

CERTIFICATE OF AUTHORISATION APPLICATION

COA Attachment

IBR1266 Dunkineely Landfill
Final
21 June 2021

REPORT

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
Final	COA	AMcGinley	Donal Doyle	Donal Doyle	21/06/2021

Approval for issue

Donal Doyle

21 June 2021

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1 ATTACHMENT A1- NON TECHNICAL SUMMARY

1.1 The site location.

The landfill site is situated in a rural area in the townland of Bogside near the Village of Dunkineely Co. Donegal at Grid Reference 176928E, 376420N. The land is owned by Donegal County Council. The site is enclosed by stock proof fencing to all boundaries. Access to site is via a stock proof gate from the regional road which runs along the northern and eastern boundaries. The eastern portion of the site is bounded by an embankment which is overgrown with trees and scrub vegetation. There are a number of residential properties to the northern and southern boundaries of the site. A drainage ditch runs along the western boundary but no connection from this ditch to stream or river was found. There is a stream running along the regional road to the northern boundary of the site. The surrounding land consists mainly of grass and bogland and is being used for grazing.

1.2 A brief history of the site, types and volumes of waste deposited, duration of disposal activities and date of cessation.

The site is owned by Donegal County Council and was in operation from 1975 until 1983 accepting municipal waste. Due to the historical nature of the landfilling, there were no available information on the filling operations undertaken at the site.

No evidence of waste was encountered at any of the boreholes during the main site investigation works. During the Tier 2 preliminary site investigation works, waste material was evident on the surface at the locations of TP03A and TP06, with little evidence of surface waste at the location of TP04. Waste material was encountered at a maximum depth of 1.0m bgl in TP03A during this preliminary investigation. Given the evidence from borehole and trial pit logs, the area of the waste body is estimated to be 0.07 hectares. Based on the maximum depth of 1.0m bgl, the volume of waste material beneath the site is estimated to be 700m³. In accordance with the EPA Code of Practice, waste tonnages should be calculated with the conversion table set out in Schedule 1 to the Waste Management (Landfill Levy) Regulations 2015 (SI No 189 of 2015). As the waste falls into either the "Household waste – not compacted" or "Household waste – compacted (includes all bulk disposals" categories, the higher conversion factor of 0.4 cubic metres to tonnes was used in accordance with the regulations. This equates to 280 tonnes of waste.

1.3 The hydrogeology and ecology of the site and surrounding area, to include protected areas.

1.3.1 Hydrogeology

The GSI online bedrock map of Ireland classifies the bedrock underlying the eastern portion and embankment area of the site as a regionally important karstified aquifer (Rk). The west of the site and surrounding area is underlain by a locally important (Lm) aquifer which is moderately productive.

Groundwater within the site and surrounding area has been classified as extreme vulnerability due to the exposed bedrock at the surface (see Figure 6). Groundwater flow across the site is generally expected to follow the topography and flow in a west to north-westerly direction.

A field drain is located along the western boundary of the site however it does not appear that this drain connects to any stream or river. The nearest surface water feature is an unnamed stream located approximately 300m west of the site. The unnamed stream flows in a south-west direction for approximately 1.5km and discharges into McSwines Bay. The nearest named watercourse is the Bunlacky River which is located approximately 1km east of the site. The river is located upstream of the site and would therefore not be a recipient of run-off from the site.

1.3.2 Ecology

There are no areas of protection on site. St Johns Point pNHA and SAC, Donegal Bay SPA are all located greater than 1km from the site. There are no groundwater dependent terrestrial ecosystems within 1km of

the site. Corine data indicates that the site is located on pastures. These are shown in Appendix A Drawings of Tier 1 Environmental Risk Assessment report.

The assessment concludes that no adverse effect upon the integrity of any European site will occur. Should the correct monitoring and treatment procedures to ensure the proposed ELVs are achieved are undertaken, the waterbodies downstream of the site will not be at risk of deterioration or achieving their WFD status.

On the basis of these findings, it is concluded that the proposed discharge:

- (i) is not directly connected with or necessary to the management of a Natura 2000 site

and

- (ii) will not have significant effects on the conservation objectives of the qualifying habitats and species of the River Bogside_010 water body, or the downstream St. John's Point SAC and Inishduff SPA provided proposed discharge ELVs are adhered to.

1.4 Risk category of the site

Although the site is classified as Moderate Risk (Class B) from the scoring matrix, an analysis of the laboratory results and revised CSM indicates that the risk to the Karst aquifer is Low.

1.5 Actual and potential environmental impacts.

An environmental risk assessment has been carried out with respect to an historic landfill. The assessment was undertaken in accordance with the EPA Code of Practice for Environmental Risk Assessment of Unregulated Waste Disposal Sites, 2007, and comprised Tier 1 Preliminary Assessment and Screening; Tier 2 Exploratory Site investigation and Testing, and Tier 3 Conceptual Model Refinement and Generic Quantitative Risk Assessment. The assessment has concluded the following:

- Chemical analysis of soil results indicated that all samples recorded contaminant concentrations below generic screening values for a commercial end use.
- Chemical analysis of groundwater samples indicated that the shallow groundwater beneath the waste body has been impacted by Ammoniacal Nitrogen, Chloride, Hydrocarbons and PAHs.
- The deep groundwater in the bedrock aquifer has not been impacted by Hydrocarbons and PAHs. Elevated levels of Ammoniacal Nitrogen were detected in both upstream and downstream samples which indicates that these levels are naturally occurring.
- Chemical analysis of upstream and downstream surface water samples indicates that the adjacent surface water receptor has not been impacted by Hydrocarbons and PAHs.
- The laboratory results indicate that the impacted shallow groundwater beneath the waste body is not impacting upon the adjacent surface water receptor and the risk to surface water quality is low.
- Levels of Methane were recorded to be low whilst slightly elevated levels of Carbon Dioxide were detected. The risk to the adjacent residential receptor is deemed to be low due to the lack of a significant horizontal and vertical migration pathway.

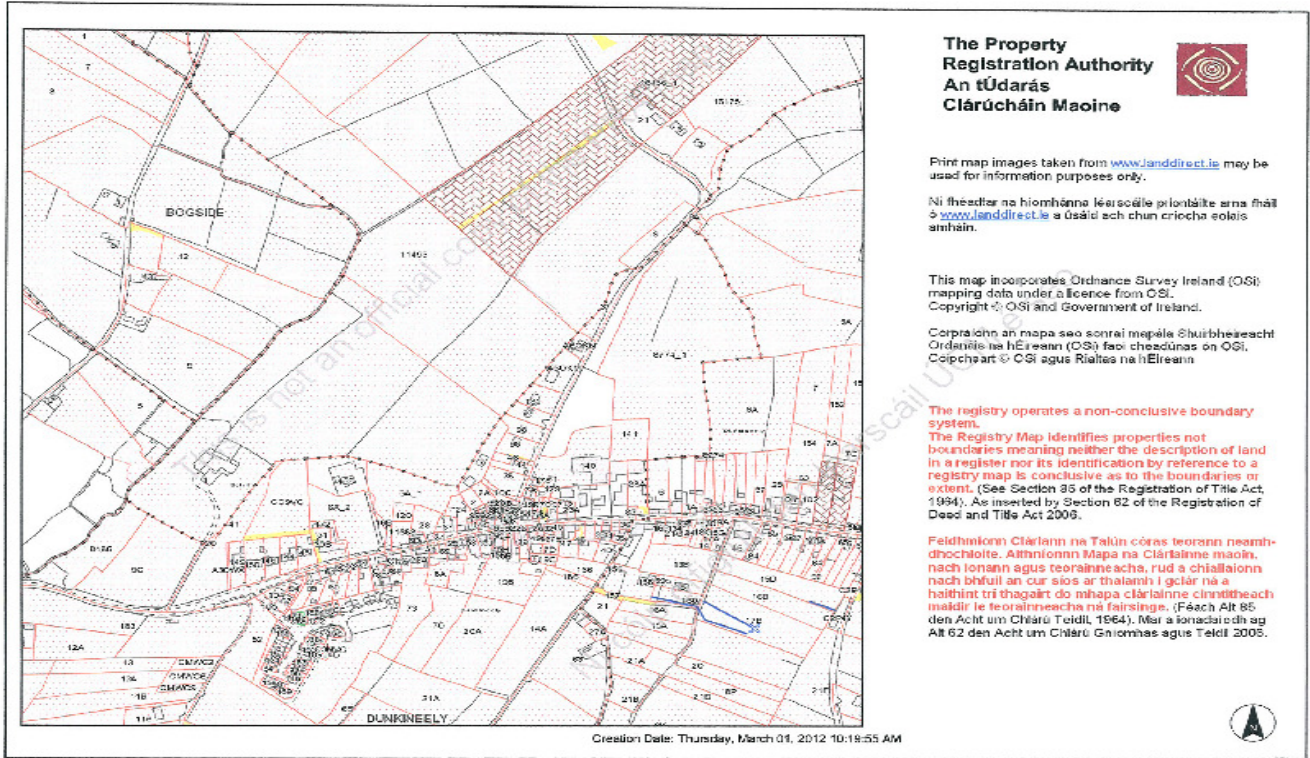
1.6 Proposed remediation including timescale.

As the risk to surface water quality is Low, no remedial measures are required other than the decommissioning of boreholes upon agreement with the EPA. The removal of visible surface waste is recommended as the field immediately adjacent to the council owned land is used for grazing livestock.

2 ATTACHMENT B

2.1 Attachment B1 - Land Ownership Maps

The site is owned by Donegal County Council. Land registry records confirm that this area is in the ownership of Donegal County Council.



3 ATTACHMENT C

3.1 Site Location

The site boundary is shown on Drawing IBR1266/121 Site Location (Appendix A)

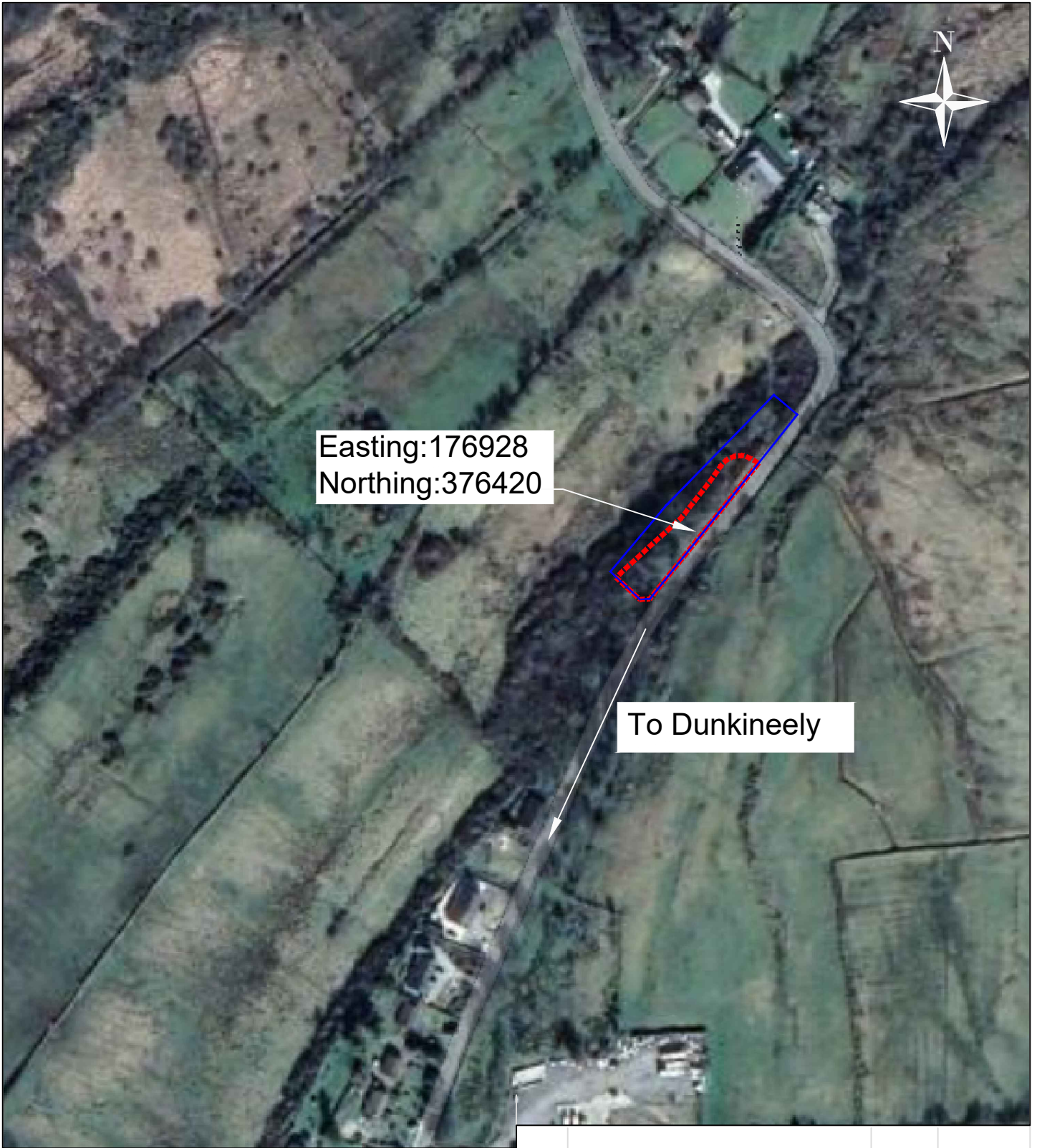
3.2 Attachment C.4 Land use

The eastern portion of the site is bounded by an embankment which is overgrown with trees and scrub vegetation. The site is currently not used.

3.3 Attachment C.5. Types and quantities of waste deposited

No evidence of waste was encountered at any of the boreholes during the main site investigation works. During the Tier 2 preliminary site investigation works, waste material was evident on the surface at the locations of TP03A and TP06, with little evidence of surface waste at the location of TP04. Waste material was encountered at a maximum depth of 1.0m bgl in TP03A during this preliminary investigation. Given the evidence from borehole and trial pit logs, the area of the waste body is estimated to be 0.07 hectares. Based on the maximum depth of 1.0m bgl, the volume of waste material beneath the site is estimated to be 700m³. In accordance with the EPA Code of Practice, waste tonnages should be calculated with the conversion table set out in Schedule 1 to the Waste Management (Landfill Levy) Regulations 2015 (SI No 189 of 2015). As the waste falls into either the “Household waste – not compacted” or “Household waste – compacted (includes all bulk disposals” categories, the higher conversion factor of 0.4 cubic metres to tonnes was used in accordance with the regulations. This equates to 280 tonnes of waste.

Appendix A Drawing



Key:

- ■ ■ ■ ■ Approximate Boundary of Waste
- — — — — Land Ownership Boundary

rev	amendments	drawn	date
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	Client <h3 style="margin: 0;">Donegal County Council</h3>	Title <h3 style="margin: 0;">Dunkineely Site Location</h3>					
Project <h3 style="margin: 0;">IBR1266 Donegal Historic Landfills</h3>							
Project No. IBR1266	Sheet Size A4	Drawing Scale 1:2500	Drawing Status Preliminary	Drawn By MC	Checked By AMcG	Approved By AMcG	Date 18/06/2021

4 ATTACHMENT D

4.1 Attachment D.1.Risk Assessment

RPS

Dunkineely, Historic Landfill Dunkineely, Co. Donegal

Tier I Assessment

IBR0374 / September 2012





**DUNKINEELY
HISTORICAL DISPOSAL SITE
TIER 1**

DOCUMENT CONTROL SHEET

Client	Donegal County Council					
Project Title	Dunkineely Historical Disposal Site					
Document Title	Dunkineely Tier 1					
Document No.	IBR0374/Reports					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	16	1	1	1

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
	Draft	A McGinley	A McGinley	D Doyle	Letterkenny	02/07/12
	Final	A McGinley	A McGinley	D Doyle	Letterkenny	07/09/12

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APPENDIX A DRAWINGS

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- IBR0374/100 Conceptual Site Model
- GSI Groundwater Well Map
- GSI Groundwater Vulnerability Map
- GSI Bedrock Aquifer Map
- GSI Teagasc Subsoil Map
- National Heritage Area
- SPA Area
- Corine Data 2006
- Drinking Water Supply Locations

1.0 INTRODUCTION

1.1 OVERVIEW

RPS Consulting Engineers has been requested by Donegal County Council to undertake a Tier 1 assessment of an unregulated Historical Disposal Site in the townland of Dunkineely, Co. Donegal.

The following initial Conceptual Site Model and Risk Screening Exercise has been undertaken in accordance with the Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites (2007) by the EPA.

This report should be read in conjunction with Code of Practice, Environmental Risk Assessment for Unregulated Waste Disposal Sites (2007) by the EPA.

The initial risk screening process allows for the prioritisation of sites into high, moderate and low risk and represents an assessment of the source-pathway-receptor (S-P-R) linkages in the conceptual model. A Tier 1 Risk assessment was undertaken using EPA web based data management system which provides an online tool for completing the Tier 1 Risk Assessment. The rationale for the allocated scoring for the source - hazard for the eleven possible S-P-R linkages is presented in Table 1.1 based on the tables provided in Section 4.3 of the EPA Code of Practice. Individual S-P-R linkages scores are then normalised to a rating of 100 by dividing the linkage score by the maximum possible score which is dependent on the individual linkage and multiplying by 100 to give a percentage. The overall site score is considered to be the maximum of the individual normalised S-P-R linkages score (Table 1.1). As can be seen the site based on the initial risk screening undertaken the Historical Disposal Site falls into:

Highest Risk (Class A): Sites with a score of greater than or equal to 70% for any site specific S-P-R linkage are considered to be potentially high risk or high uncertainty sites and site investigations should commence as soon as possible. This is for;

- **SPR 3** Leachate Migration through groundwater pathway(Human presence, private well)
- **SPR 5** Leachate Migration through groundwater pathway (Aquifer)
- **SPR 10** Landfill Migration Pathways (Lateral migration).
- **SPR 11** Landfill Migration Pathways (Vertical migration).

Table 1.1 Risk Screening Exercise



Risk ranking report for Dunkineely town dump - Donegal County Council (S22-02382)

Date: 23/03/2010

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Table	Points available	Rationale	SPRLinkage	Linkage Score	Norm Score
1a	7.00	EITHER (Type: Industrial, Area > 1 <= 5 Ha) OR (Type: Municipal, Area > 1 <= 5 Ha)	SPR1	112.00	37.33
1b	7.00	EITHER (Type: Industrial, Area >5 Ha) OR (Type: Municipal, Area > 1 <= 5 Ha)	SPR2	0.00	0.00
2a	3.00	Extreme Vulnerability	SPR3	168.00	70.00
2b	5.00	Karstified Groundwater Bodies (Rk)	SPR4	0.00	0.00
2c	0.00	No direct connection	SPR5	280.00	70.00
2d	3.00	Sand and gravel, made ground, urban, karst	SPR6	168.00	30.00
2e	5.00	Sand and gravel, made ground, urban, karst	SPR7	112.00	46.67
3a	3.00	On or within 50m of the waste body	SPR8	0.00	0.00
3b	0.00	Greater than 1km of the waste body / Undesignated site greater than 250m of the waste body	SPR9	0.00	0.00
3c	5.00	Regionally important aquifers (RK, Rf, Rg)	SPR10	105.00	70.00
3d	3.00	Greater than 300m but less than 1km or within outer SPA (SO) for GW supplies Or Greater than 1km (karst Aquifer)	SPR11	175.00	70.00
3e	2.00	Greater than 50m but less than 250m			
3f	5.00	On Site or within 50m of site boundary			

Risk Classification: A: Highest Risk

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2.0 DESK STUDY AND WALKOVER SURVEY

A walkover survey was undertaken on Tuesday 17th January 2011 by Angela McGinley and Joseph McGrath of RPS and Julie McMahon of Donegal County Council. Photographs of the site were taken and have been used in this report. The following preliminary site assessment is based on the information required in the Walkover Checklist as per EPA Code of Practice and information gathered from desk top study. The landfill site is situated in a rural area in the townland of Bogside near the Village of Dunkineely Co. Donegal at Grid Reference 176868E, 376429N. The land was initially thought to be privately owned. This has now been clarified and where the dump is believed to have been located belongs to Donegal County Council.

This preliminary assessment was undertaken on the area shown on Aerial Photograph included in Appendix A.

2.1 WALKOVER CHECKLIST

2.1.1 *What is the Current Landuse*

The land is being used to graze cattle. The site is enclosed by stock proof fencing to all boundaries. Access to site is via a stock proof gate from the regional road which runs along the northern and eastern boundaries.

The eastern portion of the site is bounded by an embankment which is overgrown with trees and scrub vegetation. This part of the site is thought to be the old dump and there is evidence of previous fencing to this area. Land registry records confirm that this area is in the ownership of Donegal County Council whilst the remainder of the site is in private ownership. The remainder of the site is being used for grazing



Picture 1 **View of Site from Northern Boundary**



Picture 2 **View from Southern Boundary**



Picture 3 View of Overgrown Area Along Eastern Boundary

2.1.2 What is the Neighbouring Landuse

The surrounding land consists mainly of grass and bogland and is being used for grazing. A regional road runs along the northern and eastern boundaries. There are a number of residential properties to the northern and southern boundaries of the site.

2.1.3 What is the Size of the Site?

The estimated size of the site is 2.475 Hectares.

2.1.4 What is the Topography?

The site is mainly level but is bounded on the eastern boundary by a steep embankment to the regional road (Mart Road).

2.1.5 Are There Potential Receptors?

Residents: The nearest residents are within 250m of the site (to the north and southern boundaries).

Any wetland or protected areas: The site is located in an area of blanket bogland and pasture.

Public water supplies: All properties on the regional road are on mains supply and there are no known wells proximate to the site.

Private Wells: There are no known wells proximate to the site.

Surface water: See 2.1.7 below.

Services: There are no services noted on the site.

Other building: There are currently none.

Others: Nil

2.1.6 Are There Any Potential Sources of Contamination?

Surface waste: Surface waste was observed along the eastern boundary during the walkover. This consisted of glass bottles, plastic bottle and electrical goods.



Picture 4 View of Surface Waste



Picture 5 View of Surface Waste

Surface ponding of leachate: There were no areas of surface ponding of leachate noted on the day of the site visit.

Leachate seepage: Seepage into a drainage ditch along the western boundary that was potentially leachate (also potentially naturally occurring iron) was noted on the day of the site visit. This did not appear to be connected to any streams or rivers.



Picture 6 Seepage Along the Western Boundary

Landfill Gas Odours: No odours were noted on the day of the site.

2.1.7 Are There Any Outfalls to Surface Water?

As mentioned above seepage into a drainage ditch along the western boundary was noted on the day of the site visit. No connection from this ditch to stream or river was found. There is a stream running along the regional road to the northern boundary of the site.

2.1.8 Are There Any Signs of Impact on the Environment?

Vegetation die off: There was no obvious signs of vegetation die off on the site.

Leachate seepages: Seepage into a drainage ditch along the western boundary that was potentially leachate (also potentially naturally occurring iron) was noted on the day of the site visit. This was rustic in colour as can be seen in Picture 6.

Odours: See 2.1.6 above in relation to landfill gas. No other odours were observed from the site.

Litter: Wastes were visible in area of overgrown vegetation which runs along the eastern boundary.

Gas bubbling through water: No gas bubbling through water was noted during the site visit.

Signs of settlement, subsidence, water logged areas: There were a number of water logged areas on site which is not unusual for the terrain and conditions

2.1.9 Are There Any Indications of Remedial Measures?

The area suspected to contain the disposed waste has been covered with a peat layer with areas of grass, and scrub predominate the site.

2.1.10 Describe Fences and Security Features

The site is enclosed by stock proof fencing to all boundaries. Access to site is via a stick proof fencing from the regional road which runs along along the northern and eastern boundaries. Access to site is via a secured gate from the main road along an access road which is also a walking trail.

2.2 SUBSEQUENT INFORMATION

Additional information will regards to the extent of the site was obtained. The estimated size of the site is now approximately 0.6 hectares based on local information and registry maps. This will be clarified during the site investigation.

Consultation with locals familiar with the site indicated that dumping of waste occurred exclusively along the embankment area on the eastern boundary of the site with waste being deposited down onto the embankment from the regional road (Mart Road). The overgrown embankment area was noted to contain evidence of waste on its surface.

3.0 CONCEPTUAL SITE MODEL AND RISK SCREENING EXERCISE

3.1 COLLATION OF DATA

A network diagram of all the source pathway-receptors (S-P-R) linkages that may be present and that have been considered as part of this assessment are shown in Figure 3.1. These S-P-R linkages have been derived from the risk from leachate migration and landfill gas migration. From the Conceptual Site Model the initial S-P-R linkages for the site are considered to be Leachate Migration through Groundwater and Surface Water Pathway and Lateral Landfill Gas Migration. This is shown on Drawing IBR0374/100 Conceptual Site Model

3.2 RISK SCREENING EXERCISE

The initial risk screening process allows for the prioritisation of sites into high, moderate and low risk and represents an assessment of the source-pathway-receptor (S-P-R) linkages in the conceptual model. A Tier 1 Risk assessment was undertaken using EPA web based data management system which provides an online tool for completing the Tier 1 Risk Assessment. The rationale for the allocated scoring for the source - hazard for the eleven possible S-P-R linkages is presented in Table 1.1 based on the tables provided in Section 4.3 of the EPA Code of Practice. Individual S-P-R linkage scores are then normalised to a rating of 100 by dividing the linkage score by the maximum possible score which is dependent on the individual linkage and multiplying by 100 to give a percentage. The overall site score is considered to be the maximum of the individual normalised S-P-R linkages score (Table 1.1). As can be seen the site based on the initial risk screening undertaken the Historical Disposal Site falls into Highest Risk (Class A). A rerun of Tier 1 Risk Assessment has been undertaken based on additional information obtained by site visits and other sources. This is shown in Table 3.1 and Table 3.2 below.

