27	Yes	4.46 resin	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	15 01 02	No	10.98 Plastic packaging	R5	M	Weighed	Offsite in Ireland	Leinster Environmentals , WP 2008/06	Haggardstown ,,Dundalk ,Co. Louth,,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	17 02 03	No	2.14 Packaging Hard plastic mixed	R5	M	Weighed	Offsite in Ireland	Leinster Environmentals , WP 2008/06	Haggardstown ,,Dundalk ,Co. Louth,,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	19 12 03	No	4.26 Metal Packaging	R13	M	Weighed	Offsite in Ireland	Hegarty Metals , WP 05-04	Ballysimon road ,,Limerick,Co. Limerick,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	15 01 10	Yes	3.5 Packaging	D9	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	13 08 99	Yes	1.0 Oily wastes not otherwise specified	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	20 01 14	Yes	0.04 acids	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	16 05 06	Yes	0.1 Laboratory chemicals consisting of or mixtures containing dangerous substances including	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	16 05 08	Yes	0.18 Discarded organic chemicals consisting of dangerous substances	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	16 01 15	No	24.46 Antifreeze	D9	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
To Other Countries	16 06 05	No	18.18 Mixed Batteries	R4	M	Weighed	Abroad	Accurec ,ZUUM-054-0499- 45-40-1103	Mulheim an der Ruhr,Germany	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	16 05 09	No	0.34 Silica	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	08 03 08	No	0.4 ink	R1	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithstown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	16 01 03	No	0.6 Tyres	R5	M	Weighed	Offsite in Ireland	Crumb Rubber , WP 2007/01	Mooretown ,, Dundalk ,Co Louth,,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
To Other Countries	20 01 25	No	23.4 Used Cooking Oil	R13	M	Weighed	Abroad	BIP ,ZP39358G	Tat Bank Rd. Oldbury ,PO Box 3180 , West Midlands ,B69 4PG ,United Kingdom	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	20 01 25	No	116.3 Used Cooking Oil and Grease Trap Waste	D6	M	Weighed	Offsite in Ireland	Beofs ,WFP-KK-09-0004-01	Camphill Community Ballytobin ,,Callan ,Co. Kilkenny,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany
Within the Country	20 01 25	No	1.73 Used Cooking Oil	D9	M	Weighed	Offsite in Ireland	Enva ,W041-1	Smithtown Industrial estate ,,Shannon ,Co. Clare,Ireland	98089,Krombacher Strasse 42-46 ,,Kreutzal,D57223 ,Germany

Within the Country	20 01 25	No	1.13 Used Cooking Oil	R1	M	Weighed	Offsite in Ireland	Agri Energy/AIBP ,204	Kilcommon ,,, Cahir ,Co Tipperary,,Ireland	
To Other Countries	13 05 02	Yes	158.6 Sludge	R1	M	Weighed	Abroad	Geocycle ,38.152/BP	Rue de Courriere 49 Zoning Industrial de Feluy ,,,,B 7181 Seneffe ,Belgium	Geocycle ,38.152/BP, Rue de Courriere 49 Zoning Industrial de Feluy ,,,,B 7181 Seneffe ,Belgium KS Recycling ,12 150 13984/01TMS,Raiffeisenstra ße 38 ,,,, D-47665 Sonsbeck Raiffeisenstraße 38 ,,,, D- 47665 Sonsbeck ,Germany
To Other Countries	13 07 03	Yes	103.6 Mixed Fuels	R1	M	Weighed	Abroad	KS Recycling ,12 150 13984/01TMS	Raiffeisenstraße 38 ,,,, D- 47665 Sonsbeck ,Germany Belview Bulk	
Within the Country	19 12 03	No	45.04 Metal Packaging	R4	M	Weighed	Offsite in Ireland	MSM Recycling Ltd.,WMP 02/2008	Terminal, Gurteens,Slieverue, Co. Kilkenny,Ireland Cookstown Industrial Estate ,Unit 41,Tallaght ,Dublin 24,Ireland	
Within the Country	19 12 03	No	5.22 Hoses	R4	M	Weighed	Offsite in Ireland	MSM Recycling , W079-1	Cappincur Industrial Estate Daingean Rd. ,,,Tullamore ,Co. Offaly,,Ireland	Jean Goldschmidt,DDT14- R1.2/15-97- 22,,,,,,Brussels,Belgium ,,,,,Brussels,Belgium
Within the Country	06 05 02	Yes	22.0 Waste metal filter cake	R4	M	Weighed	Offsite in Ireland	KMK ,W0113-03		