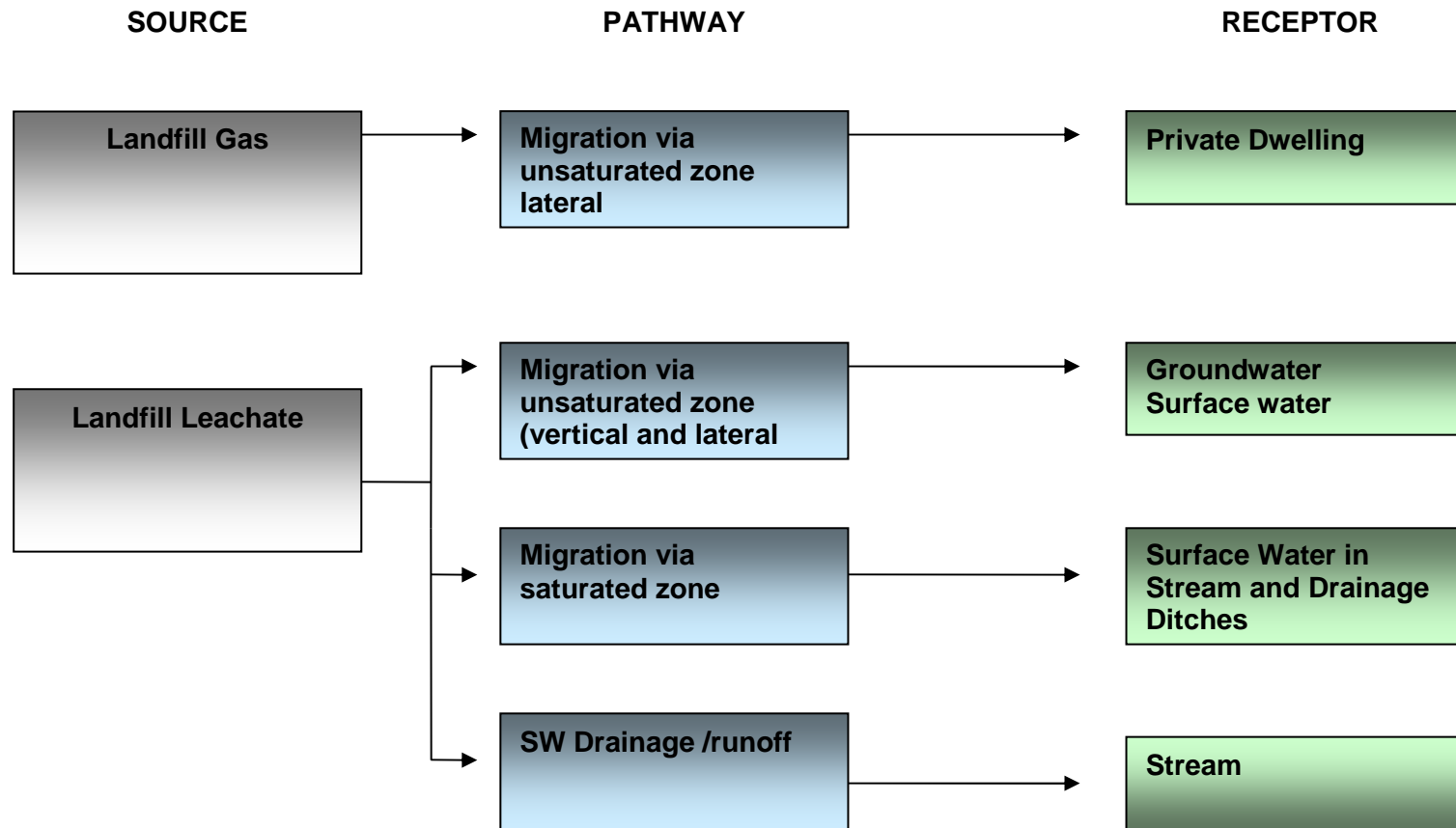


Figure 3.1 Network Diagram (Leachate Migration through Groundwater Surface Water Pathway and Landfill Gas Migration (Lateral))

Table 3.1 Risk Screening Exercise

Table	Score	Rationale
1a Leachate Hazard	5	The estimated size of the site is 0.6 Ha. The site is owned by Donegal County Council and was in operation from 1975 until 1983 accepting municipal waste.
1b Landfill Gas Hazard	5	The estimated size of the site is 0.6 Ha. The site is owned by Donegal County Council and was in operation from 1975 until 1983 accepting municipal waste.
2a Leachate Migration-GW Vulnerability	3	Groundwater vulnerability is E (rock near surface or karst) - From GSI Interim Vulnerability Map.
2b Leachate Migration-GW Flow Regime	5	Regionally important aquifer - Karstified
2c Leachate Migration-SW Drainage	0	There is no direct connection
2d Landfill Gas -Lateral Migration	3	The nearest resident is within 250m of the site. The site is located karstified limestone bedrock at surface, sandstone and cutover peat. From GSI Teagasc subsoil map.
2e Landfill Gas -Vertical Migration	5	No receptors currently located above source. House located on site boundary. The site is located karstified limestone bedrock at surface, sandstone and cutover peat. From GSI Teagasc subsoil map.
3a Leachate Migration-Human Presence	3	The nearest resident is within 50m of the site. Private wells are indicated on the GSI GW well map. Within 1km of the waste body. To be confirmed. There are no groundwater dependent terrestrial ecosystems

Table	Score	Rationale
3b Leachate Migration-Protected Areas	0	NHA/SAC greater than 1km of the waste body(St Johns Point pNHA and SAC, Donegal Bay SPA) There are no groundwater dependent terrestrial ecosystems within 1km of the site. Corine data indicates that the site is located on pastures.
3c Leachate Migration-Aquifer Category	5	Groundwater vulnerability is E (rock near surface or karst) - From GSI Vulnerability Map. Regionally important aquifer - Karsified Rk
3d Leachate Migration-Public Water Supplies	3	Public water supply is located at Croagh Lough located to the North of the site. Site interim vulnerability is E (rock near surface or karst) and E (Extreme) - From GSI. The water main is located on the Mart road passing the site.
3e Leachate Migration-Surface Water Bodies	2	Greater than 50m but less than 250m
3f Landfill Gas - Human Presence	5	The nearest resident is within 50m of the site (from northern boundary).

Table 3.2 Normalised Score

SPR	Equation	SPR Linkage Score	Maximum linkage score	Linkage	Normalised score %
1	1aX(2a+2b+2c)X 3e	80	300	Leachate Migration through groundwater and surface water	26.7
2	1aX(2a+2b+2c)X 3e (SWDTE)	0	300	Leachate Migration through groundwater and surface water	0.0
3	1aX(2a+2b)X 3a	120	240	Leachate Migration through groundwater pathway	50.0
4	1aX(2a+2b)X 3b	0	240	Leachate Migration through groundwater pathway	0.0
5	1aX(2a+2b)X 3c	200	400	Leachate Migration through groundwater pathway	50.0
6	1aX(2a+2b)X 3d	120	560	Leachate Migration through groundwater pathway	21.4
7	1aX(2a+2b)X 3e	80	240	Leachate Migration through groundwater pathway	33.3
8	1aX2cX 3e	0	60	Leachate Migration through surface water pathway	0.0
9	1aX2cX 3b (SWDTE)	0	60	Leachate Migration through surface water pathway	0.0
10	1bX2dX 3f	75	150	Landfill Migration Pathways	50.0
11	1bX2eX 3f	125	250	Landfill Migration Pathways	50.0

From these scores the site can be preliminarily assigned a risk classification (as per Table 3.3) which represents the intrinsic risk that the site poses to the environment.

Table 3.3 Risk Classification (as per Table 5 of the Code, EPA)

Risk Classification	Range of Risk Scores	
Highest Risk (Class A)	Greater than or equal to 70% for any individual SPR linkage	Sites with a score of greater than or equal to 70% for any site specific S-P-R linkage are considered to be potentially high risk or high uncertainty sites and site investigations should commence as soon as possible.
Moderate Risk (Class B)	Between 40-70% for any individual SPR linkage.	Sites with a score between 40% and 70% and site investigations are required to verify the risk status.
Lowest Risk (Class C)	Less than or equal to 40% for any individual SPR linkage	Sites with a score no more than 40%, these sites are not considered to pose a significant risk to the environment and human health.

Based on the initial risk screening undertaken the Historical Disposal Site falls into:

Moderate Risk (Class B) Sites with a score of greater than or equal to 40% for any site specific S-P-R linkage are considered to be potentially high risk or high uncertainty sites and site investigations should commence as soon as possible. This is for the following;

- **SPR 3** Leachate Migration through groundwater pathway
- **SPR 5** Leachate Migration through groundwater pathway
- **SPR 10** Landfill Migration Pathways
- **SPR 11** Landfill Migration Pathways

The reduction in the site risk is due to the reduced area of waste footprint

4.0 ESTIMATION OF WASTE DISPOSED AT THE SITE

There is no available information on the filling operations undertaken at this site. The estimated size of the site is approximately 0.6 hectares. Based on an average waste depth of 2m the estimated volume deposited at the site is 12,000 m³. In accordance with the EPA Code of Practice, waste tonnages should be calculated with the conversion table set out in Schedule to the Waste Management (landfill Levy) Regulations 2002 (SI No 86 of 2002). As the waste mainly composes of household waste the waste category "Other wastes not otherwise referred to" has been chosen. This would equate to 18,000 tonnes of waste. A topographical survey and trial pits will be undertaken at the site and more detailed calculations can then be undertaken.

Table 4.1 Volume to Weight Conversion Factors (Schedule 2 (c), (SI No 86 of 2002))

Waste Category	Typical Waste Types	Cubic Metres to Tonnes - Multiply By:
Inactive or inert waste	Largely water insoluble and non or very slowly biodegradable: e.g. sand, subsoil, concrete, bricks, mineral fibres, fibreglass etc.	1.5
Other wastes not otherwise referred to		1.0

5.0 CONCLUSIONS AND RECOMMENDATIONS

This report represents a Tier 1 assessment of the Risk Assessment Methodology as per the EPA Code of Practice. The Code of Practice states that Moderate Risk (Class B) sites are defined as sites with a score between 40-70% for any individual SPR linkage and site investigations are required to verify the risk status. The site is Moderate Risk as it scored between 40-70% for the following;

- **SPR 3** Leachate Migration through groundwater pathway
- **SPR 5** Leachate Migration through groundwater pathway
- **SPR 10** Landfill Migration Pathways
- **SPR 11** Landfill Migration Pathways

A Tier 2 exploratory investigation and sampling of the site to include trial pitting, waste, surface water and leachate sampling should be undertaken in accordance with EPA Guidance.

APPENDIX A

DRAWINGS

Section 22 - Dunkineely Town Dump

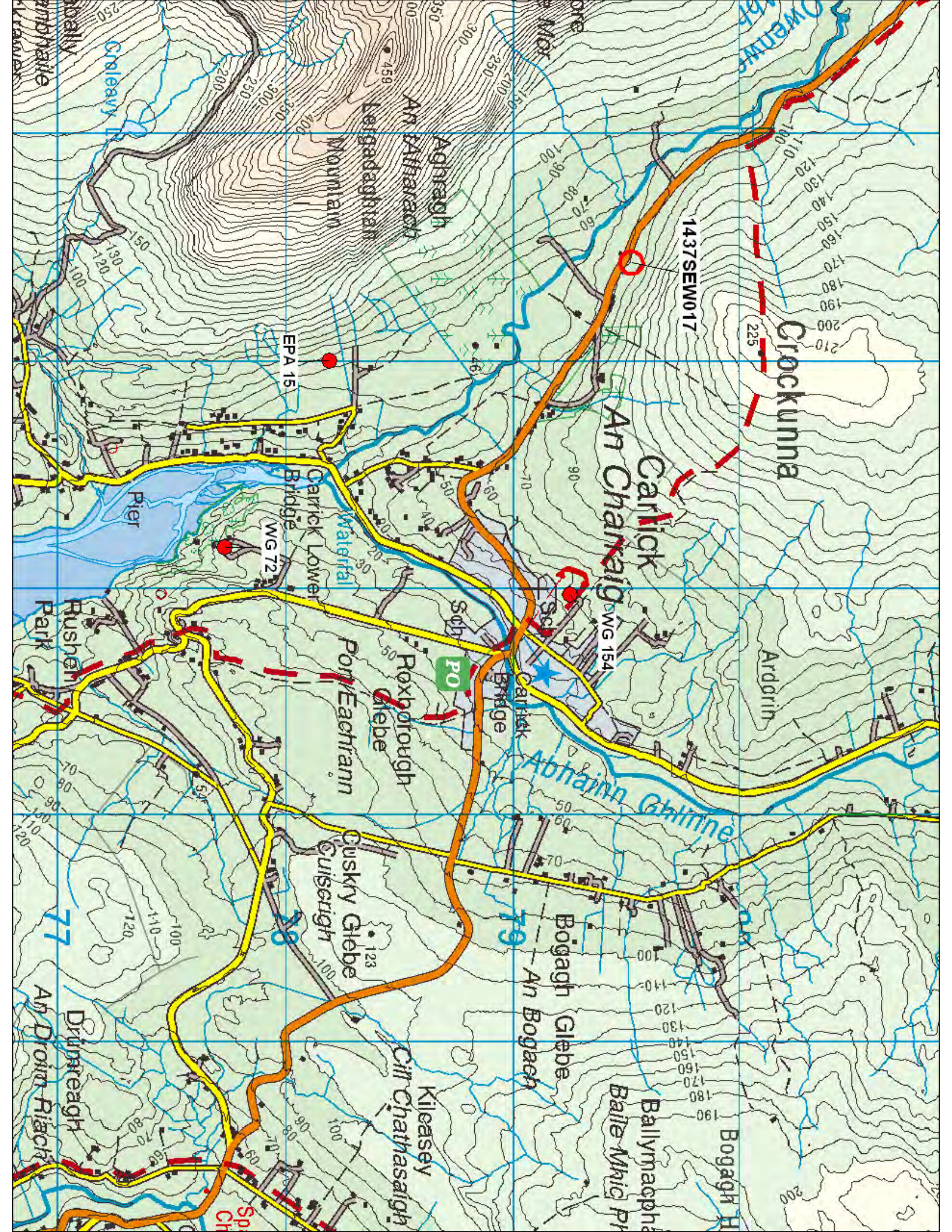
11 February 2008



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Scale 1:10,000



Crockunna

1437SEW017

Carrick
An Charraig

Ardarin

Abhainn Ghlinne

Port Eachtrann
Roxborough
Glebe

PO

Cuskry Glebe
Cuiscurigh

Bogagh Glebe
An Bogagh

Kiliassey
Cill Chathasaigh

Ballymaopha
Baile Mhic Ph

Bogagh H

Coleaivy

Pier

EPA 15

Carrick Lower
Bridge

WG 72

Rusham
Park

77

Drumreagh

An Droim Riach

Sp Ch

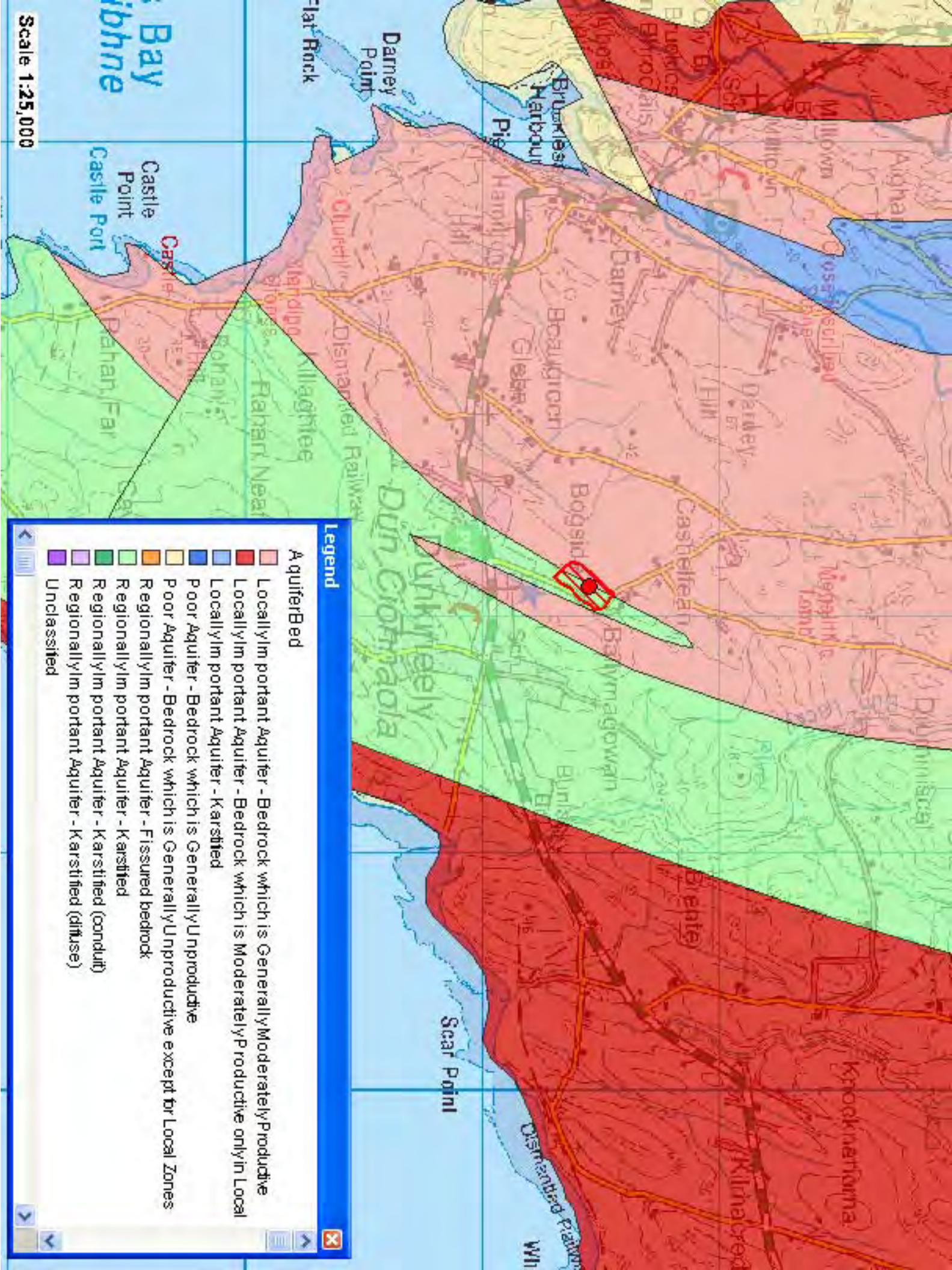


Inver Bay
Ba Inbhir

INVER BAY
Ba Inbhir

Castle Point
Castle Port
Kiln Port
Menamny
Piggyhaughn
Rahan Far
Rahan Near
Cavan
The Scar
Cavan Point

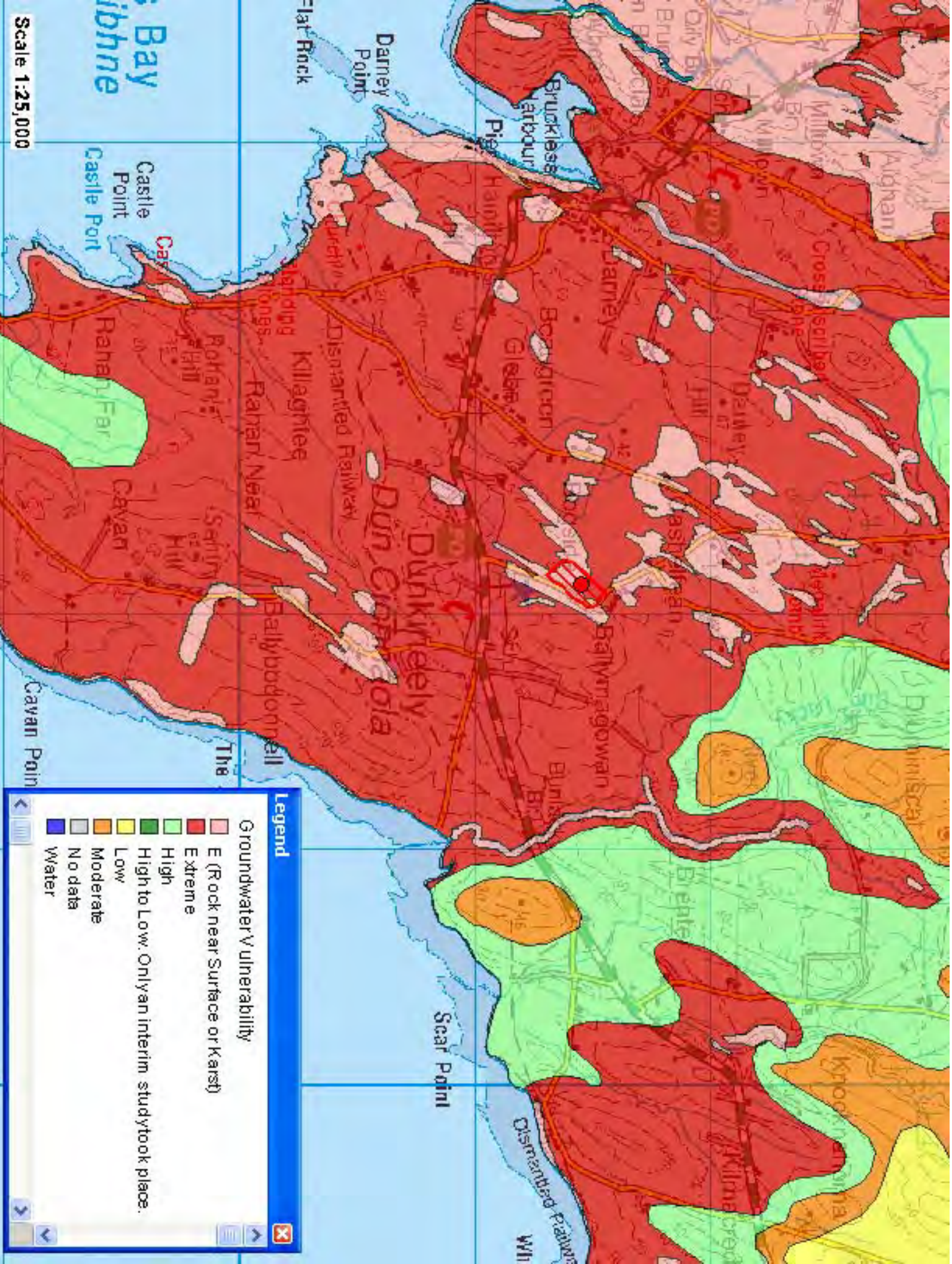
Green Strand
Darney Point
Flat Rock
Church
Standing Stones
Killaghtee
Dismantled Railway
Dun Kineely
Dun Kineely
Bogsides
Cashelrean
Ballymagowan
Bunlar
Scar Point
Knocknaho
Megalithic Tomb
Cross-inscribed Stone
Darney
Raunreen
Glebe
Pier Hamilton
Harbour
An Broclais
Miltown
Milltown
Dun Kineely
1737SWW021
1737SWW015
1737SWW014
DG-10-3
DG-10-4



Scale 1:25,000

Legend

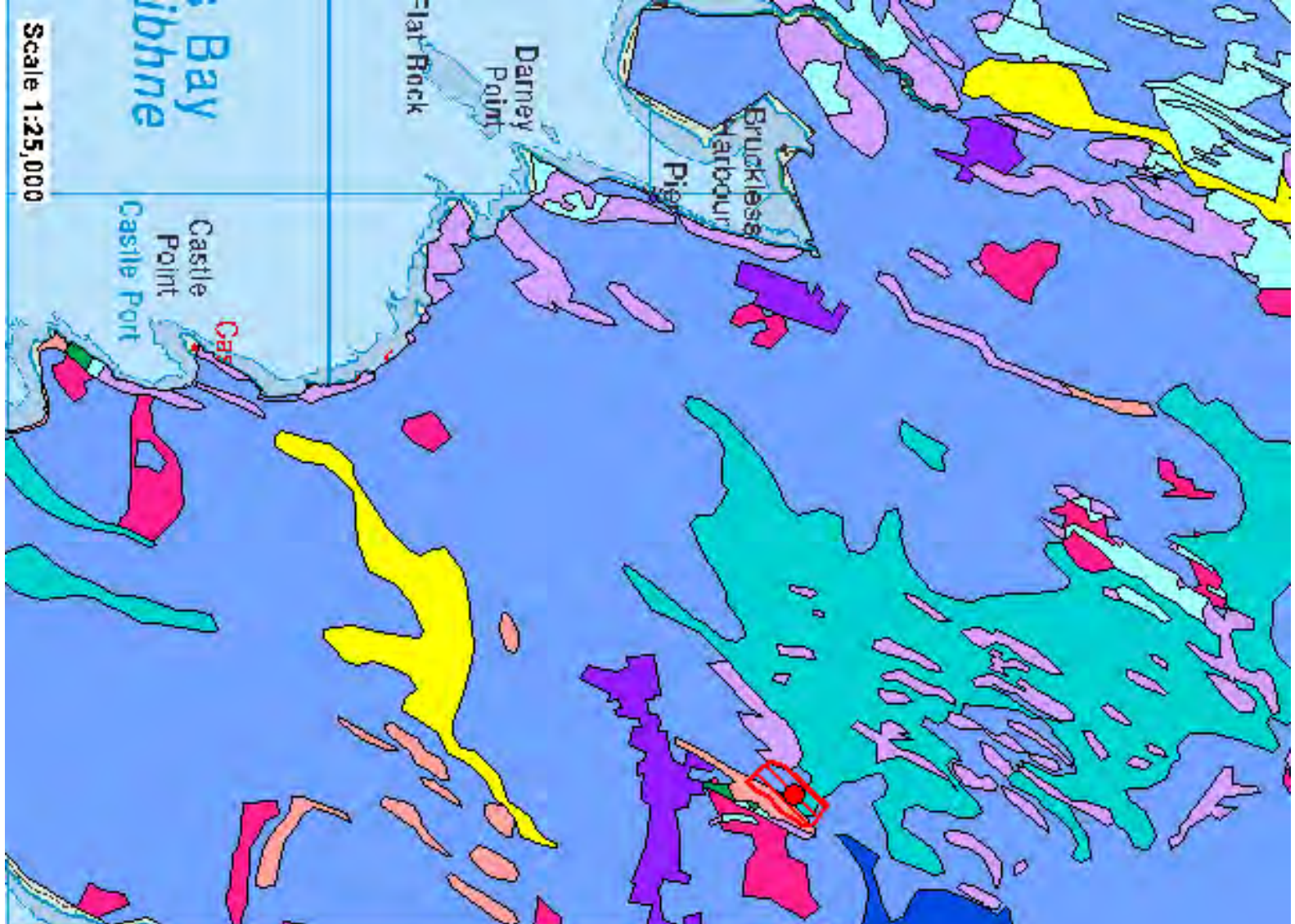
- A quiferBed
- Locallylm portant Aquifer - Bedrock which is GenerallyModeratelyProductive
- Locallylm portant Aquifer - Bedrock which is ModeratelyP roductive only in Local
- Locallylm portant Aquifer - Karstified
- Poor Aquifer - Bedrock which is GenerallyUnproductive
- Poor Aquifer - Bedrock which is GenerallyUnproductive
- Regionallylm portant Aquifer - Fissured bedrock
- Regionallylm portant Aquifer - Karstified
- Regionallylm portant Aquifer - Karstified (conduit)
- Regionallylm portant Aquifer - Karstified (diffuse)
- Unclassified



Scale 1:25,000

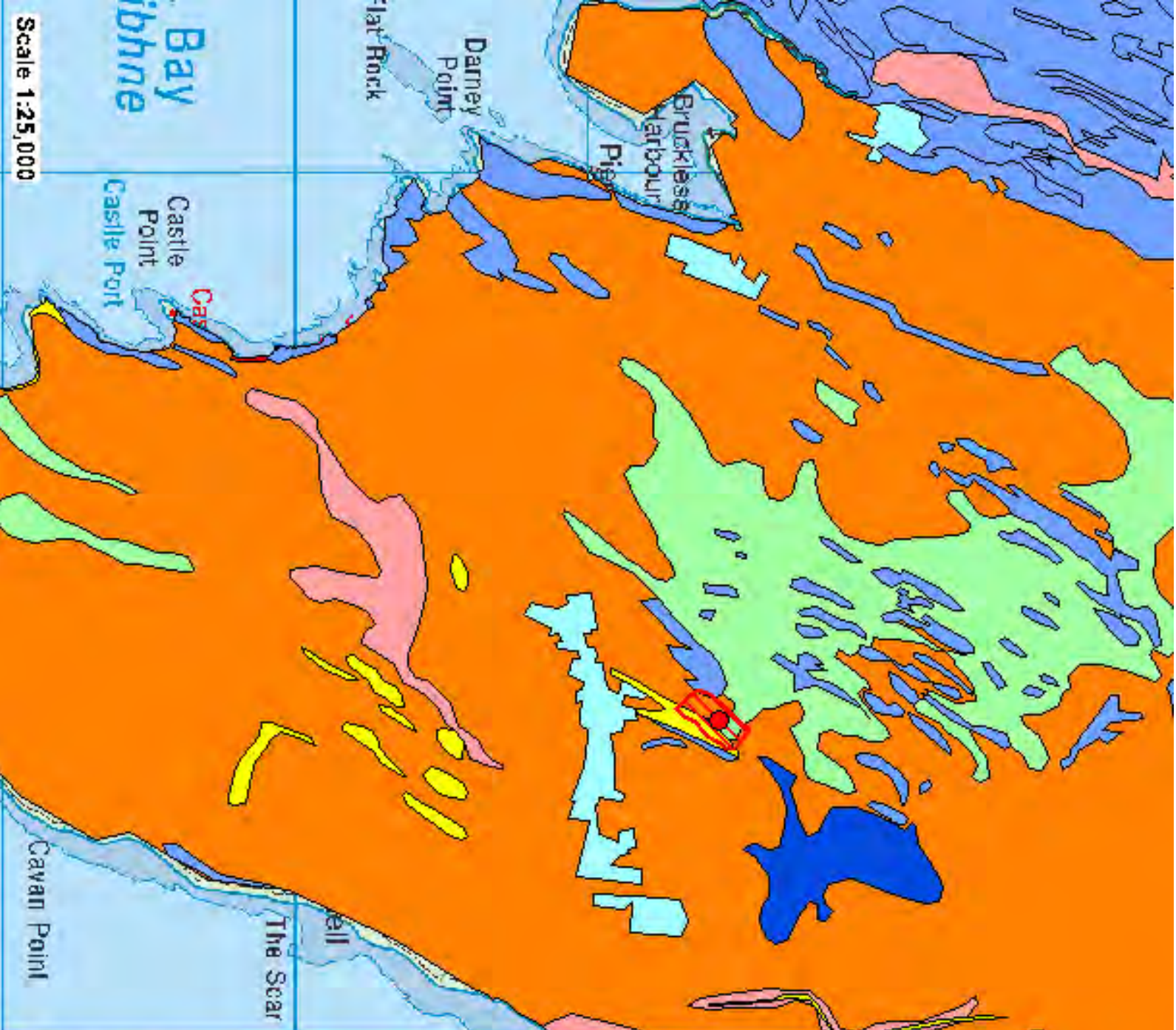
Legend

- Groundwater Vulnerability
- E (Rock near Surface or Karst)
- Extreme
- High
- High to Low. Only an interim study took place.
- Low
- Moderate
- No data
- Water



Legend

- Soil_soils_je_DL_M art 1 by Name
- Acid Brown Earths / Brown Podzolics
 - Aeolian Undifferentiated
 - Beach sand and gravels
 - Blanket Peat
 - Fen Peat
 - Grey Brown Podzolics / Brown Earths, Basic Lac
 - Lithosols / Peats, Basic
 - Lithosols / Regosols, Acidic
 - Made
 - Marine / Estuarine sediments
 - Mineral Alluvium
 - Peaty Gleys Basic / Parent Materials, Basic
 - Peaty Gleys, Acidic
 - Podzols - Peaty
 - Raised Bog cutaway/cutover
 - Renzinas / Lithosols, Basic
 - Shallow Surface water Gleys / Shallow Groundwater Gleys, Acidic
 - Surface Water Gleys / Groundwater Gleys, Acidic
 - Surface water Gleys / Groundwater Gleys, Basic
 - Water



Scale 1:25,000

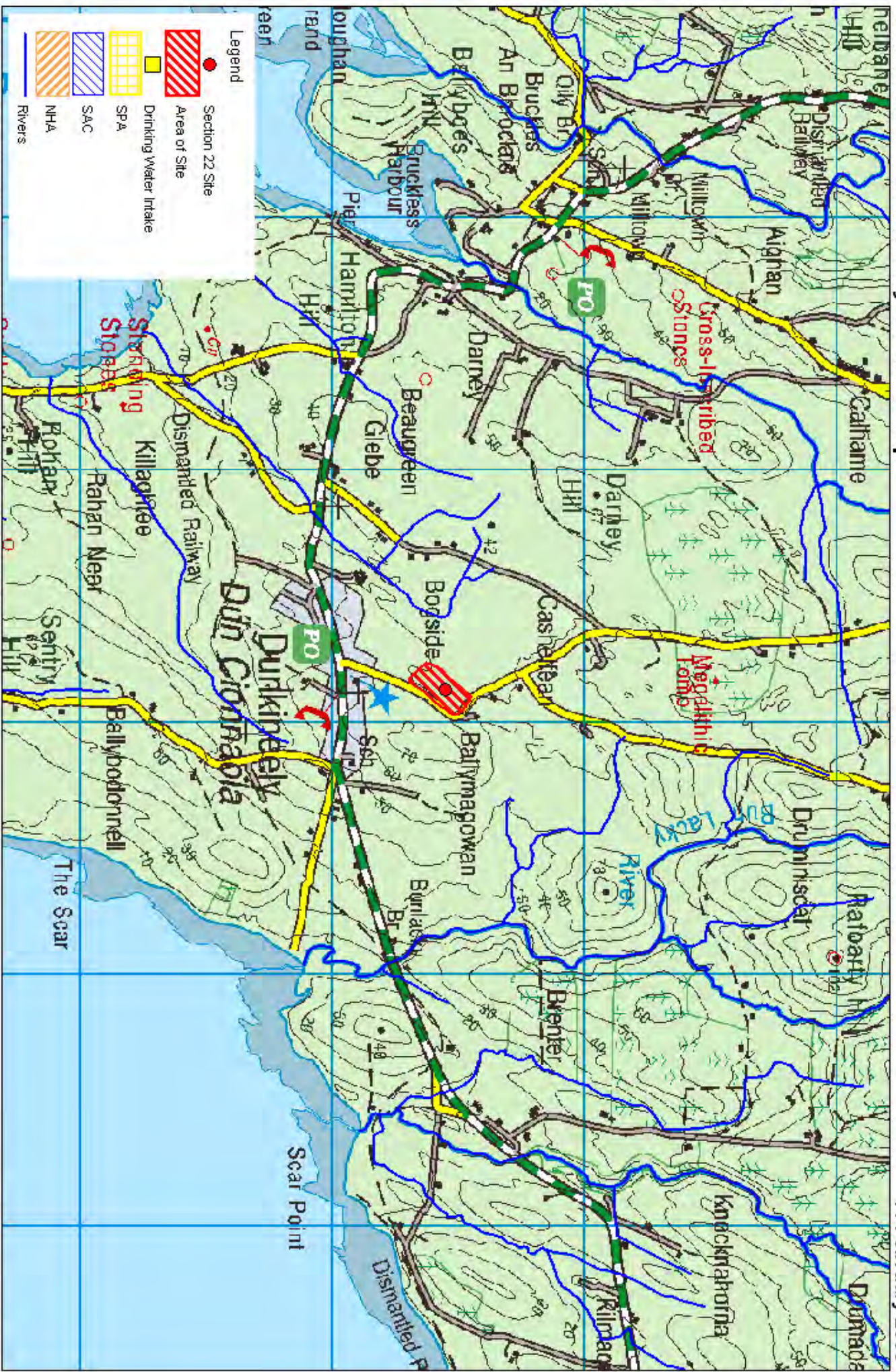
Legend

Soil_subsoils_ie_DL_M ar1 1 by Name

- Alluvium Undifferentiated
- Beach / Raised beach sands and gravels
- Bedrock at Surface
- Blanket Peat
- Blown Sand
- Blown Sand in dunes
- Cutover Peat
- Estuarine Sediments (silts/clays)
- Fen Peat
- Granite sands and gravels
- Granite Till
- Karstified Limestone bedrock at Surface
- Lake Sediments Undifferentiated
- Limestone Till (Carboniferous)
- Made Ground
- Marine Clays
- Marine sands and gravels
- Metamorphic sands and gravels
- Metamorphic Till
- Quartzite sands and gravels
- Quartzite Till
- Sandstone Till (Devonian/Carboniferous)
- Sandy
- Scree
- Shales and sandstone till (Namurian)
- Tidal Marsh
- Water

Section 22 - Dunkineely Town Dump

11 February 2008

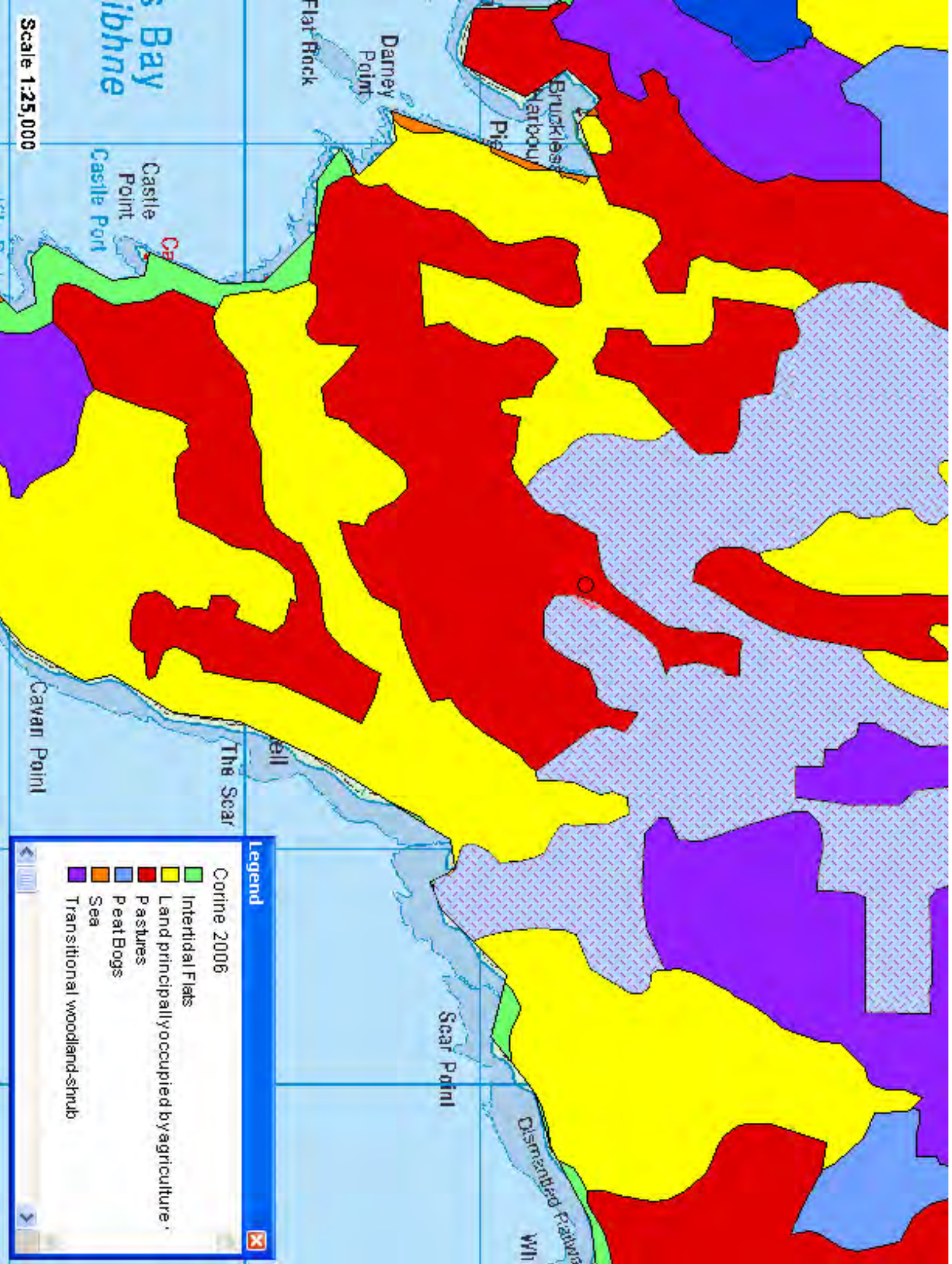


Legend

- Section 22 Site
- Drinking Water Intake
- SPA
- SAC
- NHA
- Rivers

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NORTH
 Scale 1:20,000



Legend

Corine 2006

- Intertidal Flats
- Land principally occupied by agriculture
- Pastures
- Peat Bogs
- Sea
- Transitional woodland-shrub

Dunkineely Town Dump



1 0 1 2
Kilometers
2012/02/CCMA/DonegalCountyCouncil

NOTES

1. Verifying Dimensions:
The contractor shall verify dimensions against such other drawings or site conditions as pertain to this part of the work.
2. Existing Services:
Any information concerning the location of existing services indicated on this drawing is intended for general guidance only. It shall be the responsibility of the contractor to determine and verify the exact horizontal and vertical alignment of all cables, pipes, etc. (both underground and overhead) before work commences.
3. Issue of Drawings:
Hard copies, dwf and pdf will form a controlled issue of the drawing. All other formats (dwg, dwf etc.) are deemed to be an uncontrolled issue and any work carried out based on these files is at the recipient's own risk. RPS will not accept any responsibility for any errors arising from the use of these files, either by human error by the recipient, failure of un-dimensioned measurements, compatibility issues with the recipient's software, and any errors arising when these files are used to add the recipient's drawing production, or setting out on site.
4. Datum:

POTENTIAL ON-SITE SOURCES

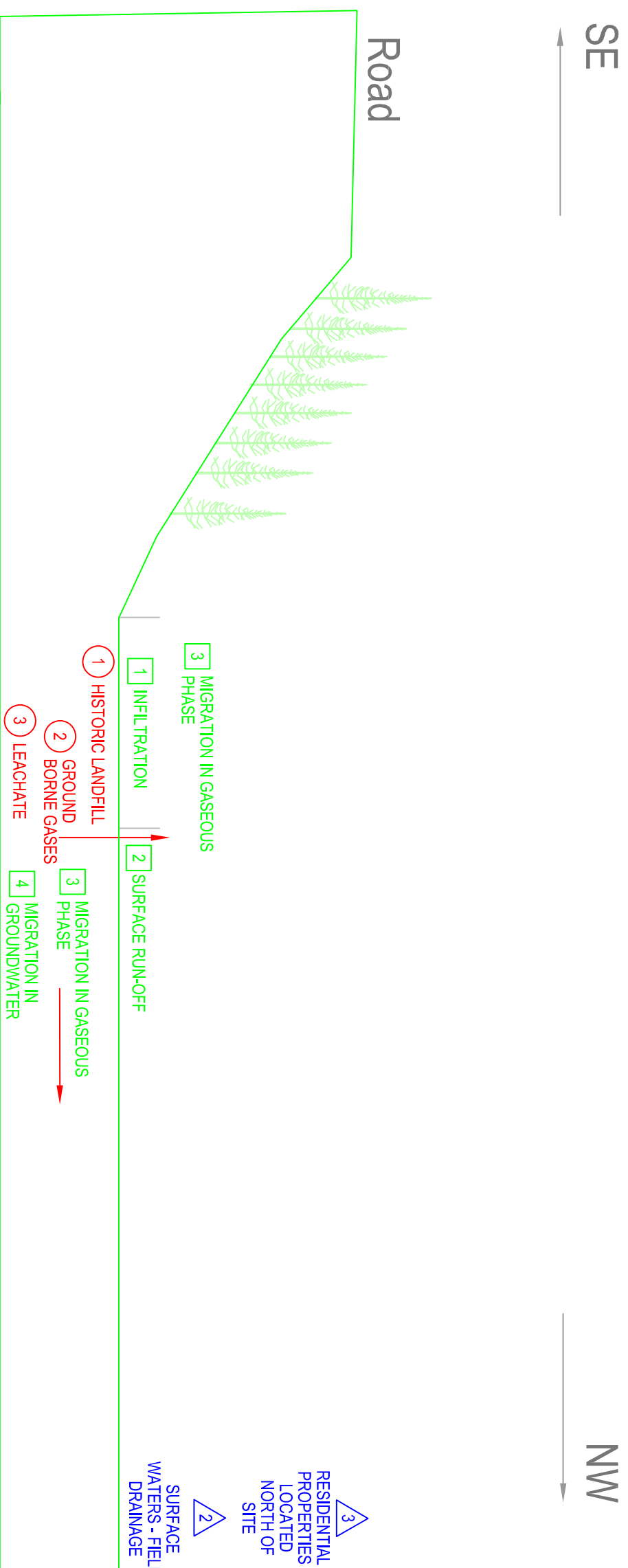
1. Historic Landfill.
2. Ground borne gases.
3. Leachate.

POTENTIAL PATHWAYS

1. Infiltration.
2. Surface Water Run-Off
3. Migration in Gaseous Phase.
4. Migration in groundwater.

POTENTIAL RECEPTORS

1. Groundwater - Regionally Important Aquifer
2. Field Drains
3. Residential Properties Located Immediately North of Site



rev	amendments	drawn	date

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Client	Donegal County Council
Project	Dunkineely Historic Landfill
Title	Draft Conceptual Site Model

Drawing Status	Sheet Size	Drawing Scale
Draft	A3	N.T.S.

Drawing Number	Rev
IBR0374/100	-

Project Leader	Drawn By	Date	Initial Review
KMGN	JMCG	April 2012	AMCG

RPS

Dunkineely, Historic Landfill
Dunkineely, Co. Donegal.
Tier 2 Exploratory Investigation and
Risk Assessment

IBR0384/Rev 1/Final September 2012



DOCUMENT CONTROL SHEET

Client	Donegal County Council					
Project Title	Dunkineely Historic Landfill					
Document Title	Environmental Risk Assessment Report (Tier 2)					
Document No.	IBR0384/Reports					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	3	32	9	7	4

Rev.	Status	Author(s)	Reviewed & Approved By	Issue Date
1	Final	<hr/> <p>J Mc Grath, Project Scientist</p>	<hr/> <p>K McNamara, Senior Scientist</p>	21/09/2012

EXECUTIVE SUMMARY

RPS was appointed by Donegal County Council to undertake a Tier 1, 2, and 3 Environmental Site Investigation and Risk Assessment of an area of land to the north of Dunkineely, Co. Donegal in accordance with the EPA Code of Practice for Environmental Risk Assessments for Unregulated Waste Disposal Sites.

The investigation was based on a desk study of available information, a walkover survey and an exploratory trial pit investigation carried out by RPS. The investigation made provision for contamination testing of; soil samples, groundwater/leachate samples and surface water samples.

The key findings of the report are as follows:

KEY FINDINGS

I. SITE HISTORY

Historic mapping held on file by Ordnance Survey of Ireland (6 inch colour 1829-1841 and 25 inch black and white 1897-1913) was consulted to ascertain the previous use of the site. The historic maps indicate that the site appears to have been undeveloped and in agricultural use throughout this period.

II. GROUND CONDITIONS

The exploratory investigation made provision for seven (7) trial pits to a maximum depth of 3.7m below ground level. The site investigation logs indicate that the site is underlain by the following general sequence:

- Topsoil
- Made Ground (with fully decomposed waste comprising glass, plastic, metal and bricks)
- Glacial Till
- Peat
- Limestone Bedrock

III. GROUNDWATER CONDITIONS

During the site investigation, groundwater was encountered within four of the seven trial pits at depths from 0.7m to 1.20m bgl.

IV. GROUND CONTAMINATION

Chemical analysis of soil results indicated that all samples recorded contaminant concentrations below generic screening values for a commercial end use.

V. GROUNDWATER CONTAMINATION

Chemical analysis of two groundwater 'grab' samples from TP03 and TP05 indicated that a number of contaminants (Chloride, Potassium, Manganese and PAHs) recorded concentrations above the EPA IGVs.

VI. RISK ASSESSMENT

A review of the CSM indicated that contaminant linkages in relation to environmental receptors (groundwater) are present and potential unacceptable risks remain unquantified in the absence of mitigating measures and further assessment.

VII. RECOMMENDATIONS AND FURTHER WORK

A number of boreholes should be advanced within the site with at least one borehole upstream and downstream of the waste body. Boreholes should be targeted to the shallow groundwater adjacent to the waste body and the bedrock aquifer outside of the waste body. Two rounds of groundwater and surface water sampling should be undertaken. At least four rounds of monitoring of ground borne gases should be carried out with at least one round at low atmospheric pressure.

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1.0 INTRODUCTION

1.1 TERMS OF REFERENCE

RPS was commissioned by Donegal County Council (DCC) to undertake a Tier 1, 2, and 3 Environmental Site Investigation and Risk Assessment of an area of land to the north of Dunkineely, Co. Donegal in accordance with the EPA Code of Practice for Environmental Risk Assessments for Unregulated Waste Disposal Sites. The site location and layout is provided in Figure 1 and 2.