* Select a row by double-clicking the Description of Waste then click the delete button

Appendix 16

Certificate IE00/51683

SGS

The management system of

Enva Ireland Limited, A division of DCC Environmental

Smithstown Industrial Estate, Shannon, Co Clare, Ireland

Clonminam Industrial Estate, Portlaoise, Co. Laois, Ireland

JFK Road, Naas Road, Dublin 12, Ireland

Raffeen Industrial Estate, Ringaskiddy, Co. Cork, Ireland

has been assessed and certified as meeting the requirements of

ISO 14001:2004

For the following activities

Hazardous and non-hazardous waste management, treatment, recovery
and associated site services. Operation of waste transfer stations.
Manufacture and supply of waste water treatment products and services.
Supply of drain cleaning and survey services. Blending according to
customer specification.

This certificate is valid from 02 July 2007 until 02 July 2010 and
remains valid subject to satisfactory surveillance audits.
Re certification audit due before 15 June 2010
Issue 6. Certified since 30 June 2000

Authorised by

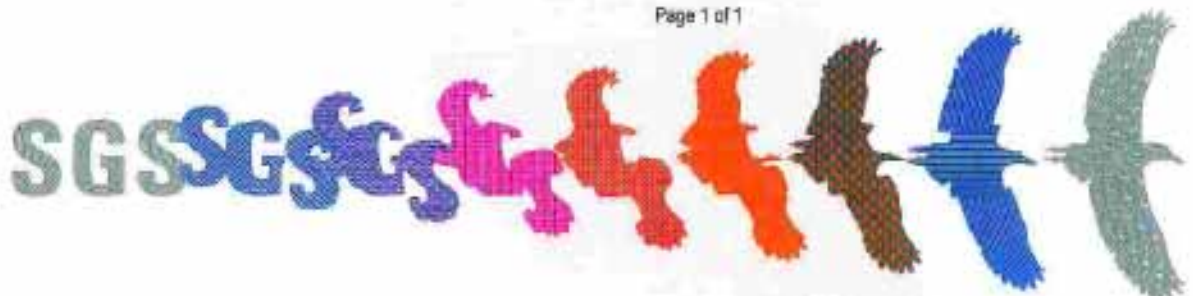
SGS United Kingdom Ltd Systems & Services Certification
Rosemore Business Park, Ellesmere Port, Cheshire CH65 3EN UK
t +44 (0)151 350-8886 f +44 (0)151 350-6000 www.sgs.com

SGS EMS 04 0306

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Appendix 17



Enva Ireland Ltd
Raffeen Ind Est, Ringaskiddy, Co.Cork

Tel: 021 438 7300
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Email: cork@enva.ie

RESPIROMETRY REPORT

ENVA Portlaoise

A sample was received on 17.06.09 from Enva Portlaoise for evaluation of its effect on activated sludge micro organisms. The methodology for this is by respirometry, which assesses the oxygen uptake of a standard activated sludge versus sludge containing the sample for evaluation, over a 30-minute period. The sample submitted was as follows:

Sample	Sludge Portlaoise June 2009
--------	-----------------------------

The result was as follows: (all results mg/l O₂)

Sample Time/Mins.	Control	Sample ¹ / ₁₀₀ Dilution	Sample ¹ / ₅₀ Dilution	Sample ¹ / ₁₀ Dilution
0	8.7	7.7	8.4	8.3
1	7.1	6.5	6.5	6.7
2	6.6	6.3	6.5	6.5
3	6.4	6.1	6.3	6.4
4	6.2	5.9	6.1	6.2
5	6.0	5.7	5.9	6.2
10	4.9	4.9	5.1	5.2
15	4.1	4.0	4.2	4.4
20	3.2	3.0	3.4	3.7
25	2.4	2.2	2.6	2.9
30	1.6	1.4	1.8	2.1
% Inhibition		11%	7%	12%

Only samples showing +30% or greater inhibition are considered to have a negative effect on the activated sludge.

As we can see the sample is lower than +30% so this indicates that there was no inhibition of the activity of the activated sludge micro organisms.