This report should not be read in isolation from the Tier 1 Preliminary Assessment Report. It is intended that only selected information that is included within the Tier I report is repeated within this report for clarification purposes.

1.2 OBJECTIVES

The specific aims of the assessment were to:

- Determine the nature and extent of buried waste material within the eastern portion of the site;
- Assess any potential risks to human or environmental receptors associated with the presence of the waste material; and
- Provide an outline strategy in relation to the management and remediation of the site, if deemed necessary.

1.3 OVERALL METHODOLOGY

In order to achieve the above objectives the following scope of work was undertaken:

- Desk Based Survey and Site Walkover including collation of information from relevant authorities (*i.e.* GSI borehole records and bedrock information from the surrounding area) and review of previous investigation reports.
- Development of a Tier 1 Conceptual Site Model.
- Design and Implementation of a Soil and Groundwater Preliminary Site Investigation in accordance with BS 10175:2011.

- Qualitative assessment of risks to human and environmental receptors in accordance with the Environmental Protection Agency (EPA) Code of Practice for the Environmental Risk Assessment for Unregulated Waste Disposal Sites, 2007.
- Preparation of a report as per Chapter 8 “Reporting Requirements” in the EPA Code of Practice for Environmental Risk Assessment for Unregulated Waste Disposal Sites, 2007.

1.4 ASSESSMENT APPROACH

The assessment has been carried out in accordance with the EPA Code of Practice for the Environmental Risk Assessment for Unregulated Waste Disposal Sites, 2007 (EPA Code of Practice).

A consideration of the impact of the site on the environment is based on a risk assessment using the ‘Source – Pathway – Receptor’ model where the probability of damage occurring is considered in the context of the severity of consequence of that event actually happening. The S-P-R approach underpins the EPA Code of Practice.

The assessment looks at the relationship of possible contamination on the environment (*i.e.* the surroundings and habitats) and on a range of receptors (such as humans, flora, fauna and ecological systems) to develop a conceptual understanding of what is occurring. The relevant components of the system are determined in conjunction with how they are potentially connected or linked. Aspects of the source material and impacts on the receptors are identified and measured as part of a characterisation process. This in turn facilitates the development of environmental engineering design controls to manage, mitigate, protect, and/or remediate the situation.

As the waste is buried beneath ground the primary environmental system which is exposed is the hydrological system (leachate, surface water flow, interflow and subsurface & groundwater flow) and landfill gas migration. A factor that makes this process difficult is that many of the processes in hydrology and hydrogeology are unseen, so there is a need for conceptualisation – shaping a structure of the situation to aid understanding and development of a system model against which measurement can take place.

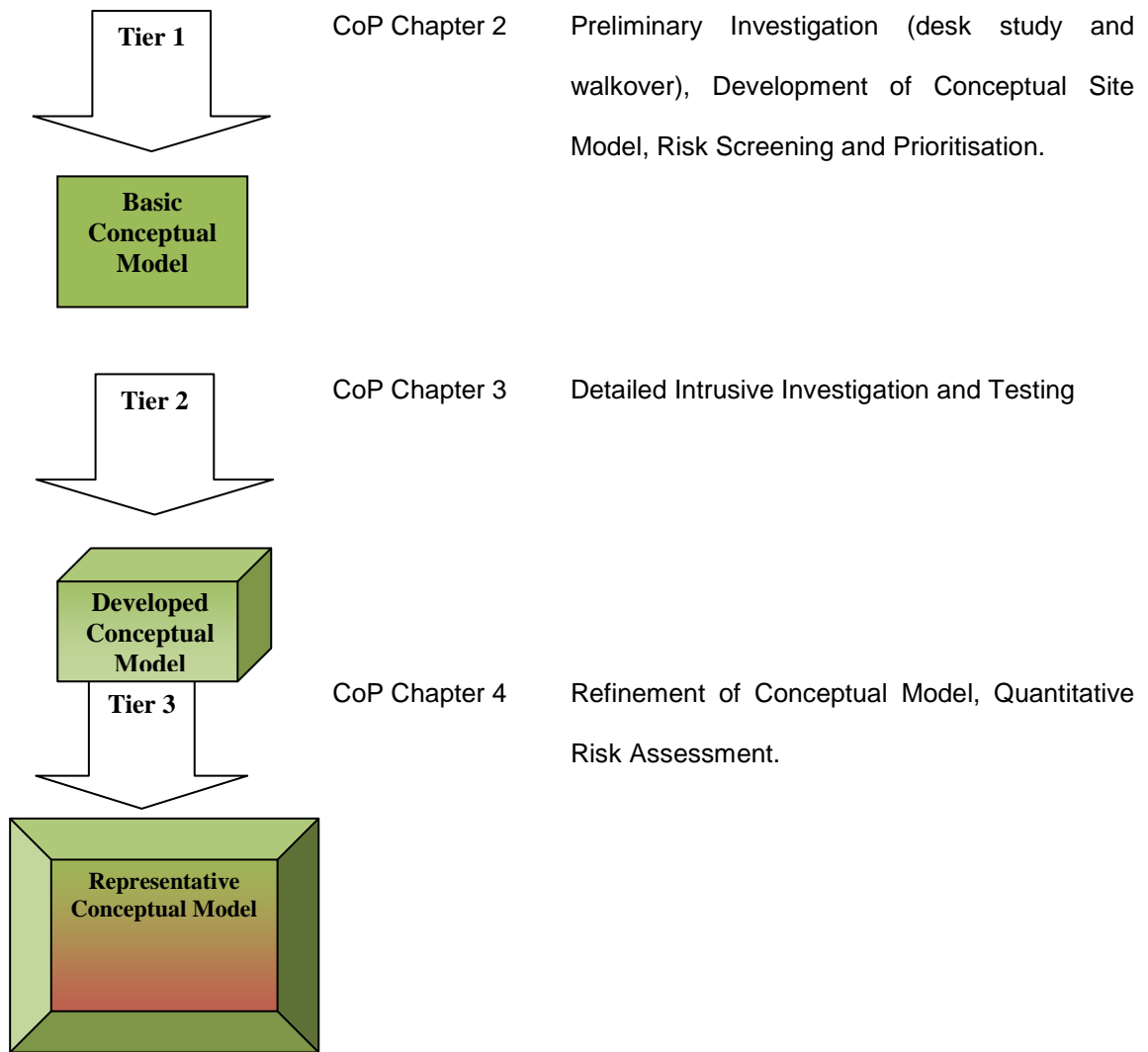
In this case, the relationship between the discrete **source** of the contamination (*i.e.* buried waste) and the receiving environment known as the **receptor** (*i.e.* the water systems, for example: groundwater bodies, soil matrix) is considered. The connecting route, known as the **pathway** (groundwater flow, drainage systems and soil systems) and the driving force in the form of a fluid (*i.e.* liquid in the form of rainfall and leachate, and gas such as landfill gas) can induce contamination to move through the system. Thus the system can be summarised by the following:

Source → Pathway → Receptor

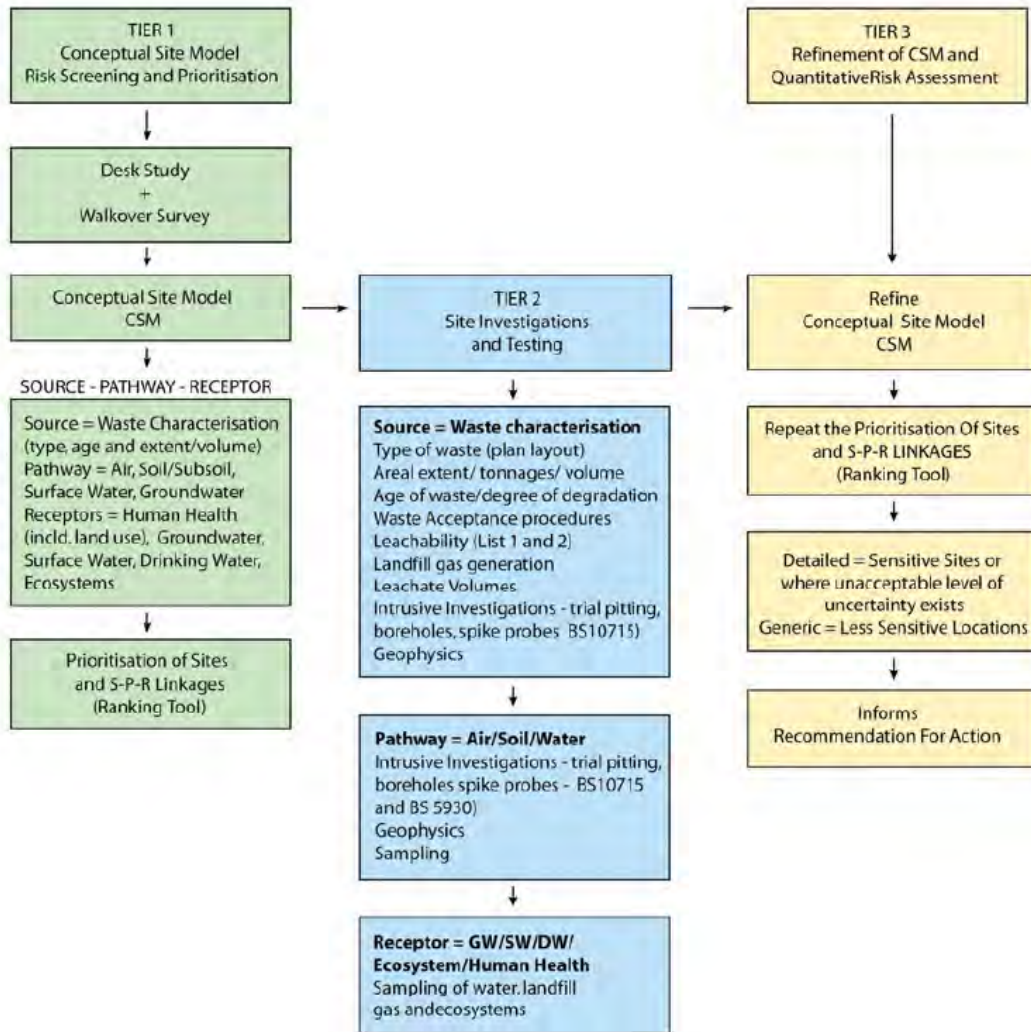
- **Source:** Substance or material that has the potential to cause harm to the environment or human health through by virtue of its physical or chemical characteristics.
- **Receptor:** A human or environmental entity which has the potential to be harmed through direct or indirect exposure to the source.
- **Pathway:** Mechanism by which the receptor can be exposed to the source.

In the EPA Code of Practice “Source-Pathway-Receptor” (SPR) approach to risk assessment, all three elements have to be present and linked in order for a risk to be present. If any of these components is absent there is, by definition, no risk.

The Code of Practice utilises a structured phased approach to identify the S-P-R components and conduct a risk assessment of the linkages between the elements. The process involves preliminary site investigations and initial screening to indicate the range of high to low risk factors. Areas requiring further investigation are identified, and finally the model is fine-tuned. At each stage the information and risks are reviewed and assessed before progressing to the next phase. The Code of Practice tiered methodology is as follows:



The phased approach to be undertaken at the site is outlined below in accordance with the EPA Code of Practice Risk Assessment Methodology – Phase Approach.



1.5 ASSUMPTIONS AND LIMITATIONS

Assumptions and uncertainties in the development of a conceptual model must be identified and clearly expressed to ensure that the degree of representation is understood before evaluation can meaningfully take place. The tiered technique of risk assessment within the Code of Practice seeks to minimise gaps in characterising each of the components within the S-P-R framework, so that at each stage the conceptual model is 'fine tuned' and uncertainties are reduced. Accordingly, the extent of information and data available at each stage of the model development is incorporated within each individual section of the assessment for Tiers 1, 2 and 3.

This report is for the use of Donegal County Council only and should not be relied upon by other parties unless specifically advised by RPS in writing. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report after its date of submission.

2.0 TIER 1 ASSESSMENT

2.1 DESK STUDY AND SITE WALKOVER

A site walkover was undertaken by RPS Environmental Scientists and a representative of Donegal County Council on the 17th January 2012. The results from site observations, discussions with local people and the collation of all available desk study information are provided in the following sections.

2.1.1 PUBLIC INFORMATION SOURCES

The following sources of publicly available information were consulted as part of the desk study:

- Ordnance Survey of Ireland, Discovery Series;
- Land Registry Records
- Ordnance survey of Ireland (OSI) online historical maps and aerial photographs;
- Geology of South Donegal, Geological Survey of Ireland (GSI) (1:100,000), Sheet 4;
- GSI On-line Groundwater database. Aquifer Classification, Aquifer Vulnerability, Teagasc Soil Classification;
<http://www.gsi.ie/Programmes/Groundwater/Groundwater+web+mapping.htm>
<http://www.gsi.ie/Old+Mapping.htm#gsi>;
- National Parks and Wildlife Service On-line database www.npws.ie;
- EPA Online Water Quality Mapping; <http://www.epa.ie/rivermap/>;

2.1.2 SITE LOCATION AND SETTING

The site is located off the Mart Road, approximately 500m north of the centre of Dunkineely, Co. Donegal. The location of the site is shown in Figure 1 and the layout is shown in Figure 2.

Table 1 Site Details

Site Address	Mart Road, Dunkineely, Co. Donegal
Grid Reference	176868E, 376429N
Estimated Site Area	Total site area: 0.38 Ha

The site currently consists of an agricultural field which was in use for cattle grazing at the time of the walkover. The site is enclosed by stock proof fencing to all boundaries. Access to the site is via a stock proof fence from the regional road which runs along the northern and eastern boundaries.

The eastern portion of the site is bounded by an embankment which is overgrown with trees and scrub vegetation. There is evidence of previous fencing to this area. Upon consultation with Land Registry records, it was revealed that this embankment is in the ownership of Donegal County Council whilst the remainder of the site is in private ownership. Consultation with locals familiar with the historic landfill indicated that dumping of waste occurred exclusively along this embankment area with waste being deposited down onto the embankment from the regional road (Mart Road). The overgrown embankment area was noted to contain evidence of waste on its surface including glass, plastic, metal (from former 'white' electrical goods) and tyres. The land immediately outside of the embankment area was noted to be very soft and saturated in places.

The remainder of the site rises slightly to the south-east whilst in the south-west, the site rises to two large mounds. A drainage ditch was noted along the western boundary of the site. The water within the drain was noted to be a rust colour. A natural spring and small stream was noted to the north-east of the site located just off the bend in the Mart Road.

The surrounding land uses of the study area are summarised below in Table 2.

Table 2 Surrounding Land Uses

Boundary	Land Use
North	3 No. one story residential properties
East	Mart Road and agricultural land
South	Agricultural land and residential properties along Mart Road
West	Bog and agricultural land

2.1.3 HISTORICAL LAND USE

Historic mapping held on file by Ordnance Survey of Ireland (6 inch colour 1829-1841 and 25 inch black and white 1897-1913) was consulted to ascertain the previous use of the site. The site appears to have been undeveloped and in agricultural use. It is noted from both the 1829-1841 and 1897-1913 surveys that the land ownership boundary of the embankment area is marked and similar in size to the ownership boundary existing today. The 1897-1913 survey indicates that the boundary has expanded and is slightly larger than the current boundary. A number of quarries are noted south of the site in the 1829-1841 survey map which are not present on the later 1897-1913 survey map.

2.1.4 REGIONAL & SITE GEOLOGY

According to the GSI website (Figure 3), the site is underlain by the Ballyshannon Limestone Formation which is described as a pale, grey calcarenite Limestone. The limestone is noted to be present along a strip which encompasses the eastern portion of the site, including the embankment area. The west of the site and the surrounding area is underlain by the Banagher Sandstone Formation which consists of feldspathic Sandstone and conglomerate.

According to the GSI/Teagasc online subsoil map of Ireland (Figure 4), the eastern portion of the site and embankment area contains karstified limestone bedrock at the surface as described above. The central portion of the site is underlain by Peat whilst the immediate north and south of the site are underlain by sandstone and shale derived till (Boulder Clay).

2.1.5 HYDROGEOLOGY

The GSI online bedrock map of Ireland (see Figure 5), classifies the bedrock underlying the eastern portion and embankment area of the site as a regionally important karstified aquifer (Rk). The west of the site and surrounding area is underlain by a locally important (Lm) aquifer which is moderately productive.

Groundwater within the site and surrounding area has been classified as extreme vulnerability due to the exposed bedrock at the surface (see Figure 6). Groundwater flow across the site is generally expected to follow the topography and flow in a west to north-westerly direction.

2.1.6 HYDROLOGY

A field drain is located along the western boundary of the site however it does not appear that this drain connects to any stream or river. The nearest surface water feature is an unnamed stream located approximately 300m west of the site. The unnamed stream flows in a south-west direction for approximately 1.5km and discharges into McSwines Bay. The nearest named watercourse is the Bunlacky River which is located approximately 1km east of the site. The river is located upstream of the site and would therefore not be a recipient of run-off from the site.

2.1.7 WATER QUALITY

2.1.7.1 Groundwater

No groundwater quality data is available for the site or local area.

2.1.7.2 Surface Water

No water quality data is available for the unnamed stream to the west of the site. The water within McSwines Bay is classified as 'unpolluted'.

2.1.8 LOCAL SENSITIVE SITES

The site is not within or adjacent to wetlands, nor is it within a Natural Heritage Area (NHA), a candidate Special Area of Conservation (cSAC) or Special Protection Area (SPA).

2.1.9 WASTE BODY

Due to the historical nature of the landfilling, there is no available information on the filling operations undertaken at the site. However information supplied by local people indicates that the waste comprised of mainly household refuse. During the RPS site walkover in January 2012, it was noted that glass, plastic, tyres and metal from electrical 'white' goods e.g. cookers, fridges etc was present on the surface of the embankment area.

2.2 TIER 1 ASSESSMENT

A Tier 1 assessment of the landfill site was undertaken by RPS in accordance with the EPA Code of Practice Environmental Risk Assessment for Unregulated Waste Disposal Sites.

The Code of Practice identifies eleven SPR linkages that should be considered within the conceptual model and assessed as part of the Tier 1 Assessment. Each of these linkages can be scored using the scheme provided in the EPA Code of Practice in order to provide an overall risk categorisation for the site.

An initial conceptual model was developed based on the initial information given above with consideration to the eleven Source-Pathway-Receptor (SPR) linkages identified in the EPA code of practice. At Tier 1 each aspect of each SPR linkage can be assessed according to particular criteria as defined within the EPA Code of Practice. The Code of Practice uses a separate scoring matrix for each aspect of each SPR linkage and these are defined within Tables 1a to 3f of the Code of Practice. Where an individual aspect is not present or not relevant within the context of the conceptual model it is given a score of 0.

The score for each linkage is normalised with respect to 100 by dividing the score for each linkage by the maximum available points for that linkage to give a percentage. The overall score for the site is taken as the maximum of the individual normalised scores. The site can then be placed in a prioritisation category depending upon the potential level of risk identified. Sites with a higher score represent those with either a higher level of risk, which may require remediation, or a high level of uncertainty, which requires further intrusive investigation. If a high score is due to a high level of uncertainty then the assessment should proceed to Tier 2.

The risk category bands relating to site scores as defined in the EPA Code of Practice are presented in Table 3 below.

Table 3 Risk Category and Prioritisation Class

Score	Priority Class	Risk Category	Definition
> 70%	A	High	High risk/high uncertainty sites. Further investigation required to confirm status. Presents potentially high risk to environment in current condition. Remediation / mitigation will be necessary. Highest priority with Regulating Authority.
40% to 70%	B	Moderate	Moderate risk/moderate uncertainty sites. Further investigation required to confirm status. Presents potentially moderate risk to environment in current condition. Remediation / mitigation may be required.
< 40%	C	Low	Low risk sites. Not considered to present risk to environment in current condition however further investigation may be required in case of change of land use.

Based on this Tier 1 Assessment, a **Moderate Risk (Class B)** relating to the migration of leachate through groundwater and the migration of landfill gas was assigned to the site. There was therefore a need to progress to Tier 2 and gather further information through intrusive investigation and testing. The main areas of uncertainty to be addressed in the investigation are:

- The nature of the waste;
- The volume and extent of waste;
- The presence of any leachate or gas produced within the waste;
- The depth to exposed bedrock beneath the waste;
- The risks posed to the groundwater beneath the site; and
- The risks posed to nearby human health receptors.

3.0 TIER 2 INVESTIGATION

3.1 PRELIMINARY CONCEPTUAL MODEL AND RISK ASSESSMENT

Based on information contained within the previous sections, a preliminary conceptual site model (CSM) was developed prior to the preliminary exploratory site investigation works.

Defining the conceptual model requires identification of all potential sources, pathways and receptors of contamination and identifying plausible combinations of these three components. These potentially significant pollutant linkages can then be qualitatively or quantitatively assessed to identify potential risks.

Source

The potential sources of contamination identified at the site are:

- Buried waste material across the site;
- Contaminated leachate within the waste material;
- Landfill Gas

Pathways

The pathways by which the contamination could reach potential receptors are described below:

- Landfill Gas Migration; and
- Migration of Dissolved-Phase Contaminants in Groundwater.

Receptors

The following potential receptors were identified:

- Off site residential receptors;
- Shallow groundwater associated with waste deposits; and
- Karst aquifer associated with Bedrock.

4.0 TIER 2 – EXPLORATORY SITE INVESTIGATION WORKS

4.1 OBJECTIVES

The overall objective of the preliminary site investigation was to reduce the uncertainty with regard to the site, by obtaining information on:

- The nature of the waste;
- The volume and extent of waste;
- The presence of any leachate or gas produced within the waste;
- The depth to exposed bedrock beneath the waste;
- The risks posed to the groundwater beneath the site; and
- The risks posed to nearby human health receptors.

4.2 SITE INVESTIGATION STRATEGY

RPS undertook a Tier 2 Exploratory Site Investigation which involved advancing a number of trial pits across the eastern portion of the site with particular emphasis on the embankment area.

The site investigation works were carried out with reference to the following best practice guides for Contaminated Soils and Groundwater site investigations:

- *BS 10175:2011* Investigation of potentially contaminated sites - Code of practice;
- *BS 5930:1999* Code of practice for site investigations (Partially superseded but remains current and is cited in Building Regulations);
- *Contaminated Land Research Report 11* Model procedures for the management of land contamination;
- *ISO standards* for soil and groundwater analysis and sampling;
- Relevant Health and Safety Regulations and Guidance (including the Health, Safety and Welfare at Work Act 2005, and Safety, Health and Welfare at Work (Construction) Regulations 2006, SI 504/06;

- EPA Code of Practice Environmental Risk Assessment for Unregulated Waste Disposal Sites, 2007, and,
- Environment Agency (EA) Guidance on Assessment of Risks from Landfill Sites.

4.3 SITE MANAGEMENT

The site investigation works were carried out by an Environmental Scientist from RPS in conjunction with a 20 tonne tracked excavator operated by a private contractor.

4.4 UNDERGROUND SERVICE LOCATION

No underground site services exist across the site.

4.5 TRIAL PITTING

Seven trial pits (TP01 to TP07) were excavated in the eastern portion/embankment area of the site ranging in depth between 0.5 and 3.7 mbgl. The locations of the trial pits are presented on Figure 7. Trial pit logs are presented in Appendix A.

All trial pits were excavated using a mechanical excavator and were back filled on completion by replacing material in the order in which it was excavated. The following information was recorded during the excavations:

- Material descriptions;
- Groundwater presence;
- Visual evidence and extent of contamination; and,
- Olfactory evidence of contamination.

The geological strata were described from visual inspection of the excavation walls and from the arisings brought to the surface. Particular attention was paid to any evidence of contamination, visual or olfactory, on soil or in groundwater. The number of soil samples taken was dependent upon the variability of materials encountered and the perceived level of contamination.

4.6 CHEMICAL ANALYSIS OF SAMPLES

The laboratory used for chemical analysis of soil and groundwater samples was ALcontrol Laboratories. The laboratory is ISO 17025, UKAS and MCERT accredited. The analytical laboratory results are presented in Appendix B.

The analytical suite of tests used for both soil and groundwater analyses were determined as most suitable to assess environmental risk.

Soil and groundwater samples were analysed for the general suite of parameters listed in Table 4.

Table 4 Summary of Laboratory Analysis

Soil Analysis Suite	Groundwater Analysis Suite	Surface Water Analysis Suite
<ul style="list-style-type: none"> • Heavy Metals • Sulphate, Sulphide, Chloride, Cyanide, Thiocyanate, Asbestos • pH • Organic matter content • Petroleum Hydrocarbons • Polychlorinated Biphenyls (PCBs) • Benzene, Toluene, Ethylbenzene & Xylene (BTEX) • Polycyclic Aromatic Hydrocarbons (PAH) • Volatile Organic Compounds (VOCs) and Semi Volatile Organic Compounds (SVOCs) • Waste Acceptance Criteria (WAC) eluate analysis 	<ul style="list-style-type: none"> • Heavy Metals • Sulphate, Sulphide, Ammoniacal Nitrogen, Chloride, Total Alkalinity, Total Organic Carbon, Total Organic Nitrogen, Sodium, Potassium, Calcium, BOD, COD, Nitrite, Nitrate, Magnesium , Manganese, Phosphate and Chloride • Organic matter content • Petroleum Hydrocarbons • BTEX • Volatile Organic Compounds (VOCs) and Semi Volatile Organic Compounds (SVOCs) • Polycyclic Aromatic Hydrocarbons (PAH) • PCBs • Organochlorine Pesticides • Herbicides • Phenoxy Acid herbicides • Organophosphorous Pesticides 	<ul style="list-style-type: none"> • Heavy Metals • Sulphate, Sulphide, Ammoniacal Nitrogen, Chloride, Total Alkalinity, Total Organic Carbon, Total Organic Nitrogen, Sodium, Potassium, Calcium, BOD, COD, Nitrite, Nitrate, Magnesium , Manganese, Phosphate and Chloride • Organic matter content • Petroleum Hydrocarbons • BTEX • Volatile Organic Compounds (VOCs) and Semi Volatile Organic Compounds (SVOCs) • Polycyclic Aromatic Hydrocarbons (PAH) • PCBs • Organochlorine Pesticides • Herbicides • Phenoxy Acid herbicides • Organophosphorous Pesticides

The soil and groundwater laboratory results are presented in Appendix B.

4.7 ENVIRONMENTAL SOIL SAMPLING

A total of eleven soil investigation samples were collected from the trial pits and sent for laboratory analysis after visual and olfactory screening. The results are presented in Appendix C.

4.8 ENVIRONMENTAL GROUNDWATER & SURFACE WATER SAMPLING

Two grab samples of groundwater were obtained from groundwater ingressing into TP03 and TP05. These results are also presented in Appendix D. The surface drain along the western site boundary was found to be dry and could not be sampled. The spring and small stream outside the north eastern site boundary was also dry on the day of the site investigation.

It is acknowledged that sampling groundwater from trial pits is not considered best practice in accordance with the guidance presented within BS 10175:2011 as ground disturbance may lead to a sample that is not fully representative of the groundwater beneath the site. However the guidance does state that such a sample may be used to provide preliminary information on groundwater quality.

5.0 SUMMARY OF GROUND CONDITIONS ENCOUNTERED

5.1 SUB-SOILS

The ground conditions indicated by the exploratory investigations are described in the exploratory hole logs presented in Appendix A and are briefly summarised below.

The site investigation logs indicate that the site is underlain by the following general sequence:

- Topsoil
- Made Ground
- Glacial Till
- Peat
- Limestone Bedrock

Topsoil

Topsoil was encountered within TP01, TP03A&B, TP04, TP05, TP06 and TP07 to a maximum depth of 0.8m below ground level (bgl).

Made Ground

Made Ground was encountered within TP03A and TP06 to a maximum depth of 1.0m bgl (TP03) and predominantly consisted of;

- Uncompact, grey/brown, silty, gravelly CLAY with boulders, plastic and some metal (consistent with decomposed municipal waste).

Glacial Till

Glacial Till was encountered within TP01, TP03A&B, TP04, TP06 and TP07 to a maximum depth of 3.70m bgl (TP07) and predominantly consisted of;

- Firm to stiff, brown, silty CLAY,
- Very soft, brown, very wet, saturated (almost liquid) CLAY (known locally as 'swimming till',
- Soft to firm, grey, very sandy CLAY,
- Firm to stiff, grey/brown, slightly peaty, silty CLAY with rootlets
- Stiff, grey, silty CLAY with large cobbles and boulders.

Peat

Peat was encountered within TP03B and TP05 which consisted of dark brown/black, spongy, pseudofibrous PEAT.

Bedrock

Limestone bedrock was encountered within TP01, TP02, TP04 and TP06. Bedrock was encountered at the surface in TP02 and at a maximum depth of 2.7m bgl in TP06.

Waste Material

Waste material comprising glass, metal, plastic and tyres was evident on the surface at the locations of TP03A and TP06. Very little surface waste was evident on the surface at the location of TP04. These trial pits (TP03A&B, TP04 and TP06) were advanced within the embankment area. Access to this area was limited due to the heavily overgrown vegetation and also very soft ground conditions which created access difficulties for the excavator. Waste material comprising metal and plastic was only evident within sub-soils in TP03A to a maximum depth of 1.0m bgl but were not evident within TP03B. TP03B was advanced in line with TP03A but at the toe of the embankment and into the field on the other side of the old wire fence. It would appear therefore that waste is confined to the area of the embankment between TP06 and TP04 (Please refer to Figure 2). However due to access restrictions as described, the vertical extent of the waste higher up on the embankment could not be ascertained.

5.2 HYDROGEOLOGY

5.2.1 GROUNDWATER OBSERVATIONS

During the site investigation, groundwater was encountered within four of the seven trial pits and are summarised below.

Table 5 Summary of Water Strikes During Excavation

Exploratory hole	Depth of Water Strikes / Seepages (m.b.g.l)	Summary of Ground Conditions
TP03B	Strike at 0.70m	Very soft, brown, silty, saturated CLAY (swimming till)
TP05	Steady flow at 0.70m	Black spongy pseudofibrous PEAT
TP06	Seepage at 1.20m	Soft grey sandy silty CLAY
TP07	Seepage at 1.20m	Dark grey, loose, fine to medium grained SAND

A very strong flow of groundwater was encountered within the Peat in TP05. Groundwater was observed to fill the pit from 1.8m bgl back up to 0.70m bgl in a time period of 15 minutes.

6.0 GROUND CONTAMINATION

6.1 INTRODUCTION

The results of the laboratory analysis were used to carry out a generic quantitative risk assessment (GQRA).

A summary of the geochemical test results is presented in Appendix C in depth order. Within these tables, those cells with no recorded values, indicate that the samples were not scheduled for that particular suite of analysis.

6.2 RISK ASSESSMENT METHODOLOGY

6.2.1 HUMAN HEALTH RISK ASSESSMENT FRAMEWORK

In the absence of Irish legislation and guidance in relation to human health risk assessment, reference has been made to UK guidance. The UK Environment Agency has published guidance in relation to assessing the potential risk from contaminated land to human health. Science Report SR2 'Human Health Toxicological Assessment of Contaminants in Soil' and Science Report SR3 'Updated Technical Background to the CLEA Model' are intended to replace CLR 9 and 10 respectively and together with CLR 11 'Model Procedures for the Management of Land Contamination' provide the most up to date framework for human health risk assessment within the UK.

CLR10 previously stated that '*the contamination is assumed to be at or within 1m of the surface*' (CLR10 pg 10). SR3 contains a brief discussion of contamination depth on p13 and although it does not specifically mention a depth of 1.0m it states that '*it is assumed that the pollution is at the surface or close to it*' and '*whether or not soil contamination at greater depth or beneath hard standing poses a risk to health depends on the importance of the contact pathways (primarily ingestion and dermal contact) and the likelihood that such soils may be brought to the surface through activities such as gardening or building works*'. For the purpose of this assessment therefore, it is considered that at depths greater than 1m, the probability of human exposure via the direct contact pathways are significantly reduced.

6.2.2 PUBLISHED SOIL GUIDELINE VALUES (SGVs)

In light of the publication of SR2 and SR3 the Environment Agency have published new SGVs for Benzene, Toluene, Ethylbenzene, Xylene, Selenium, Mercury, Arsenic, Cadmium, Phenol, Nickel and Sum of PCDDs, PCDFs and dioxin-like PCBs for the following standard land use scenarios assuming a Sandy Loam soil and Soil Organic Matter (SOM) content of 6%:

- Residential;

- Allotments; and
- Commercial.

In order to assess the soil analysis results with regard to potential human health risks, in the absence of a full compliment of Soil Guideline Values, RPS have used Generic Assessment Criteria derived in accordance with the UK framework.

A commercial end use scenario has been adopted as it is the least conservative in relation to protection of human health and given that the site is currently in agricultural use, this is deemed to be the most appropriate end use scenario for screening purposes.

ATRISKSOIL, LQM/CIEH and CL:AIRE soil screening values have also been published using the updated technical approach outlined within SR2 and SR3 using CLEA v1.04 – 1.06 and a SOM value of 1% for organic contaminants such as PAHs, TPHs, VOCs and SVOCs.

Soil organic matter content has been measured in all samples and returned values ranging from 1.04% to 48.30% and hence due to the significant variation, a conservative approach has been adopted and the generic values derived for a SOM value of 1% have been utilised in the risk assessment where possible.

6.2.3 PUBLISHED GENERIC SITE ASSESSMENT CRITERIA

In order to assess the human health and environmental risks posed by potential contaminants within the underlying soils and groundwater, RPS undertook an initial screen of the laboratory results using Generic Assessment Criteria (GAC). Generic assessment criteria are contaminant concentration values used for comparison purposes to assess the risk associated with contaminant concentrations found on site.

For pollutants with no relevant SGV's, GACs were derived using the following:

- ATRISKSOIL Soil Screening Values,
- LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Edition)¹,
- The Soil Generic Assessment Criteria for Human Health Risk Assessment – CL:AIRE December 2009

The ATRISKSOIL soil screening values have recently been published using the updated technical approach outlined within SR2 and SR3 using CLEA v1.06 and a SOM value of 1% and 6%.

The 2nd edition LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment has recently been updated to reflect the significant changes in human health risk assessment

¹ The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Ed) – 2009.

technical guidance and policy since the release of the first edition. The GACs have been derived using CLEA v1.04 for a range of generic land uses and Soil Organic Matter contents (1%, 2.5% and 6%).

CL:AIRE in association with The Environmental Industries Commission (EIC) and Association of Geotechnical and Geo-environmental Specialists (AGS) have recently published a set of Generic Assessment Criteria for previously unpublished contaminants which are intended to complement the SGVs derived by the Environment Agency and GACs derived by LQM/CIEH. The GACs have been derived predominantly for VOCs and SVOCs using CLEA v1.06 for a number of different Soil Organic Matter contents (1%, 2.5% and 6%).

The results

6.3 DISCUSSION OF THE SOIL CHEMICAL RESULTS

6.3.1 CONTAMINANTS BELOW LABORATORY DETECTION LIMITS

The following soil contaminant concentrations were at or below the method detection limit and have therefore not been considered further within this report;

Free Cyanide, Total Cyanide, Mercury, Total Phenols, PAHs, PCBs, Benzene, MTBE, Ethylbenzene, o-xylene and the majority of all VOCs and SVOCs.

6.3.2 CONTAMINANTS ABOVE DETECTION LIMITS BUT BELOW SGV OR GAC

The following soil contaminants were recorded at concentrations above the method detection limit but below their SGV or GAC value;

Thiocyanate, Chromium VI, Arsenic, Cadmium, Copper, Lead, Nickel, Selenium, Zinc, TPH Aliphatics (C5-44), TPH Aromatics (C5-C44), Toluene, m,p-Xylene and Carbon Disulphide

6.3.3 CONTAMINANTS EXCEEDING SGV OR GAC

All contaminants recorded concentrations below their respective screening values (commercial end-use).

7.0 GROUNDWATER CONTAMINATION

7.1 INTRODUCTION

Groundwater analytical results used as part of the site assessment are presented in Appendix D.

Leachate and groundwater concentrations have been compared in the first instance to the Interim Guideline Values (IGV) for Groundwater as presented in EPA interim report "Towards Setting Guideline Values for the Protection of Groundwater in Ireland" 2002. The IGVs have been selected on the basis of the lowest of either the drinking water standards, environmental quality standards for surface water or GSI trigger values and are therefore protective of all groundwater and surface water receptors. In addition, the recently published 2010 Groundwater Regulations are also used for screening purposes.

There are currently no published generic assessment criteria for groundwater derived specifically to be protective of human health via direct contact. However it can be assumed that if water is considered safe for human consumption then there are no risks from direct contact.

7.2 GROUNDWATER CHEMICAL RESULTS

The majority of contaminants returned concentrations below their respective screening values with the exception of the following;

pH

The pH of the sample from TP03 was recorded at 5.82 which exceeded the IGV range of 6.5 – 9.5.

Chloride

An elevated concentration of Chloride above the IGV of 30.0 mg/l was recorded within both samples;

- 54.8 mg/l in TP03.
- 43.5 mg/l in TP05.

Potassium

An elevated concentration of Potassium above the IGV of 5.0 mg/l was recorded within the following sample;

- 6.30 mg/l in TP03

Manganese

An elevated concentration of Manganese above the IGV of 135 ug/l was recorded within the following sample;

- 135 ug/l in TP03

Polycyclic Aromatic Hydrocarbons (PAHs) – Benzo(k)fluoranthene

An elevated concentration of Benzo(k)fluoranthene above the IGV of 0.05 ug/l was recorded in the following sample;

- 0.275 ug/l in TP03

Polycyclic Aromatic Hydrocarbons (PAHs) – Benzo(a)pyrene

Elevated concentrations of Benzo(a)pyrene above the IGV of 0.01 ug/l were recorded in both samples;

- 0.317 ug/l in TP03,
- 0.027 ug/l in TP05.

Polycyclic Aromatic Hydrocarbons (PAHs) – Benzo(ghi)perylene

An elevated concentration of Benzo(ghi)perylene above the IGV of 0.05 ug/l was recorded in the following sample;

- 0.298 ug/l in TP03

Polycyclic Aromatic Hydrocarbons (PAHs) – Indeno(123cd)pyrene

An elevated concentration of Indeno(123cd)pyrene above the IGV of 0.05 ug/l was recorded in the following sample;

- 0.241 ug/l in TP03.

Polycyclic Aromatic Hydrocarbons (PAHs) – Total 16 PAHs

Elevated concentrations of Total 16 PAHs above the IGV of 0.1 ug/l were recorded in both samples;

- 2.37 ug/l in TP03,
- 0.258 ug/l in TP05.

7.3 SIGNIFICANCE OF GROUNDWATER CHEMICAL RESULTS

In summary, the groundwater grab sample from TP03 has been impacted by Chloride, Potassium, Manganese and a number of PAHs. The sample from TP05 has been impacted by Chloride and a number of PAHs. Due to the limitations of groundwater sampling from trial pits as outlined in Section 4.8, it is difficult to ascertain if the groundwater has been impacted upon by the waste material. PAHs can be naturally elevated in areas underlain by peat however they may also arise from buried waste. The presence of Chloride and PAHs in both samples and the acidic pH in TP03 (where waste was detected) indicate the possibility that groundwater has been impacted by waste. PAHs are formed from the incomplete combustion of carbon containing compounds and are known to be hazardous to human health if consumed in sufficient quantities.

8.0 LANDFILL WASTE ACCEPTANCE CRITERIA

8.1 INTRODUCTION

As part of the investigation, one soil sample from the waste area (TP03) was tested for waste acceptance criteria (BS 12457/3), to give an initial indication of the likely waste classification of the material. The results are presented in Appendix B and were compared to EU guidance for the acceptance of waste at landfills. The following table provides definitions relating to waste acceptance criteria.

Table 6 Definitions of Waste

Waste Type	Definition of Waste Relating to Waste Acceptance Criteria
Inert Waste	Waste is inert if: <ul style="list-style-type: none"> (a) it does not undergo any significant physical, chemical or biological transformations; (b) it does not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health; and, (c) its total leachability and pollutant content and the ecotoxicity of its leachate are insignificant and, in particular, do not endanger the quality of any surface water or groundwater.
Non-Hazardous Waste	Non-hazardous waste is waste which is stable and non-reactive, which means that the leaching behaviour of the waste will not change adversely in the long-term, under landfill design conditions or foreseeable accidents: <ul style="list-style-type: none"> (a) in the waste alone (for example, by biodegradation); (b) under the impact of long-term ambient conditions (for example, water, air, temperature, mechanical constraints), and, (c) by the impact of other wastes (including waste products such as leachate and gas).
Hazardous Waste	Hazardous waste is waste which possesses one or more of the following hazardous properties: explosive, oxidizing, flammable, irritant, harmful, toxic, carcinogenic, corrosive, infection, toxic for reproduction, mutagenic, releases toxic gases in contact with air, water or acid and ecotoxic.
Putrescible Waste	Putrescible waste is any waste which is subject to biological and chemical decomposition or decay.
International Swill	Catering waste containing products of animal origin generated from means of transport operating internationally.

8.2 LEACHATE TEST RESULTS

The results of the WAC test on the sample from TP03 are presented in Table 7.

Table 7 Leachate Test Results

Component 10:1 Leachate	CEN	Leaching Limit Values (mg/kg dry substance)			Leachate Test Results (mg/kg dry substance)
		Inert	non-hazardous	hazardous	TP03 0.5m
Arsenic	0.5	2	25	0.00434	
Barium	20	100	300	0.0381	
Cadmium	0.04	1	5	0.00159	
Chromium	0.5	10	70	0.0189	
Copper	2	50	100	0.138	
Mercury	0.01	0.2	2	0.000272	
Molybdenum	0.5	10	30	<0.0024	
Nickel	0.4	10	40	0.0461	
Lead	0.5	10	50	0.0691	
Antimony	0.06	0.7	5	0.00717	
Selenium	0.1	0.5	7	0.00596	
Zinc	4	50	200	0.226	
Chloride	800	15000	25000	<20	
Fluoride	10	150	500	<5	
Sulphate	1000	20000	50000	<20	
Total Dissolved Solids	4000	60000	100000	284	
Phenol Monohydric	1	-	-	<0.16	
Dissolved Organic Carbon	500	800	1000	139	
Total Organic Carbon (%)	3	5	6	3.26	
Sum of BTEX (ug/kg)	6000	-	-	<0.024	
Sum of PCBs (ug/kg)	1000	-	-	<0.021	
Mineral Oils (mg/kg)	500	-	-	28.2	
PAH Sum of 17 (mg/kg)	100	-	-	<10	

8.3 DISCUSSION OF THE LEACHATE TEST RESULTS

The results of the leachate test indicate that the sample from TP03 would be classified as a non-hazardous waste due to an elevation for Total Organic Carbon. However a marginal exceedance for the Loss on Ignition value of 10.5 % would categorise the waste as Hazardous. Given that the TOC value does not exceed the Hazardous Waste limit of 6%, the waste would be classified overall as non-hazardous.

9.0 RISK ASSESSMENT AND REFINEMENT OF CONCEPTUAL SITE MODEL

Using the methodology outlined in previous sections, the laboratory analytical results were used to carry out a generic quantitative risk assessment (GQRA).

9.1 OVERVIEW OF SOURCES, PATHWAYS AND RECEPTORS

9.1.1 SOURCES – GROUND CONTAMINATION

All contaminants recorded concentrations below the generic screening values derived for a commercial end use.

9.1.2 SOURCES – GROUNDWATER CONTAMINATION

The primary sources of contamination at the site are:

- Shallow groundwater in direct contact with waste containing inorganic, metals and PAHs, and
- Infiltration of precipitation through waste creating leachate run-off.

The two groundwater samples obtained from TP03 and TP05 have recorded concentrations for Chloride, Potassium, Manganese and a number of PAHs above the EPA IGVs. In addition, the sample from TP03 recorded an acidic pH outside of the IGV range. Although it cannot be verified due to the sampling procedure, it is likely that the groundwater samples have been impacted by contaminants within the waste.

9.1.3 SOURCES – GROUND BORNE GASES

The monitoring of soil borne gases did not form part of the scope of the assessment. Given the limited extent and fully decomposed nature of the waste (glass, metal, plastic etc), the potential for gas generation is considered to be low. Significant peat deposits were noted during the investigation which may give rise ground gas.

9.1.4 PATHWAYS

- Pathways associated with impacts to human health through dermal contact, ingestion and dust inhalation are not present on the site as it is currently in agricultural use. In addition, soil contaminant concentrations were recorded below generic screening values for a commercial end use.
- Groundwater is not abstracted for potable use in the immediate area and therefore the pathway for groundwater contamination to impact human health is minimal.

- A pathway exists for rainfall/precipitation to infiltrate from the surface, through the waste and leach into the shallow groundwater.
- A pathway is likely to exist for contaminated shallow groundwater to migrate vertically into the underlying karst limestone aquifer (given the presence of exposed bedrock at the surface adjacent to the waste area).
- A pathway is likely to exist on site for contaminated shallow groundwater to migrate horizontally in a west to north-west direction across the site (given the site topography).
- The surface drain which runs along the western site boundary does not appear to be connected to any streams or rivers. However an un-named stream is located approximately 300m east of the site and the drainage ditch may connect into this stream via a network of field drains.

9.1.5 RECEPTORS

Current Site-Users

The site is in agricultural use (cattle grazing) and therefore human receptors (apart from occasional visits from the landowner/farmer) are not permanently present.

Off-Site Human Health Receptors

Three residential properties are located immediately north of the site. The main risk posed to these receptors is from landfill gas migration. As the monitoring of landfill gases has not been carried out, the risk to these receptors cannot be fully quantified at this stage.

Shallow Perched Groundwater

Shallow groundwater has likely been impacted by contamination from the waste material.

Karst Aquifer

The site is underlain by a regionally important karstified aquifer (Rk) which is at risk from vertical migration of contaminants.

9.2 RISK ASSESSMENT AND REVISED CONCEPTUAL MODEL

A review of the CSM based on the above information indicates that contaminant linkages likely exist on the site in relation to contaminated groundwater. The revised site conceptual model is illustrated in Table 8 and Table 9 summarises the potential contaminant linkages on site.

Table 8 Revised Conceptual Model for the Site

SOURCES
<p>Soils:</p> <ul style="list-style-type: none"> ▪ No soil source zone could be identified <p>Groundwater</p> <ul style="list-style-type: none"> ▪ Chloride, Potassium, Manganese and PAHs in shallow groundwater <p>Ground Gas</p> <ul style="list-style-type: none"> ▪ Potential for gas generation from waste is low however peat deposits may give rise to gas emissions
PATHWAYS
<ul style="list-style-type: none"> ▪ Vertical and Horizontal Migration in Groundwater ▪ Sub-surface Infiltration
RECEPTORS
<p>On-site Receptors:</p> <ul style="list-style-type: none"> ▪ Regionally important Karst aquifer <p>Off-site Receptors:</p> <ul style="list-style-type: none"> • Un-named stream which discharges into McSwines Bay

Table 9 Refined Risk Assessment & Site Conceptual Model

Source	Pathway(s)	Receptors(s)	Relevant Source – Pathway – Receptor Linkage (SPR)	Mitigation Measures/Recommendations
Contaminants in groundwater – Chloride, Potassium, Manganese and PAHs	Subsurface infiltration Leaching and Infiltration Vertical Migration Horizontal Migration off-site	Regionally important Karst aquifer Un-named stream	Medium to High The shallow groundwater appears to have been impacted by contaminants from the waste and it is likely that this is migrating into the underlying karst aquifer.	Yes Given the limitations associated with sampling groundwater from trial pits, additional site investigation and monitoring is necessary to more fully understand the hydrogeological regime beneath the site and extent of contamination. See Section x.x for further details.
Ground Borne Gases	Migration to Indoor Air	Humans in the form of future site users	Low Given the absence of organic and decaying material within the waste, the potential for gas generation is low. However peat deposits in the area may give rise to ground gas.	Yes Although the potential for gas generation is low, the risk cannot be fully quantified and it is recommended that additional site investigation and monitoring of gases be undertaken. See Section 10.2 for further details.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 CONCLUSIONS

An environmental risk assessment has been carried out with respect to an historic landfill at an area of land to the north of Dunkineely. The assessment was undertaken in accordance with the EPA Code of Practice for Environmental Risk Assessment of Unregulated Waste Disposal Sites, 2007, and comprised Tier 1 Preliminary Assessment and Screening; Tier 2 Site investigation and Testing, and Tier 3 Conceptual Model Refinement and Generic Quantitative Risk Assessment.

The assessment has concluded the following:

- Waste material appears to be confined to a narrow strip of land along the eastern embankment.
- Waste material comprising of glass, metal, plastic and tyres was evident on the surface within the overgrown embankment area.
- Waste material comprising metal and plastic was only evident within sub-soils in TP03A to a maximum depth of 1.0m bgl but were not evident within TP03B which was advanced in line with TP03A but at the toe of the embankment and into the field.
- Limestone bedrock was encountered within TP01, TP02, TP04 and TP06. Bedrock was encountered at the surface in TP02 and at a maximum depth of 2.7m bgl in TP06.
- Shallow groundwater was encountered within TP03B, TP05, TP06 and TP07 between 0.70m and 1.20m bgl.
- Chemical analysis of soil results indicated that all samples recorded contaminant concentrations below generic screening values for a commercial end use.
- Chemical analysis of two groundwater 'grab' samples from TP03 and TP05 indicated that a number of contaminants (Chloride, Potassium, Manganese and PAHs) recorded concentrations above the EPA IGVs.
- It is likely that the shallow groundwater has been impacted by contaminants leaching from the waste however due to sampling the groundwater from trial pits, this cannot be fully quantified.

10.2 RECOMMENDATIONS

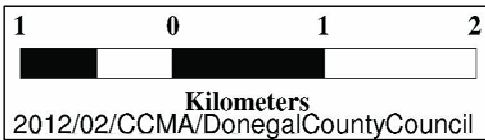
The assessment has provided preliminary indications that shallow groundwater has been impacted by contaminants leaching from the waste. However a number of uncertainties remain which will require further investigation;

- A number of boreholes should be advanced within the site with at least one borehole upstream and downstream of the waste body. Boreholes should be targeted to both

the shallow groundwater and the deeper karst aquifer within the bedrock (to ascertain any impact on the karst aquifer). Caution should be taking during these intrusive works to ensure that new pathways for contaminant migration are not created by drilling into the limestone bedrock.