Signed:

Greg

Date: 08/21/09

Approved:

Amu

0214962345



Enva Ireland Ltd
Raffeen Ind Est, Ringaskiddy, Co.Cork

Tel: 021 438 7200
Fax: 021 438 7299
Email: cork@enva.ie

RESPIROMETRY REPORT **ENVA Portlaoise**

A sample was received on 16.11.09 from Enva Portlaoise for evaluation of its effect on activated sludge micro organisms. The methodology for this is by respirometry, which assesses the oxygen uptake of a standard activated sludge versus sludge containing the sample for evaluation, over a 30-minute period. The sample submitted was as follows:

Sample	Sludge Portlaoise November 2009
--------	---------------------------------

The result was as follows: (all results mg/l O₂)

<i>Sample Time/Mins.</i>	<i>Control</i>	<i>Sample 1/2 Dilution</i>
0	9.5	8.8
1	6.7	5.1
2	6.4	4.9
3	6.1	4.6
4	5.9	4.3
5	5.7	3.9
10	4.8	2.3
15	4.0	0.7
20	3.2	0
25	2.3	
30	1.5	
% Inhibition		-10%

Only samples showing +30% or greater inhibition are considered to have a negative effect on the activated sludge.

As we can see the sample is lower than +30% so this indicates that there was no inhibition of the activity of the activated sludge micro organisms.

Signed:

Date:

3/3/10

Approved:

Appendix 18

Waste streams accepted on site 2004-2008 *Note 1*

Waste Type	EWC Code	Quantities Accepted 2004	Quantities Accepted 2005	Quantities Accepted 2006	Quantities accepted. 2007
Ni-Cd batteries	16 06 02*	0	2.52	14.33	4.81
Alkaline batteries	16 06 04	0	34.49	0	0
Mixed batteries	20 01 34	0	12.44	13.17	47.92
Fluorescent tubes	20 01 21*	0.3451	3.53	48.565	70.573
Hoses	13 08 99*	18.38	28.44	50.16	28.59
Antifreeze	16 01 15	2.43	6.16	12.412	9.09
Aerosols	16 05 05	0.03	0.56	6.81	3.93
Waste Paint mixtures	08 01 11*	0	11.57	61.95	76.58
Photographic waste	09 01 99*	0	1.99	3.6575	2.05
Aqueous waste	13 05 07*	0	0	4.56	11.88
Mixed Fuels	13 07 03*	16.88	28.16	47.8019	58.399
Other Fuels	13 07 03*	0	0	7.12	0
Brake fluid	16 01 13*	0	0.72	2.0973	5.46
Packaging contaminated with residues	15 01 10*	0	29.44	367.56	84.51
Plastic packaging contaminated with residues	15 01 10*	0	2.64	2.19	0
Vegetable Oil	20 02 25	0	509.22	636.99	1363.98
Obsolete Bleach	06 02 05*	0	0	0	0.2
Bleach	20 01 30	0	0	0	0.15
Glycol oil mixture	16 01 15	0	0	0	3.6
Obsolete Ferric Sulphate	19 09 99	0	0	0	0.325
Spent toner cartridges	15 01 10*	0	0	0	0.075
Drums with resin	15 01 10*	0	0	0	0.41
Metal containers	15 01 10*	0	0	0	8.96

Waste Type	EWC Code	Quantities accepted 2008
Ni-Cd batteries*	16 06 02*	31.86
Other batteries and accumulators	16 06 05	45.97
Fluorescent tubes*	20 01 21*	89.9
Hoses	13 08 99*	29.58
Antifreeze	16 01 15	18.47
Aerosols	16 05 05	15.72
Waste Paint mixtures	08 01 11*	68.084
Mixed Fuels	13 07 03*	67.133
Brake fluid	16 01 13*	5.28
Packaging contaminated with residues*	15 01 10*	152.83
Vegetable Oil	20 02 25	1011.588
Glycol oil mixture	16 01 15	2
Hydrochloric acid	06 01 02*	0.84
Silver	09 01 01*	3.175
Non Liquid solvent waste	14 06 05*	0.2

Note 1: The above tables include the volumes of waste streams accepted on site between 2004-2008 excluding waste oil, contaminated soil, lead acid batteries and solid oily waste Volumes. Waste oil, contaminated soil, lead acid batteries, solid oily waste and filter quantities are included in the main body of the AER.

Appendix 19

Waste Volumes Sent Off Site For 2008

Waste	EWC Codes	Destination Used in 2008	Quantities transferred off – site 2008
Sludges	13 05 02*	Geocycle, Belgium	154.010
Solid flammable waste	15 02 02*	Lindenschmidt, Germany.	690.22
Batteries (lead acid)	16 06 01*	Campine	1835.63
Filters	16 01 07*	RD Recycling	1084.36
Fluorescent tubes	20 01 21*	Dela	55.57
Hoses	13 08 99	Hegarty Metal Recycling	29.58
Antifreeze	16 01 15	Enva, Smithstown, Shannon, Co.Clare	17.85
Aerosols	16 05 05	SBH	8.42
Paint thinners	08 01 11*	Enva NI, Drumaness, Co. Down.	41.25
Mixed Fuels	13 07 03*	KS Recycling	109.52
Brake fluid	16 01 13*	Enva, Smithstown, Shannon, Co.Clare	Included in figure for mixed fuels
Soil	17 05 04	KTK	631.86
	17 05 04	Hinch	12925.36
	17 05 03*	Sita Holland	12500.16
Stone	17 05 04	Re-use as fill material.	7424.48
Veg oil	20 01 25	BIP	856.38
NiCad batteries	16 06 02*	Accurec	15.02
Packaging Contaminated with dangerous residues	15 01 10*	Hegarty Metal	100.19
Packaging Contaminated with dangerous residues	15 01 10*	Enva, Smithstown, Shannon, Co.Clare	11.73
Empty Packaging	15 01 02	Leinster Environmental	11.58
Non Liquid Solvent Waste	14 06 05*	Enva, Smithstown, Shannon, Co.Clare	0.2
Hydrochloric Acid	06 01 02*	Enva, Smithstown, Shannon, Co.Clare	1.43
Other batteries and accumulators	16 06 05	Accurec	46.96
Silver	09 01 01*	Enva, Smithstown, Shannon, Co.Clare	3.85

Waste Volumes Sent Off Site 2004-2007

Waste	EWC Codes	Destination Used	Quantities Transferred Off-Site			
			2004	2005	2006	2007
Sludges	13 05 02*	Geocycle, Belgium	Included in figure for solid oily wastes	63.04	272.39	3.66
Solid oily waste	15 02 02*	Lindenschmidt, Germany.	857.73	795.76	931.23	637.03
Aqueous waste	13 01 13*	Enva, Shannon	n/a	n/a	n/a	11.88
Batteries	16 06 01*	Enthoven	258	493.74	n/a	n/a
Batteries (lead acid)	16 06 01*	Campine	This facility was not used	422.65	1683.94	1810.49
Batteries (mixed)	20 01 34	Accurec	n/a	n/a	17.97	52.73
Filters	16 01 07*	RD Recycling	540.04	501.49	602.54	676.82
Fluorescent tubes	20 01 21*	Dela	n/a	n/a	59.85	71.04
Hoses	13 08 99	Hegarty Metal Recycling	18.38	6.06	50.16	28.59
Antifreeze	16 01 15	Enva, Smithstown, Shannon, Co.Clare	n/a	6.16	12.412	9.09
Aerosols	16 05 05	Enva, Smithstown, Shannon, Co.Clare	n/a	0.56	6.81	4.30
Paint thinners	08 01 11*	Enva, Smithstown, Shannon, Co.Clare	n/a	11.57	29.51	n/a
Paint thinners	08 01 11*	Enva NI, Drumaness, Co. Down.	n/a	n/a	32.44	39
Photographic waste	09 01 99*	Enva, Smithstown, Shannon, Co.Clare	n/a	1.99	3.6575	2.05
Waste oil	13 07 03*	Enva NI, Drumaness, Co. Down	n/a	n/a	103.34	n/a
Mixed Fuels	13 07 03*	KS Recycling	21.9	41.9	44.48	56.39
Brake fluid	16 01 13*	Enva, Smithstown, Shannon, Co.Clare	n/a	0.72	2.0973	n/a
Steel drums	15 01 10*	Hegarty Metal Recycling	45.58	22.06	367.56	67.72
Plastic Drums	16 01 10*	Enva, Smithstown, Shannon, Co.Clare	n/a	2.64	2.19	1.03
Soil	17 05 04	Murphy Environmental - Hollywood	n/a	10737.34	4691.96	2967.4
	17 05 04	Murphy Environmental - Gormanstown	n/a	6685.31	n/a	n/a

	17 05 04	KTK	n/a	7240.8	20153.97	10261.24
	17 05 04	Hinch	n/a	n/a	5726.93	19445.41
	17 05 03*	Sita Holland	11953.6	5145	1451.54	n/a
	17 05 04	Sheils quarry	n/a	n/a	n/a	117.6
	17 05 03*	Terracon	n/a	n/a	10236.65	5200.8
Stone	17 05 04	Re-use as fill material.	3490.48	15653.75	6299.48	8984.79
Veg oil	20 01 25	Argent, Scotland	n/a	509.22	1120.35	723.92
	20 01 25	BIP	n/a	n/a	n/a	348.39