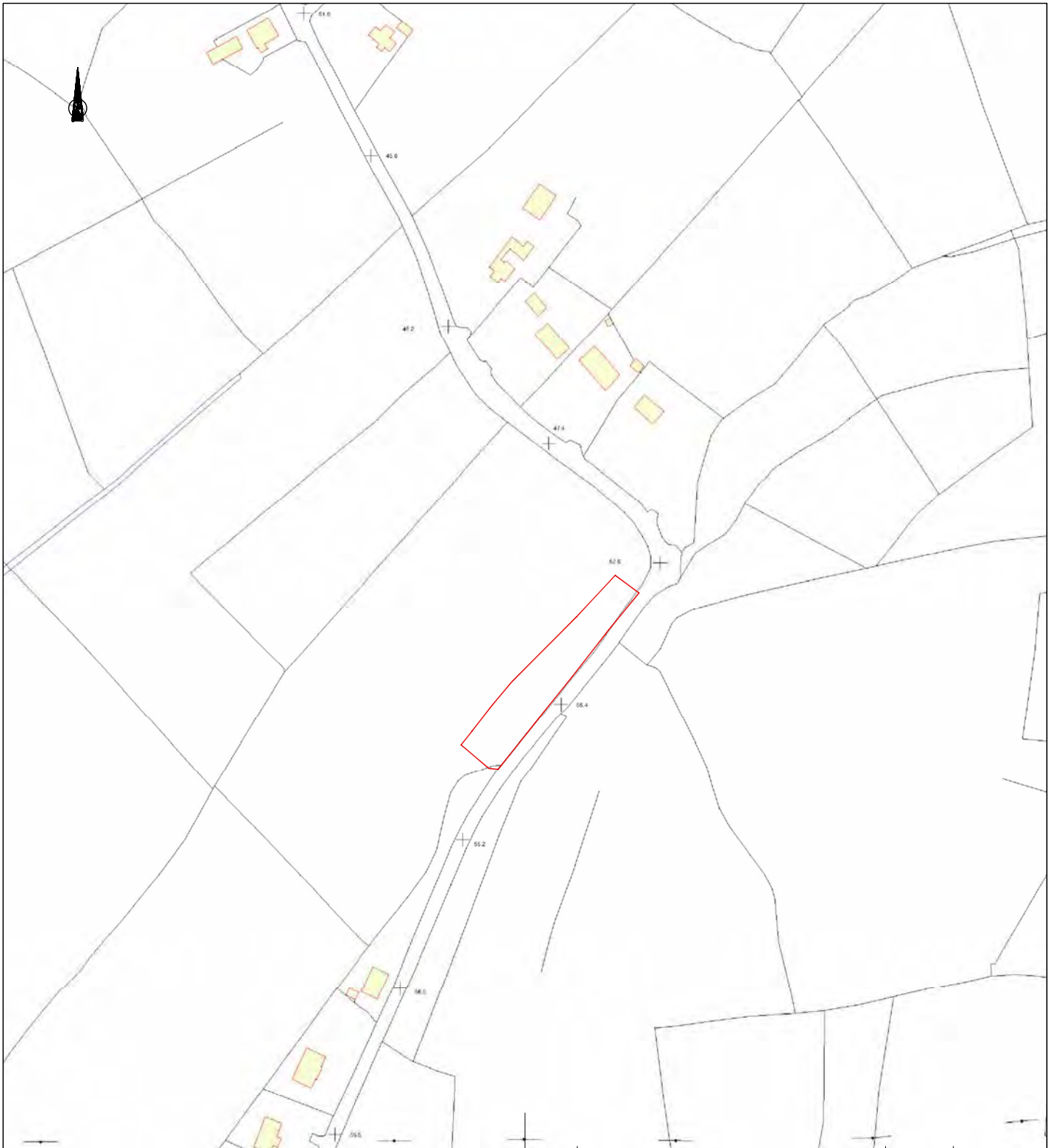
- At least two rounds of monitoring of shallow and deep groundwater should be undertaken for a similar suite of analysis as carried out during this assessment.
- A number of these boreholes should also be used for gas monitoring to assess the gas risk (if any) from the site. At least four rounds of monitoring should be undertaken over at least a one month period with one round at low atmospheric pressure (<1000 mb).
- Although the horizontal extent of the waste along the embankment has been clarified, the vertical extent of the waste higher up on the embankment is unknown. Given the access restrictions (due to the heavily overgrown vegetation and soft ground), it may be necessary to utilise a 'long reach' excavator which is capable of working in soft, peaty ground to access the waste material higher up on the embankment. Alternatively, it may be possible to advance a borehole from the top of the embankment down through the waste which would provide a good profile of the waste material deposited over time. The practicality of either option should be fully explored and assessed before proceeding to site.
- At the time of the investigation, the drainage ditch along the western boundary was dry. However during the initial site walkover in January 2012, this ditch was noted to contain brown coloured water. Therefore this ditch should be checked when carrying out the two groundwater sampling rounds above and sampled if sufficient water is present.
- It is unknown also if the drainage ditch eventually discharges into the un-named stream located 300m west of the site. Further investigation should be carried out in this matter as the stream discharges into the unpolluted McSwines Bay.
- The conceptual model of the site and the risk assessment should be updated and modified depending on the outcome of the additional investigation and monitoring.

FIGURES




rev	amendments	drawn	date
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 Elmwood House 74 Boucher Road Belfast BT12 6RZ T +44 (0) 28 90 667914 F +44 (0) 28 90 668286 W www.rpsgroup.com/ireland E ireland@rpsgroup.com	Drawing Number <h2 style="text-align: center;">IBR0384 / Fig 1</h2>		Rev <p style="text-align: center;">-</p>				
	Project <h3 style="text-align: center;">Dunkineely GQRA</h3>		Title <h3 style="text-align: center;">Site Location</h3>				
Client <h3 style="text-align: center;">Donegal County Council</h3>		Architect					
Drawing Status Preliminary	Sheet Size A4	Drawing Scale 1:50,000	<table border="1" style="width: 100%;"> <tr> <td>Project Leader K McN</td> <td>Drawn By P McM</td> <td>Date 26/06/2012</td> <td>Initial Review J McG</td> </tr> </table>	Project Leader K McN	Drawn By P McM	Date 26/06/2012	Initial Review J McG
Project Leader K McN	Drawn By P McM	Date 26/06/2012	Initial Review J McG				

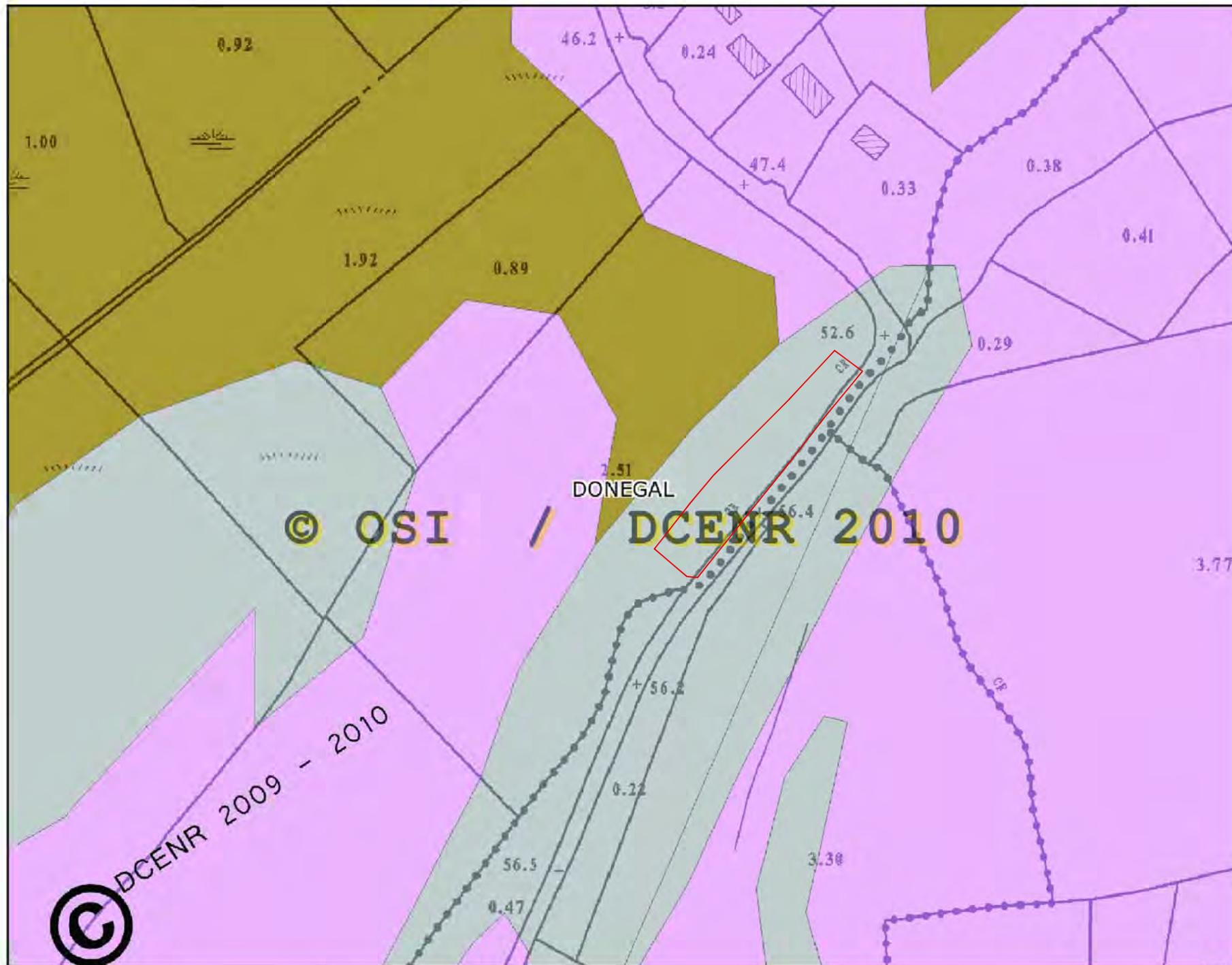


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		IBR0384 /Fig 2	-			
Project Dunkineely Landfill GQRA	Title Existing Site Layout					
Client Donegal County Council	Architect					
Drawing Status Preliminary	Sheet Size A4	Drawing Scale 1:2,500	Project Leader K McN	Drawn By P McM	Date 25/06/2012	Initial Review J McG



Geological Survey of Ireland - Groundwater



- ### Legend
- RBD Subsoils**
- Alluvium
 - Beach sands and gravels
 - Bedrock outcrop and subcrop
 - Esker sands and gravels
 - Glaciofluvial sands and gravels
 - Lake sediments
 - Made ground
 - Marine/estuarine silts and clays
 - Marsh
 - Peat
 - Scree
 - Till derived chiefly from Devonian sandstones
 - Till derived chiefly from Lower Palaeozoic rocks
 - Till derived chiefly from Namurian rocks
 - Till derived chiefly from granite
 - Till derived chiefly from limestone
 - Till derived chiefly from metamorphic rocks
 - Till derived from metamorphic rocks
 - Till derived from mixed Devonian and Carboniferous rocks
 - Water
 - Windblown sands
 - County Boundaries
 - Watermark



Map center: 176879, 376428

Snapshot Date: 21-Jun-2012

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Client
 Donegal County Council

Project
 Dunkineely Landfill Site GQRA

Title
 Drift Geology

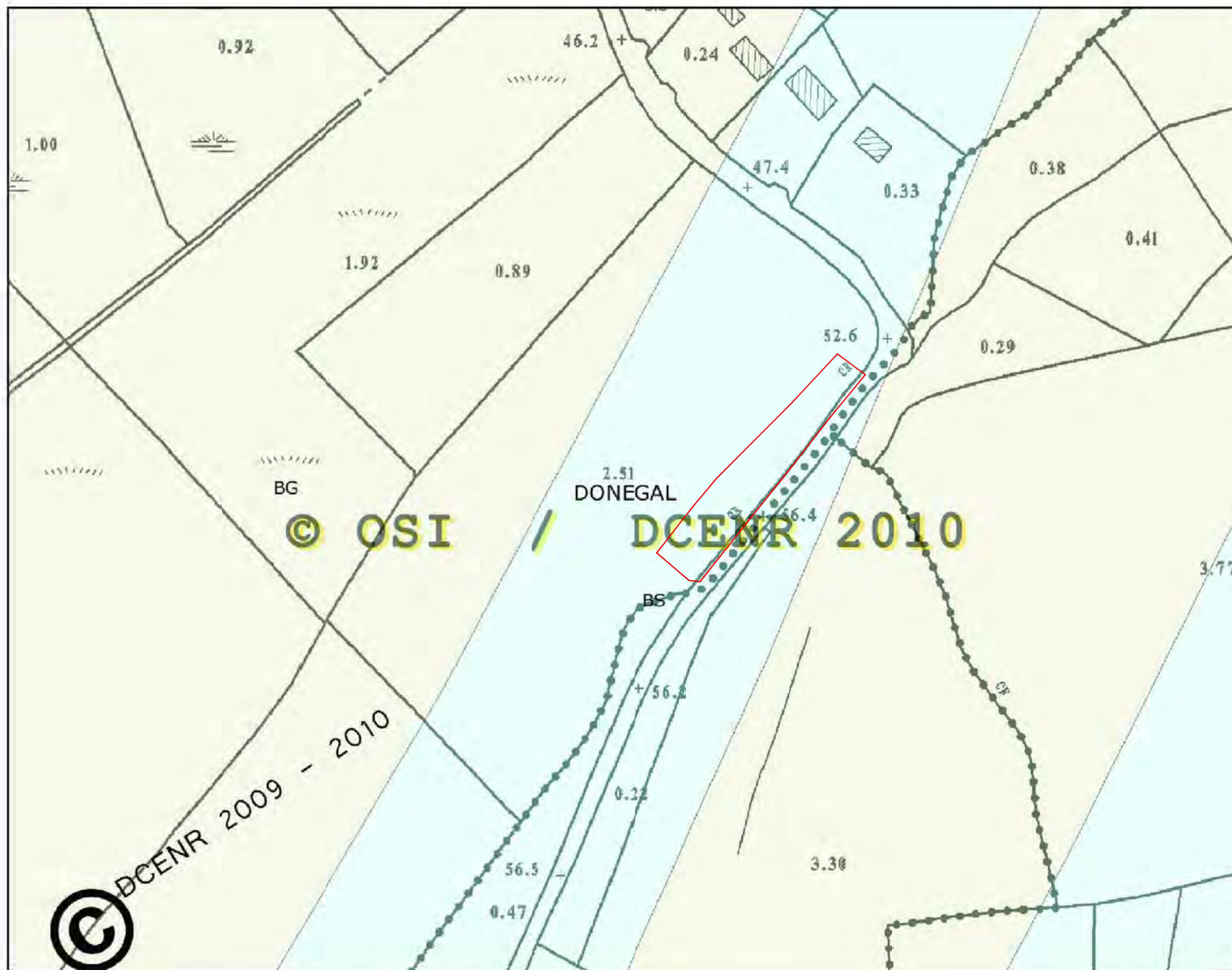
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Preliminary	A3	N.T.S.

Drawing Number	Rev
IBR0384 /Fig 3	-

Project Leader	Drawn By	Date	Initial Review
K McN	P McM	25/06/2012	J McG



Geological Survey of Ireland - Groundwater



Legend

Bedrock 100k Solid Geology

- AA - Aille and Barney Fms (undifferentiated)
- AA - Allen Andesite Formation
- AAwp - Westport Oolite
- AB - South Achillbeg Formation
- ABcg - Achillbeg Conglomerate Member
- ABps - Achillbeg Lighthouse Psammite Member
- ABsl - Achillbeg School Black Slate Member
- AD - Aghaward Formation
- AD - Ardagh Shale Formation
- AD - Ardenagh Formation
- AD - Ashleam Bridge Dolomitic Formation
- AE - Aghamore Formation
- AE - Ardane Formation
- AG - Addergoole River Formation
- AG - Aghfarrell Formation
- AG - Aghmacart Formation
- AGdh - Dowery Hill Member
- AGdo - Aghmacart Formation
- AH - Achill Head Formation
- AH - Arklow Head Formation
- AHfv - in Arklow Head Formation
- AI - Aille Limestone Formation
- AK - Askingarran Formation
- AL - Altan Limestone Formation
- AL - Annascaul Formation
- AL - Argillaceous Limestones (Visean)
- ALmk - in Argillaceous Limest (Visean)
- AN - Anaftrin Formation
- AN - Annabella Formation
- ANGm - Glennamong Member
- ANrd - Old Road Member
- AP - Ards Pelite Formation
- AP - Ashleam Head Formation
- AQ - Ards Quartzite Formation
- AQ - Ashleam Bridge Quartzite Formation
- AQgr - Ashleam Bridge Graphitic Member
- AR - Ardvarney Formation
- AR - Ayle River Formation
- ARM - Armagh Group
- AS - Ardnasillagh Formation
- AS - Ashleam Bay Formation



Map center: 176879, 376428

Snapshot Date: 21-Jun-2012

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Client
 Donegal County Council

Project
 Dunkineely Landfill Site GQRA

Title
 Solid Geology

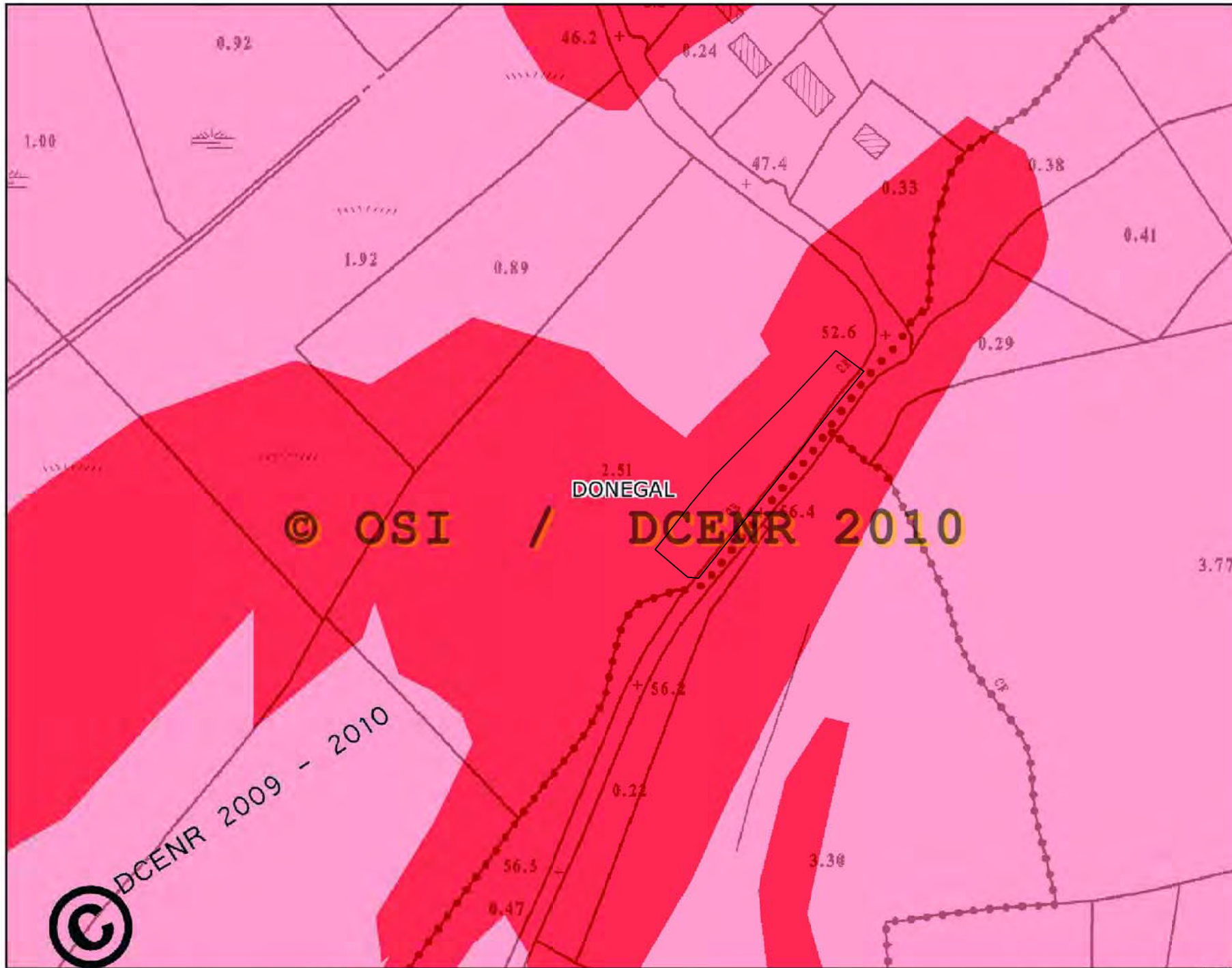
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Preliminary	A3	N.T.S.

Drawing Number	Rev
IBR0384 /Fig 4	-

Project Leader	Drawn By	Date	Initial Review
K McN	P McM	25/06/2012	J McG



Geological Survey of Ireland - Groundwater



Legend

Vulnerability

- X (Rock near Surface or Karst)
- E - Extreme
- H - High
- M - Moderate
- L - Low
- HL - High to Low. Only an interim study took place.
- Water
- No Data Available
- County Boundaries
- Watermark



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Client
Donegal County Council

Project
Dunkineely Landfill Site GQRA

Title
Groundwater Vulnerability

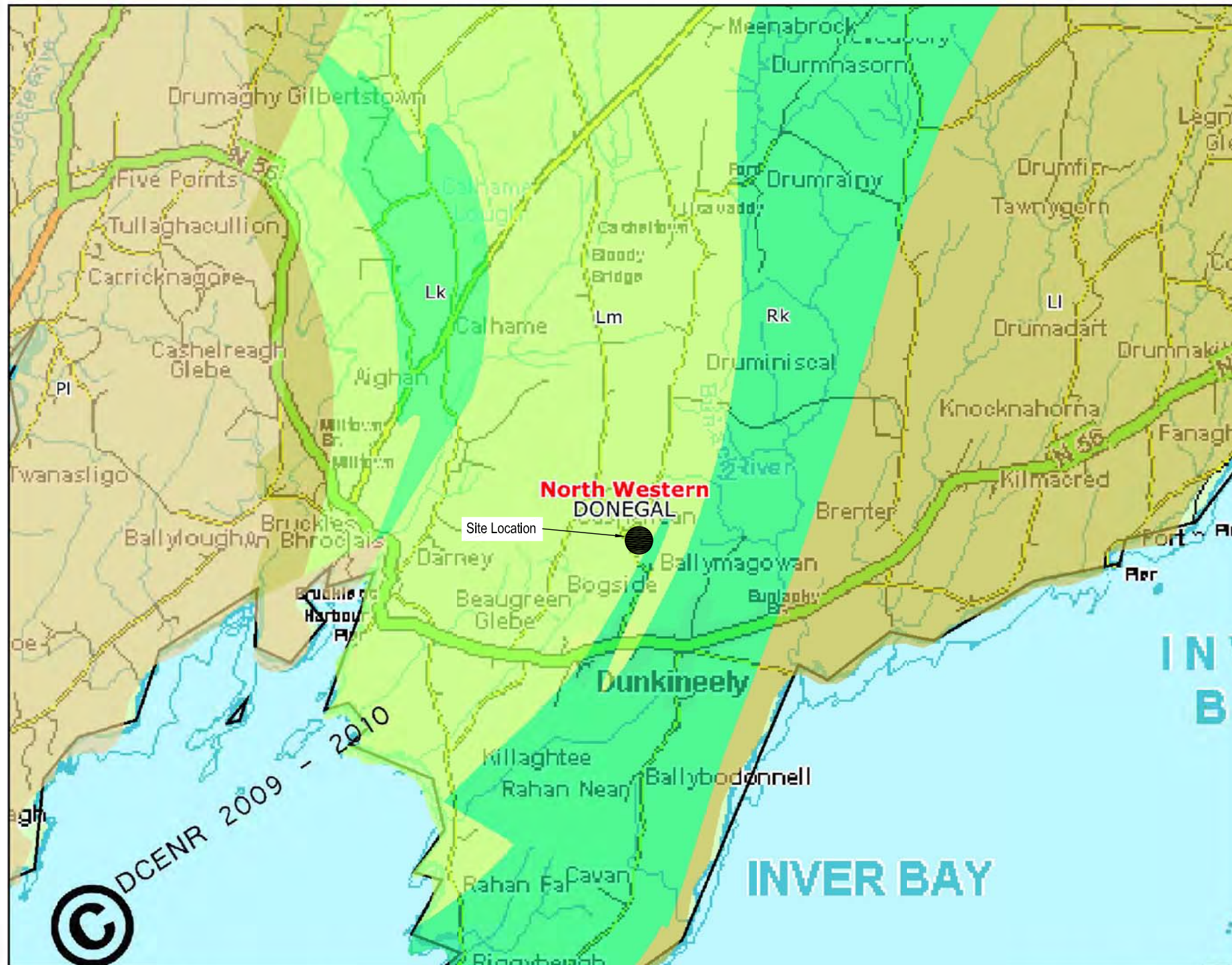
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Drawing Number IBR0384 /Fig 5	Rev -
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Project Leader K McN	Drawn By P McM	Date 25/06/2012	Initial Review J McG
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Geological Survey of Ireland - Groundwater



Legend

National Draft Bedrock Aquifer Map

- Rf - Regionally Important Aquifer - Fissured bedrock
- Rk - Regionally Important Aquifer - Karstified
- Rkd - Regionally Important Aquifer - Karstified (diffuse)
- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Lk - Locally Important Aquifer - Karstified
- LI - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- PI - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Unclassified

RBD Boundaries
 County Boundaries

- ### NOTES
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Project
Dunkineely Landfill Site GQRA

Title
Hydrogeology

Drawing Status	Sheet Size	Drawing Scale
Preliminary	A3	N.T.S.

Drawing Number
IBR0384 /Fig 6

Rev
-

Project Leader	Drawn By	Date	Initial Review
K McN	P McM	25/06/2012	J McG

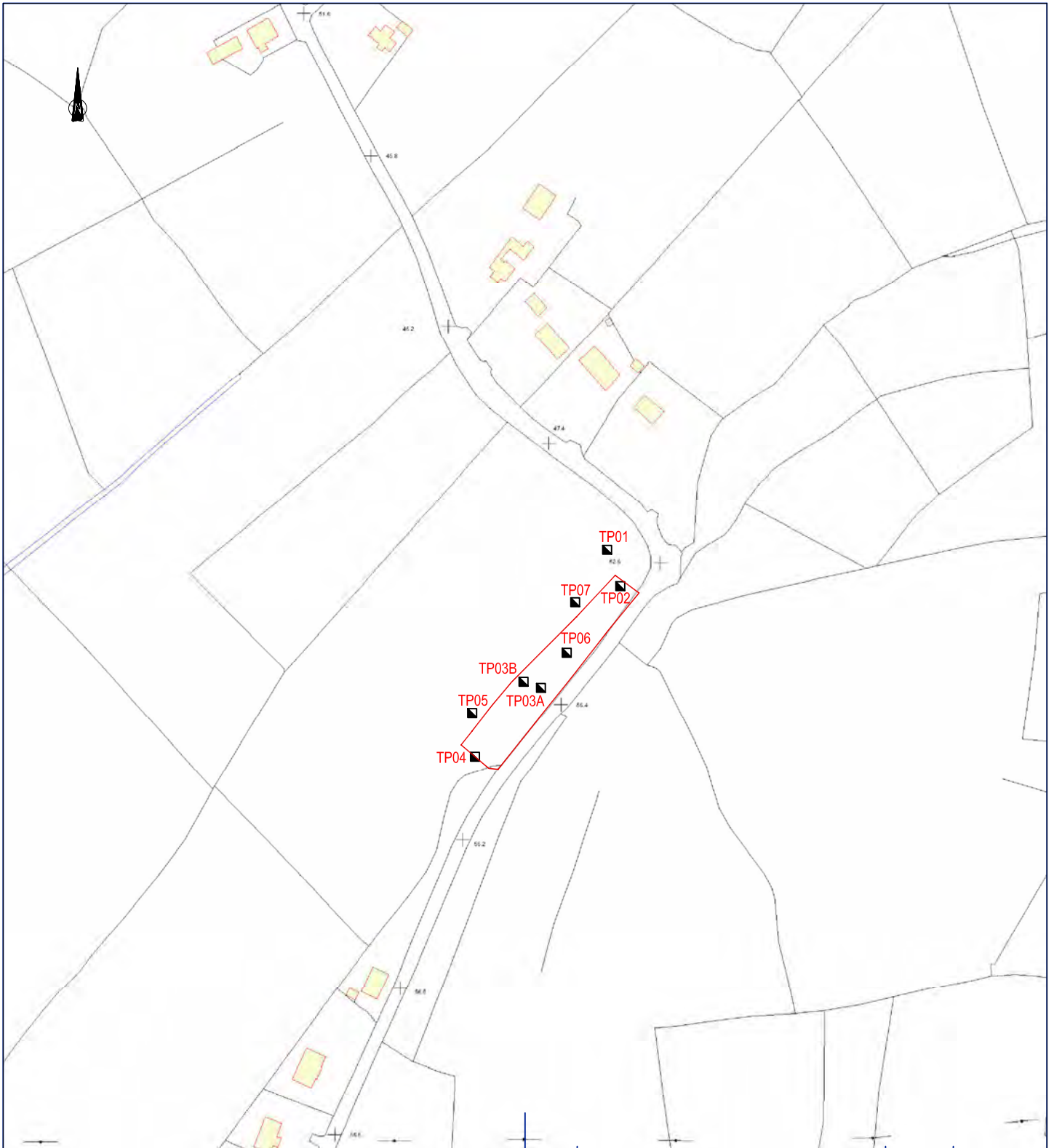
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		IBR0384 /Fig 7	-

Project Dunkineely Landfill GQRA	Title Trial Pit Locations
--	-------------------------------------

Client Donegal County Council	Architect
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Drawing Status Preliminary	Sheet Size A4	Drawing Scale 1:2,500	Project Leader K McN	Drawn By P McM	Date 27/03/2012	Initial Review J McG
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APPENDIX A
TRIAL PIT LOGS

RPS
74 Boucher Road
Belfast
BT12 6RZ
Tel: 028 9066 7914

Trialpit No
01
Sheet 1 of 1

Project Name
Dunkineely Historic Landfill

Project No.
IBR0384

Co-ords: -
Level: -

Date
02/05/2012

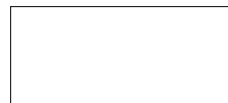
Location: Dunkineely

Dimensions: -


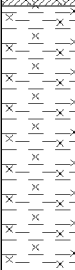

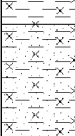
Scale
1:25

Client: Donegal County Council

Depth
1.80m



Logged By
J McGrath

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.30			TOPSOIL
						Firm to stiff grey brown slightly sandy silty CLAY with rootlets
			1.20			Firm to stiff brown silty CLAY
			1.40			Very soft brown very wet saturated almost liquid CLAY
			1.80			Trialpit Complete at 1.80 m

Remarks: TP terminated on Bedrock

Groundwater: No groundwater encountered



RPS
74 Boucher Road
Belfast
BT12 6RZ
Tel: 028 9066 7914

Trialpit No
02
Sheet 1 of 1

Project Name
Dunkineely Historic Landfill

Project No.
IBR0384

Co-ords: -
Level: -

Date
02/05/2012

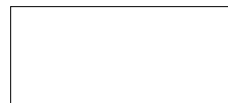
Location: Dunkineely

Dimensions: -


Scale
1:25

Client: Donegal County Council

Depth
0.50m



Logged By
J McGrath

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.50			Large rocks and boulders, light to dark grey, crystalline limestone Trialpit Complete at 0.50 m
						1
						2
						3
						4

Remarks: TP terminated on bedrock

Groundwater: No groundwater encountered



RPS
74 Boucher Road
Belfast
BT12 6RZ
Tel: 028 9066 7914

Trialpit No
03A
Sheet 1 of 1

Project Name
Dunkineely Historic Landfill

Project No.
IBR0384

Co-ords: -
Level: -

Date
02/05/2012

Location: Dunkineely

Dimensions: -


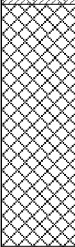
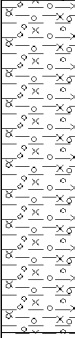
Scale
1:25

Client: Donegal County Council

Depth
2.10m



Logged By
J McGrath

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			TOPSOIL
						MADE GROUND: Uncompact grey brown silty gravelly CLAY with boulders. Also some metal and plastics
			1.00			Very soft brown very wet silty CLAY with boulders
			2.10			Trialpit Complete at 2.10 m

Remarks: TP terminated due to groundwater ingress from TP03B

Groundwater: No groundwater encountered



RPS
74 Boucher Road
Belfast
BT12 6RZ
Tel: 028 9066 7914

Trialpit No
03B
Sheet 1 of 1

Project Name
Dunkineely Historic Landfill

Project No.
IBR0384

Co-ords: -
Level: -

Date
02/05/2012

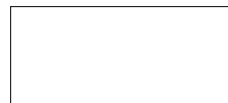
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Dimensions: -




Scale
1:25

Client: Donegal County Council

Depth
0.90m



Logged By
J McGrath

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			TOPSOIL
			0.70			Dark brown spongy pseudofibrous PEAT
			0.90			Very soft brown very wet saturated almost liquid CLAY
Trialpit Complete at 0.90 m						

Remarks: TP Terminated due to Groundwater Ingress

Groundwater: Strike at 0.70m



RPS
 74 Boucher Road
 Belfast
 BT12 6RZ
 Tel: 028 9066 7914

Trialpit No
04
 Sheet 1 of 1

Project Name
 Dunkineely Historic Landfill

Project No.
 IBR0384

Co-ords: -
 Level: -

Date
 02/05/2012

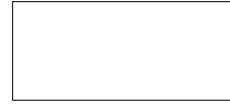
Location: Dunkineely

Dimensions: -



Scale
 1:25

Client: Donegal County Council

Depth
 1.30m



Logged By
 J McGrath

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.80			Black peaty Topsoil with large boulders	
			1.30			Soft to firm grey very sandy CLAY	-1
<p style="text-align: center;">Trialpit Complete at 1.30 m</p>							
							-2
							-3
							-4

Remarks: TP terminated on Bedrock

Groundwater: No Groundwater encountered



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 74 Boucher Road
 Belfast
 BT12 6RZ
 Tel: 028 9066 7914

Trialpit No
05
 Sheet 1 of 1

Project Name Dunkineely Historic Landfill	Project No. IBR0384	Co-ords: - Level: -	Date 02/05/2012
Location: Dunkineely		Dimensions: - Depth 1.80m	Scale 1:25
Client: Donegal County Council			Logged By J McGrath

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.70			Very black peaty Topsoil with large boulders and fibrous roots	
			1.80			Black spongy pseudofibrous PEAT	
						Trialpit Complete at 1.80 m	

Remarks: TP terminated due to groundwater ingress and pitwall instability

Groundwater: Groundwater stirke at 0.7. Very strong flow from eastern pitwall (adjacent to embankment). Groundwater filled pit from 1.8m to 0.7m in 15 minutes



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 74 Boucher Road
 Belfast
 BT12 6RZ
 Tel: 028 9066 7914

Trialpit No
06
 Sheet 1 of 1

Project Name
 Dunkineely Historic Landfill

Project No.
 IBR0384

Co-ords: -
 Level: -

Date
 02/05/2012

Location: Dunkineely

Dimensions: -

Scale
 1:25

Client: Donegal County Council

Depth
 2.70m



Logged By
 J McGrath

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.50			TOPSOIL with some surface waste: plastics, glass, metal and tyres
			0.80			Uncompact grey brown sandy gravelly CLAY with boulders
			1.20			Very soft brown very wet CLAY
			2.70			Soft grey sandy silty CLAY
						Trialpit Complete at 2.70 m

Remarks: TP terminated on bedrock

Groundwater: Groundwater seepage at 1.2m



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74 Boucher Road
Belfast
BT12 6RZ
Tel: 028 9066 7914

Trialpit No
07
Sheet 1 of 1

Project Name
Dunkineely Historic Landfill

Project No.
IBR0384

Co-ords: -
Level: -

Date
02/05/2012

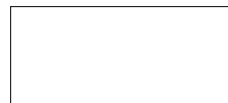
Location: Dunkineely

Dimensions: -

Scale
1:25

Client: Donegal County Council

Depth
3.70m



Logged By
J McGrath

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.10						TOPSOIL	
						Firm to stiff grey brown slightly peaty silty CLAY with rootlets	
1.20						Dark grey loose fine to medium grained SAND	
1.60						Firm to stiff grey brown slightly peaty silty CLAY with rootlets	
2.60						Stiff grey silty CLAY with some large cobbles and boulders	
3.70						Trialpit Complete at 3.70 m	

Remarks: TP terminated on excavator reach

Groundwater: Groundwater seepage at 1.2m



APPENDIX B
LABORATORY ANALYTICAL RESULTS



RPS Consultants Ltd
Elmwood House
74 Boucher Road
Belfast

Attention: Joseph McGrath

CERTIFICATE OF ANALYSIS

Date: 16 May 2012
Customer: D_RPSCON_BFT
Sample Delivery Group (SDG): 120504-110
Your Reference:
Location: Dunkineely
Report No: 181268

We received 13 samples on Thursday May 03, 2012 and 13 of these samples were scheduled for analysis which was completed on Wednesday May 16, 2012. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan
Operations Manager





SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
5544988	TP01		0.80	02/05/2012
5544990	TP01		1.60	02/05/2012
5545000	TP03			02/05/2012
5544991	TP03		0.50	02/05/2012
5544992	TP03		1.60	02/05/2012
5544993	TP04		0.80	02/05/2012
5544994	TP04		1.20	02/05/2012
5545001	TP05			02/05/2012
5544995	TP05		1.00	02/05/2012
5544996	TP06		0.60	02/05/2012
5544997	TP06		1.80	02/05/2012
5544998	TP07		1.20	02/05/2012
5544999	TP07		2.80	02/05/2012

Only received samples which have had analysis scheduled will be shown on the following pages.



SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:































LIQUID Results Legend <input checked="" type="checkbox"/> Test <input checked="" type="checkbox"/> No Determination Possible	Lab Sample No(s)	5545000	5545001
	Customer Sample Reference	TP03	TP05
	AGS Reference		
	Depth (m)		
	Container	1l green glass bottle 1l plastic (ALE221) NaOH (ALE245) Vial (ALE297)	1l green glass bottle 1l plastic (ALE221) NaOH (ALE245)
Acid Herbicides (W)	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Alkalinity as CaCO3	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Anions by Kone (w)	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
BOD True Total	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
COD Unfiltered	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Easily Liberated Sulphide	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Fluoride	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Free Sulphur	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
GRO by GC-FID (W)	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/>



SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:

LIQUID Results Legend  Test  No Determination Possible	Lab Sample No(s)		5545000	5545001
	Customer Sample Reference		TP03	TP05
	AGS Reference			
	Depth (m)			
	Container		1l green glass bottle	1l green glass bottle	NaOH (ALE245) 1l plastic (ALE221) 1 green glass bottle Vial (ALE297) NaOH (ALE245) 1l plastic (ALE221)
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2		
Kjeldahl Nitrogen on liquids	All	NDPs: 0 Tests: 2		
Mercury Dissolved	All	NDPs: 0 Tests: 2		
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 2		
Nitrite by Kone (w)	All	NDPs: 0 Tests: 2		
OC, OP Pesticides and Triazine Herb	All	NDPs: 0 Tests: 2		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 2		
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 2		
pH Value	All	NDPs: 0 Tests: 2		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 2		
Suspended Solids	All	NDPs: 0 Tests: 2		
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 2		
Total Nitrogen	All	NDPs: 0 Tests: 2		
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 2		
TPH CWG (W)	All	NDPs: 0 Tests: 2		



CERTIFICATE OF ANALYSIS

Validated

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

LIQUID Results Legend <input checked="" type="checkbox"/> Test <input type="checkbox"/> No Determination Possible	Lab Sample No(s)	5545000	5545001
	Customer Sample Reference	TP03	TP05
	AGS Reference		
	Depth (m)		
	Container	1l green glass bottle	1l green glass bottle
VOC MS (W)	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/>



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath



Order Number: 240453380
Report Number: 181268
Superseded Report:

LIQUID Results Legend <input checked="" type="checkbox"/> Test <input type="checkbox"/> No Determination Possible	Lab Sample No(s)		5545001
	Customer Sample Reference		TP05
	AGS Reference		
	Depth (m)		
	Container		Vial (ALE297)
GRO by GC-FID (W)	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/>
VOC MS (W)	All	NDPs: 0 Tests: 2	<input checked="" type="checkbox"/>

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

SOLID Results Legend  Test  No Determination Possible	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	
		5544988	TP01		0.80	250g Amber Jar (AL 400g Tub (ALE214))
		5544990	TP01		1.60	250g Amber Jar (AL 400g Tub (ALE214))
		5544991	TP03		0.50	250g Amber Jar (AL 60g VOC (ALE215))
		5544992	TP03		1.60	250g Amber Jar (AL 400g Tub (ALE214))
	5544993	TP04		0.80	250g Amber Jar (AL 400g Tub (ALE214))	
	5544994	TP04		1.20	250g Amber Jar (AL 400g Tub (ALE214))	
	5544995	TP05		1.00	250g Amber Jar (AL 400g Tub (ALE214))	
	5544996	TP06		0.60	250g Amber Jar (AL 400g Tub (ALE214))	
	5544997	TP06		1.80	250g Amber Jar (AL 400g Tub (ALE214))	
	5544998	TP07		1.20	250g Amber Jar (AL 60g VOC (ALE215))	
	5544999	TP07		2.80	250g Amber Jar (AL 400g Tub (ALE214))	
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1				
Anions by Kone (soil)	All	NDPs: 1 Tests: 10				
Anions by Kone (w)	All	NDPs: 0 Tests: 1				
Asbestos Identification (Soil)	All	NDPs: 0 Tests: 11				
Boron Water Soluble	All	NDPs: 0 Tests: 11				
CEN 2:1 Readings	All	NDPs: 0 Tests: 1				
CEN 8:1 Readings	All	NDPs: 0 Tests: 1				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 11				
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1				
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1				
Easily Liberated Sulphide	All	NDPs: 0 Tests: 11				
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 11				
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 11				
Fluoride	All	NDPs: 0 Tests: 1				
GRO by GC-FID (S)	All	NDPs: 0 Tests: 11				



SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:

SOLID Results Legend Test No Determination Possible	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	
		5544988	TP01		0.80	250g Amber Jar (AL)
		5544990	TP01		1.60	60g VOC (ALEE215)
		5544991	TP03		0.50	400g Tub (ALEE214)
		5544992	TP03		1.60	60g VOC (ALEE215)
	5544993	TP04		0.80	400g Tub (ALEE214)	
	5544994	TP04		1.20	60g VOC (ALEE215)	
	5544995	TP05		1.00	250g Amber Jar (AL)	
	5544996	TP06		0.60	400g Tub (ALEE214)	
	5544997	TP06		1.80	60g VOC (ALEE215)	
	5544998	TP07		1.20	250g Amber Jar (AL)	
	5544999	TP07		2.80	400g Tub (ALEE214)	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 11				
Loss on Ignition in soils	All	NDPs: 0 Tests: 1				
Mercury Dissolved	All	NDPs: 0 Tests: 1				
Metals by iCap-OES (Soil)	Arsenic	NDPs: 0 Tests: 11				
	Cadmium	NDPs: 0 Tests: 11				
	Chromium	NDPs: 0 Tests: 11				
	Copper	NDPs: 0 Tests: 11				
	Lead	NDPs: 0 Tests: 11				
	Mercury	NDPs: 0 Tests: 11				
	Nickel	NDPs: 0 Tests: 11				
	Selenium	NDPs: 0 Tests: 11				
	Zinc	NDPs: 0 Tests: 11				
Mineral Oil	All	NDPs: 0 Tests: 11				
PAH Value of soil	All	NDPs: 0 Tests: 11				
PCBs by GCMS	All	NDPs: 0 Tests: 8				



SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:

SOLID Results Legend Test No Determination Possible	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	
		5544988	TP01		0.80	250g Amber Jar (AL)
		5544990	TP01		1.60	400g Tub (ALEE214)
		5544991	TP03		0.50	250g Amber Jar (AL)
		5544992	TP03		1.60	60g VOC (ALEE215)
	5544993	TP04		0.80	400g Tub (ALEE214)	
	5544994	TP04		1.20	60g VOC (ALEE215)	
	5544995	TP05		1.00	250g Amber Jar (AL)	
	5544996	TP06		0.60	400g Tub (ALEE214)	
	5544997	TP06		1.80	60g VOC (ALEE215)	
	5544998	TP07		1.20	250g Amber Jar (AL)	
	5544999	TP07		2.80	400g Tub (ALEE214)	
pH	All	NDPs: 0 Tests: 11				
Phenols by HPLC (S)	All	NDPs: 0 Tests: 11				
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1				
Sample description	All	NDPs: 0 Tests: 11				
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 11				
Solvent Extract	All	NDPs: 0 Tests: 11				
Total Dissolved Solids	All	NDPs: 0 Tests: 1				
Total Organic Carbon	All	NDPs: 0 Tests: 11				
Total Sulphate	All	NDPs: 0 Tests: 11				
Total Sulphur	All	NDPs: 0 Tests: 11				
TPH CWG GC (S)	All	NDPs: 0 Tests: 11				
VOC MS (S)	All	NDPs: 0 Tests: 11				



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
5544988	TP01	0.80	Light Brown	Silt Loam	0.063 - 0.1 mm	Stones	Vegetation
5544990	TP01	1.60	Light Brown	Silt Loam	<0.063 mm	Stones	N/A
5544991	TP03	0.50	Dark Brown	Top Soil	0.063 - 0.1 mm	Vegetation	N/A
5544992	TP03	1.60	Light Brown	Silt Loam	<0.063 mm	Vegetation	Stones
5544993	TP04	0.80	Dark Brown	Sandy Silt Loam	0.063 - 0.1 mm	Vegetation	N/A
5544994	TP04	1.20	Light Brown	Silt Loam	<0.063 mm	Stones	N/A
5544995	TP05	1.00	Black	Silt Loam	0.063 - 0.1 mm	Vegetation	N/A
5544996	TP06	0.60	Dark Brown	Silt Loam	0.063 - 0.1 mm	Vegetation	Stones
5544997	TP06	1.80	Light Brown	Silt Loam	<0.063 mm	Stones	N/A
5544998	TP07	1.20	Dark Brown	Loamy Sand	0.063 - 0.1 mm	Vegetation	N/A
5544999	TP07	2.80	Dark Brown	Silty Clay Loam	0.063 - 0.1 mm	Stones	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Results Legend			Customer Sample R	TP01	TP01	TP03	TP03	TP03	TP04
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP01	TP01	TP03	TP03	TP03	TP04
M	mCERTS accredited.			0.80	1.60		0.50	1.60	0.80
S	Deviating sample.			Soil/Solid	Soil/Solid	Water(GW/SW)	Soil/Solid	Soil/Solid	Soil/Solid
aq	Aqueous / settled sample.			02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted test.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012
	Trigger breach confirmed			120504-110	120504-110	120504-110	120504-110	120504-110	120504-110
(F)				5544988	5544990	5545000	5544991	5544992	5544993
Component	LOD/Units	Method							
Suspended solids, Total	<2 mg/l	TM022			29100				
Alkalinity, Total as CaCO3	<2 mg/l	TM043			90.5				
BOD, unfiltered	<1 mg/l	TM045			<5				
Organic Carbon, Total	<3 mg/l	TM090			11.6				
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099			<0.2				
Fluoride	<0.5 mg/l	TM104			<0.5				
COD, unfiltered	<7 mg/l	TM107			1900				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120			0.268				
Arsenic (diss.filt)	<0.12 µg/l	TM152			0.478				
Boron (diss.filt)	<9.4 µg/l	TM152			48.2				
Cadmium (diss.filt)	<0.1 µg/l	TM152			0.276				
Chromium (diss.filt)	<0.22 µg/l	TM152			3.16				
Copper (diss.filt)	<0.85 µg/l	TM152			3.6				
Lead (diss.filt)	<0.02 µg/l	TM152			0.939				
Manganese (diss.filt)	<0.04 µg/l	TM152			135				
Nickel (diss.filt)	<0.15 µg/l	TM152			2.69				
Selenium (diss.filt)	<0.39 µg/l	TM152			0.677				
Zinc (diss.filt)	<0.41 µg/l	TM152			50				
Mercury (diss.filt)	<0.01 µg/l	TM183			<0.01				
Nitrite as NO2	<0.05 mg/l	TM184			2.12				
Sulphate	<2 mg/l	TM184			28.6				
Chloride	<2 mg/l	TM184			54.8				
Phosphate (ortho) as PO4	<0.05 mg/l	TM184			<0.05				
Nitrate as NO3	<0.3 mg/l	TM184			6.64				
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184			2.15				
PCB congener 118	<0.015 µg/l	TM197			<0.015				
PCB congener 77	<0.015 µg/l	TM197			<0.015				
PCB congener 81	<0.015 µg/l	TM197			<0.015				
PCB congener 105	<0.015 µg/l	TM197			<0.015				
PCB congener 114	<0.015 µg/l	TM197			<0.015				
PCB congener 123	<0.015 µg/l	TM197			<0.015				
PCB congener 126	<0.015 µg/l	TM197			<0.015				
PCB congener 156	<0.015 µg/l	TM197			<0.015				
PCB congener 157	<0.015 µg/l	TM197			<0.015				
PCB congener 167	<0.015 µg/l	TM197			<0.015				



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Results Legend			Customer Sample R		TP01	TP01	TP03	TP03	TP03	TP04
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.80	1.60		0.50	1.60	0.80
M	mCERTS accredited.				Soil/Solid	Soil/Solid		Soil/Solid	Soil/Solid	Soil/Solid
§	Deviating sample.				02/05/2012	02/05/2012		02/05/2012	02/05/2012	02/05/2012
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.						Water(GW/SW)			
tot.unfilt	Total / unfiltered sample.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery				03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012
(F)	Trigger breach confirmed				120504-110	120504-110	120504-110	120504-110	120504-110	120504-110
					5544988	5544990	5545000	5544991	5544992	5544993
Component	LOD/Units	Method								
PCB congener 169	<0.015 µg/l	TM197					<0.015			
PCB congener 189	<0.015 µg/l	TM197					<0.015			
Nitrogen, Kjeldahl	<1 mg/l	TM212					<1			
Organic nitrogen, Total	<1 mg/l	TM212					<1			
Nitrogen, Total	<1 mg/l	TM212					2.81			
Cyanide, Total	<0.05 mg/l	TM227					<0.05			
Thiocyanate	<0.05 mg/l	TM227					0.259			
Calcium (diss.filt)	<0.012 mg/l	TM228					23.9			
Sodium (diss.filt)	<0.076 mg/l	TM228					32.8			
Magnesium (diss.filt)	<0.036 mg/l	TM228					4.34			
Potassium (diss.filt)	<2.335 mg/l	TM228					6.32			
Iron (diss.filt)	<0.019 mg/l	TM228					0.551			
Sulphide, Easily liberated	<0.1 mg/l	TM239					<0.1			
Chromium, Hexavalent	<0.03 mg/l	TM241					<0.03			
pH	<1 pH Units	TM256					5.82			
Phenol	<0.002 mg/l	TM259					<0.002			
Cresols	<0.006 mg/l	TM259					<0.006			
Xylenols	<0.008 mg/l	TM259					<0.008			
2,3,5-Trimethylphenol	<0.003 mg/l	TM259					<0.003			
2-Isopropylphenol	<0.006 mg/l	TM259					<0.006			
Phenols, Total Detected 5 speciated	<0.025 mg/l	TM259					<0.025			
Sulphur, Free	<0.05 mg/l	TM294					<0.15			
Moisture content ratio	%	PM024			23	38		40	23	75
Solvent Extractable Matter (SEM)	<100 mg/kg	TM004			206	110		1070	167	6410
Loss on ignition	<0.7 %	TM018						10.5		
Mineral oil >C10-C40	<1 mg/kg	TM061			14.3	15.4		28.2	13.2	136
Surrogate Value	-	TM061			40.6	40		41.3	39.6	43.1
Mineral Oil Surrogate % recovery**	%	TM061			81.2	80.1		82.5	79.2	86.2
Phenol	<0.01 mg/kg	TM062 (S)			<0.01	<0.01		<0.01	<0.01	0.04
Cresols	<0.01 mg/kg	TM062 (S)			<0.01	<0.01		<0.01	<0.01	<0.01
Xylenols	<0.015 mg/kg	TM062 (S)			<0.015	<0.015		<0.015	<0.015	<0.015
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)			<0.01	<0.01		<0.01	<0.01	<0.01
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)			<0.015	<0.015		<0.015	<0.015	<0.015
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)			<0.06	<0.06		<0.06	<0.06	<0.06
Organic Carbon, Total	<0.2 %	TM132						3.26		



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Results Legend			Customer Sample R		TP01	TP01	TP03	TP03	TP03	TP04
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.80	1.60		0.50	1.60	0.80
M	mCERTS accredited.			Soil/Solid	Soil/Solid	Water(GW/SW)	Soil/Solid	Soil/Solid	Soil/Solid	
§	Deviating sample.			02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	
aq	Aqueous / settled sample.			03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	
diss.filt	Dissolved / filtered sample.			120504-110	120504-110	120504-110	120504-110	120504-110	120504-110	
tot.unfilt	Total / unfiltered sample.			5544988	5544990	5545000	5544991	5544992	5544993	
*	Subcontracted test.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
(F)	Trigger breach confirmed									
Component	LOD/Units	Method								
Sulphur, Total	<0.02 %	TM132		0.0482	0.0669		0.0651	0.0456	0.586	
				#	#		#	#	#	#
Soil Organic Matter (SOM)	<0.35 %	TM132		1.61	1.49			1.04	48.3	
				#	#			#	#	#
pH	1 pH Units	TM133		6.37	6.37		6.55	6.66	5.92	
				M	M		M	M	M	M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6	<0.6		<3	<1.2	<0.6	
				#	#		#	#	#	#
Cyanide, Total	<1 mg/kg	TM153		<1	<1		<1	<1	<1	
				M	M		M	M	M	M
Cyanide, Free	<1 mg/kg	TM153		<1	<1		<1	<1	<1	
				M	M		M	M	M	M
Cyanide, Complex	<1 mg/kg	TM153		<1	<1		<1	<1	<1	
Thiocyanate	<1 mg/kg	TM153		<1	<1		3.5	<1	8.73	
				M	M		M	M	M	M
PCB congener 28	<3 µg/kg	TM168					<3			
							M			
PCB congener 52	<3 µg/kg	TM168					<3			
							M			
PCB congener 101	<3 µg/kg	TM168					<3			
							M			
PCB congener 118	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 138	<3 µg/kg	TM168					<3			
							M			
PCB congener 153	<3 µg/kg	TM168					<3			
							M			
PCB congener 180	<3 µg/kg	TM168					<3			
							M			
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168					<21			
PCB congener 81	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 77	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 123	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 114	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 105	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 126	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 167	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 156	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 157	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 169	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
PCB congener 189	<3 µg/kg	TM168		<3			<3	<3	<3	
				M			M	M	M	M
Sum of detected WHO 12 PCBs	<36 µg/kg	TM168		<36			<36	<36	<36	
Sulphide, Easily liberated	<15 mg/kg	TM180		<15	<15		<15	<15	<15	
				§ #	#		#	#	#	§ #
Arsenic	<0.6 mg/kg	TM181		7.17	18.7		4.23	4.11	4.44	
				M	M		M	M	M	M
Cadmium	<0.02 mg/kg	TM181		0.698	3.05		1.43	0.533	1.05	
				M	M		M	M	M	M
Chromium	<0.9 mg/kg	TM181		23.4	27		12.2	15.4	9.05	
				M	M		M	M	M	M
Copper	<1.4 mg/kg	TM181		36.3	63.5		44.9	14.1	19.5	
				M	M		M	M	M	M
Lead	<0.7 mg/kg	TM181		24	74.3		105	25	18	
				M	M		M	M	M	M
Mercury	<0.14 mg/kg	TM181		<0.14	<0.14		<0.14	<0.14	<0.14	
				M	M		M	M	M	M



CERTIFICATE OF ANALYSIS

Validated

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Table with columns: Results Legend, Customer Sample R, TP01, TP01, TP03, TP03, TP03, TP04. Rows include Component, LOD/Units, Method, and various chemical analysis results for Nickel, Selenium, Zinc, etc.



CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Results Legend			Customer Sample R	TP04	TP05	TP05	TP06	TP06	TP07
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.20		1.00	0.60	1.80	1.20
M	mCERTS accredited.			Soil/Solid	Water(GW/SW)	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
S	Deviating sample.			02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted test.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012
	Trigger breach confirmed			120504-110	120504-110	120504-110	120504-110	120504-110	120504-110
(F)				5544994	5545001	5544995	5544996	5544997	5544998
Component	LOD/Units	Method							
Suspended solids, Total	<2 mg/l	TM022		1050					
Alkalinity, Total as CaCO3	<2 mg/l	TM043		180	#				
BOD, unfiltered	<1 mg/l	TM045		<5	#				
Organic Carbon, Total	<3 mg/l	TM090		4.43	#				
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		<0.2	#				
Fluoride	<0.5 mg/l	TM104		<0.5	#				
COD, unfiltered	<7 mg/l	TM107		468	#				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.431	#				
Arsenic (diss.filt)	<0.12 µg/l	TM152		0.435	#				
Boron (diss.filt)	<9.4 µg/l	TM152		27.8	#				
Cadmium (diss.filt)	<0.1 µg/l	TM152		<0.1	#				
Chromium (diss.filt)	<0.22 µg/l	TM152		4.58	#				
Copper (diss.filt)	<0.85 µg/l	TM152		<0.85	#				
Lead (diss.filt)	<0.02 µg/l	TM152		0.133	#				
Manganese (diss.filt)	<0.04 µg/l	TM152		0.47	#				
Nickel (diss.filt)	<0.15 µg/l	TM152		1.01	#				
Selenium (diss.filt)	<0.39 µg/l	TM152		2.11	#				
Zinc (diss.filt)	<0.41 µg/l	TM152		1.21	#				
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01	#				
Nitrite as NO2	<0.05 mg/l	TM184		<0.05	#				
Sulphate	<2 mg/l	TM184		25.1	#				
Chloride	<2 mg/l	TM184		43.5	#				
Phosphate (ortho) as PO4	<0.05 mg/l	TM184		<0.05	#				
Nitrate as NO3	<0.3 mg/l	TM184		8.27	#				
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184		1.87	#				
PCB congener 118	<0.015 µg/l	TM197		<0.015					
PCB congener 77	<0.015 µg/l	TM197		<0.015					
PCB congener 81	<0.015 µg/l	TM197		<0.015					
PCB congener 105	<0.015 µg/l	TM197		<0.015					
PCB congener 114	<0.015 µg/l	TM197		<0.015					
PCB congener 123	<0.015 µg/l	TM197		<0.015					
PCB congener 126	<0.015 µg/l	TM197		<0.015					
PCB congener 156	<0.015 µg/l	TM197		<0.015					
PCB congener 157	<0.015 µg/l	TM197		<0.015					
PCB congener 167	<0.015 µg/l	TM197		<0.015					



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Results Legend		Customer Sample R	TP04	TP05	TP05	TP06	TP06	TP07
#	ISO17025 accredited.		1.20		1.00	0.60	1.80	1.20
M	mCERTS accredited.	Soil/Solid	Water(GW/SW)	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
S	Deviating sample.	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012
aq	Aqueous / settled sample.	Date Sampled	Date Sampled	Date Sampled	Date Sampled	Date Sampled	Date Sampled	Date Sampled
diss.filt	Dissolved / filtered sample.	Sample Time	Sample Time	Sample Time	Sample Time	Sample Time	Sample Time	Sample Time
tot.unfilt	Total / unfiltered sample.	Date Received	Date Received	Date Received	Date Received	Date Received	Date Received	Date Received
tot.unfilt	Subcontracted test.	SDG Ref	SDG Ref	SDG Ref	SDG Ref	SDG Ref	SDG Ref	SDG Ref
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)	Lab Sample No.(s)
(F)	Trigger breach confirmed	AGS Reference	AGS Reference	AGS Reference	AGS Reference	AGS Reference	AGS Reference	AGS Reference
Component	LOD/Units	Method						
PCB congener 169	<0.015 µg/l	TM197		<0.015				
PCB congener 189	<0.015 µg/l	TM197		<0.015				
Nitrogen, Kjeldahl	<1 mg/l	TM212		<1				
Organic nitrogen, Total	<1 mg/l	TM212		<1				
Nitrogen, Total	<1 mg/l	TM212		2.25				
Cyanide, Total	<0.05 mg/l	TM227		<0.05	#			
Thiocyanate	<0.05 mg/l	TM227		<0.05	#			
Calcium (diss.filt)	<0.012 mg/l	TM228		79.5	#			
Sodium (diss.filt)	<0.076 mg/l	TM228		25.6	#			
Magnesium (diss.filt)	<0.036 mg/l	TM228		5.39	#			
Potassium (diss.filt)	<2.335 mg/l	TM228		2.43	#			
Iron (diss.filt)	<0.019 mg/l	TM228		0.0229	#			
Sulphide, Easily liberated	<0.1 mg/l	TM239		<0.1				
Chromium, Hexavalent	<0.03 mg/l	TM241		<0.03	#			
pH	<1 pH Units	TM256		7.63	#			
Phenol	<0.002 mg/l	TM259		<0.002	#			
Cresols	<0.006 mg/l	TM259		<0.006	#			
Xylenols	<0.008 mg/l	TM259		<0.008	#			
2,3,5-Trimethylphenol	<0.003 mg/l	TM259		<0.003	#			
2-Isopropylphenol	<0.006 mg/l	TM259		<0.006	#			
Phenols, Total Detected 5 speciated	<0.025 mg/l	TM259		<0.025				
Sulphur, Free	<0.05 mg/l	TM294		<0.06				
Moisture content ratio	%	PM024	27		84	45	29	29
Solvent Extractable Matter (SEM)	<100 mg/kg	TM004	254	#	8820	1690	136	2120
Mineral oil >C10-C40	<1 mg/kg	TM061	37.8	#	58	61.8	16.7	62.4
Surrogate Value	-	TM061	44.9	#	47.9	44.8	41.2	42.9
Mineral Oil Surrogate % recovery**	%	TM061	89.8		95.9	89.5	82.4	85.9
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M	0.063	<0.01	<0.01	0.0141
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M	<0.01	<0.01	<0.01	<0.01
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M	<0.015	<0.015	<0.015	<0.015
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M	<0.01	<0.01	<0.01	<0.01
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M	<0.015	<0.015	<0.015	<0.015
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M	<0.06	<0.06	<0.06	<0.06
Sulphur, Total	<0.02 %	TM132	0.0986	#	0.781	0.154	0.131	0.188
Soil Organic Matter (SOM)	<0.35 %	TM132	3.09	#	77.6	10.7	2.12	5.24



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Results Legend			Customer Sample R		TP04	TP05	TP05	TP06	TP06	TP07
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		1.20		1.00	0.60	1.80	1.20
M	mCERTS accredited.			Soil/Solid	Water(GW/SW)	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
§	Deviating sample.			02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012
aq	Aqueous / settled sample.									
diss.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
**	Subcontracted test.									
	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012
(F)	Trigger breach confirmed			120504-110	120504-110	120504-110	120504-110	120504-110	120504-110	120504-110
				5544994	5545001	5544995	5544996	5544997	5544998	5544998
Component	LOD/Units	Method								
pH	1 pH Units	TM133	5.97		6.64	6.19	8.04	5.92		
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#	<1.2	<1.2	<0.6	<3	#	#
Cyanide, Total	<1 mg/kg	TM153	<1	M	<1	<1	<1	<1	M	M
Cyanide, Free	<1 mg/kg	TM153	<1	M	<1	<1	<1	<1	M	M
Cyanide, Complex	<1 mg/kg	TM153	<1		<1	<1	<1	<1		
Thiocyanate	<1 mg/kg	TM153	<1	M	3.55	6.44	<1	1.14	M	M
PCB congener 118	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 81	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 77	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 123	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 114	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 105	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 126	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 167	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 156	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 157	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 169	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
PCB congener 189	<3 µg/kg	TM168	<3	M	<3	<3		<3	M	M
Sum of detected WHO 12 PCBs	<36 µg/kg	TM168	<36		<36	<36		<36		
Sulphide, Easily liberated	<15 mg/kg	TM180	<15	§ #	<15	<15	<15	<15	#	#
Arsenic	<0.6 mg/kg	TM181	5.02	M	<0.6	4.32	6.06	2.44	M	M
Cadmium	<0.02 mg/kg	TM181	0.416	M	0.354	0.774	0.761	0.432	M	M
Chromium	<0.9 mg/kg	TM181	19.3	M	1.62	19.1	19.6	6.38	M	M
Copper	<1.4 mg/kg	TM181	17.6	M	9.12	28.2	134	6.31	M	M
Lead	<0.7 mg/kg	TM181	23.1	M	1.21	23	21.5	4.93	M	M
Mercury	<0.14 mg/kg	TM181	<0.14	M	<0.14	<0.14	<0.14	<0.14	M	M
Nickel	<0.2 mg/kg	TM181	25.8	M	9.3	15.4	24.4	6.51	M	M
Selenium	<1 mg/kg	TM181	<1	#	2.93	2.78	<1	<1	#	#
Zinc	<1.9 mg/kg	TM181	172	M	6.95	97.8	268	41.2	M	M
Polyaromatic hydrocarbons, Total 17	<10 mg/kg	TM213	<10		<10	<10	<10	<10		
Sulphate, acid soluble (total)	<0.02 %	TM221	0.0382		0.187	0.164	0.0322	0.04		
Total sulphur	<0.0016 %	TM221	0.0127		0.0623	0.0548	0.0107	0.0133		
Boron, water soluble	<1 mg/kg	TM222	<1	M	3.95	<1	<1	<1	M	M
Soluble Sulphate 2:1 extract as SO4 BRE	<0.003 g/l	TM243	0.0383	M		0.0743	0.0214	0.133	M	M



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Results Legend		Customer Sample R		TP07				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.80 Soil/Solid 02/05/2012 . 03/05/2012 120504-110 5544999					
M	mCERTS accredited.							
S	Deviating sample.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units	Method						
Moisture content ratio	%	PM024	20					
Solvent Extractable Matter (SEM)	<100 mg/kg	TM004	<100	#				
Mineral oil >C10-C40	<1 mg/kg	TM061	35.4	#				
Surrogate Value	-	TM061	45.8					
Mineral Oil Surrogate % recovery**	%	TM061	91.7					
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	M				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	M				
2,3,5-Trimethylphenol	<0.01 mg/kg	TM062 (S)	<0.01	M				
2-Isopropylphenol	<0.015 mg/kg	TM062 (S)	<0.015	M				
Phenols, Total Detected 5 speciated	<0.06 mg/kg	TM062 (S)	<0.06	M				
Sulphur, Total	<0.02 %	TM132	0.146	#				
Soil Organic Matter (SOM)	<0.35 %	TM132	1.66	#				
pH	1 pH Units	TM133	8.2	M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#				
Cyanide, Total	<1 mg/kg	TM153	<1	M				
Cyanide, Free	<1 mg/kg	TM153	<1	M				
Cyanide, Complex	<1 mg/kg	TM153	<1					
Thiocyanate	<1 mg/kg	TM153	<1	M				
Sulphide, Easily liberated	<15 mg/kg	TM180	<15	§ #				
Arsenic	<0.6 mg/kg	TM181	6.03	M				
Cadmium	<0.02 mg/kg	TM181	0.79	M				
Chromium	<0.9 mg/kg	TM181	21.7	M				
Copper	<1.4 mg/kg	TM181	31.8	M				
Lead	<0.7 mg/kg	TM181	18.5	M				
Mercury	<0.14 mg/kg	TM181	<0.14	M				
Nickel	<0.2 mg/kg	TM181	37.8	M				
Selenium	<1 mg/kg	TM181	<1	#				
Zinc	<1.9 mg/kg	TM181	159	M				
Polyaromatic hydrocarbons, Total 17	<10 mg/kg	TM213	<10					
Sulphate, acid soluble (total)	<0.02 %	TM221	0.0398					
Total sulphur	<0.0016 %	TM221	0.0133					
Boron, water soluble	<1 mg/kg	TM222	<1	M				
Soluble Sulphate 2:1 extract as SO4 BRE	<0.003 g/l	TM243	0.0298	M				



CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Acid Herbicides (W)

Results Legend			Customer Sample R		TP03		TP05				
#	ISO17025 accredited.		Depth (m)								
M	mCERTS accredited.		Sample Type	Water(GW/SW)	Water(GW/SW)						
S	Deviating sample.		Date Sampled	02/05/2012	02/05/2012						
aq	Aqueous / settled sample.		Sample Time								
diss.filt	Dissolved / filtered sample.		Date Received	03/05/2012	03/05/2012						
tot.unfilt	Total / unfiltered sample.		SDG Ref	120504-110	120504-110						
**	Subcontracted test.		Lab Sample No.(s)	5545000	5545001						
	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		AGS Reference								
(F)	Trigger breach confirmed										
Component	LOD/Units	Method									
Phenoxyacetic acid (PAA)	<0.031 µg/l	TM186	<0.155	#	<0.155	#					
Dicamba	<0.033 µg/l	TM186	<0.165	#	<0.165	#					
Phenoxypropionic acid (PPA)	<0.023 µg/l	TM186	<0.115		<0.115						
4-Chlorophenoxyacetic acid (4-CPA)	<0.037 µg/l	TM186	<0.185	#	<0.185	#					
4-Phenoxybutyric acid	<0.019 µg/l	TM186	<0.095	#	<0.095	#					
Bentazone	<0.018 µg/l	TM186	<0.09	#	<0.09	#					
Bromoxynil	<0.022 µg/l	TM186	<0.11		<0.11						
2,4-Dichlorophenoxy acetic acid (2,4-D)	<0.026 µg/l	TM186	<0.13	#	<0.13	#					
2-methyl-4-Chlorophenoxy acetic acid (MCPA)	<0.03 µg/l	TM186	<0.15	#	<0.15	#					
2-methyl-4,6-Dinitrophenol	<0.041 µg/l	TM186	<0.205		<0.205						
Triclopyr	<0.022 µg/l	TM186	<0.11	#	<0.11	#					
Ioxynil	<0.017 µg/l	TM186	<0.085		<0.085						
2,4-Dichlorophenoxy acetic acid (2,4-DP)	<0.015 µg/l	TM186	<0.075	#	<0.075	#					
2,4,5-Trichlorophenol (2,4,5-T)	<0.029 µg/l	TM186	<0.145	#	<0.145	#					
Mecoprop (MCP)	<0.025 µg/l	TM186	<0.125	#	<0.125	#					
4-(2,4-Dichlorophenoxy) butyric acid (2,4-D)	<0.022 µg/l	TM186	<0.11	#	<0.11	#					
4-(4-Chloro-o-tolyloxy) butyric acid (MCPB)	<0.029 µg/l	TM186	<0.145	#	<0.145	#					
2-(2,4,5-Trichlorophenoxy) propionic acid	<0.024 µg/l	TM186	<0.12	#	<0.12	#					
Dinoseb	<0.027 µg/l	TM186	<0.135		<0.135						
Pentachlorophenol	<0.032 µg/l	TM186	<0.16		<0.16						



SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:

OC, OP Pesticides and Triazine Herb

Results Legend		Customer Sample R	TP03	TP05		
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference				
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)		
S	Deviating sample.		02/05/2012	02/05/2012		
aq	Aqueous / settled sample.					
diss.filt	Dissolved / filtered sample.					
tot.unfilt	Total / unfiltered sample.					
*	Subcontracted test.		03/05/2012	03/05/2012		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		120504-110	120504-110		
(F)	Trigger breach confirmed		5545000	5545001		
Component	LOD/Units		Method			
Atrazine	<1 µg/l	TM231	<4	<1		
Simazine	<1 µg/l	TM231	<4	<1		
Dichlorvos	<0.01 µg/l	TM231	<0.04	<0.01		
Mevinphos	<0.01 µg/l	TM231	<0.04	<0.01		
Tecnazene	<0.01 µg/l	TM231	<0.04	<0.01		
Hexachlorobenzene	<0.01 µg/l	TM231	<0.04	<0.01		
Trifluralin	<0.01 µg/l	TM231	<0.04	<0.01		
alpha-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.04	<0.01		
Quintozene (PCNB)	<0.01 µg/l	TM231	<0.04	<0.01		
Diazinon	<0.01 µg/l	TM231	<0.04	<0.01		
Triallate	<0.01 µg/l	TM231	<0.04	<0.01		
Etrimphos	<0.01 µg/l	TM231	<0.04	<0.01		
gamma-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.04	<0.01		
Disulfoton	<0.01 µg/l	TM231	<0.04	<0.01		
Propetamphos	<0.01 µg/l	TM231	<0.04	<0.01		
Heptachlor	<0.01 µg/l	TM231	<0.04	<0.01		
Chlorpyrifos methyl	<0.01 µg/l	TM231	<0.04	<0.01		
Dimethoate	<0.01 µg/l	TM231	<0.04	<0.01		
Aldrin	<0.01 µg/l	TM231	<0.04	<0.01		
Chlorothalonil	<0.01 µg/l	TM231	<0.08	<0.02		
Pirimiphos-methyl	<0.01 µg/l	TM231	<0.04	<0.01		
beta-Hexachlorocyclohexane (HCH / Lindane)	<0.01 µg/l	TM231	<0.04	<0.01		
Chlorpyrifos	<0.01 µg/l	TM231	<0.04	<0.01		
Telodrin	<0.01 µg/l	TM231	<0.04	<0.01		
Methyl parathion	<0.01 µg/l	TM231	<0.04	<0.01		
Isodrin	<0.01 µg/l	TM231	<0.04	<0.01		
Malathion	<0.01 µg/l	TM231	<0.04	<0.01		
Fenthion	<0.01 µg/l	TM231	<0.04	<0.01		
Fenitrothion	<0.01 µg/l	TM231	<0.04	<0.01		
Heptachlor epoxide	<0.01 µg/l	TM231	<0.04	<0.01		
Triadimefon	<0.01 µg/l	TM231	<0.04	<0.01		
Pendimethalin	<0.01 µg/l	TM231	<0.04	<0.01		
Parathion	<0.01 µg/l	TM231	<0.04	<0.01		
o,p-DDE	<0.01 µg/l	TM231	<0.04	<0.01		
Chlorfenvinphos	<0.01 µg/l	TM231	<0.04	<0.01		

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

OC, OP Pesticides and Triazine Herb

Results Legend			Customer Sample R	TP03	TP05			
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference					
M	mCERTS accredited.							
§	Deviating sample.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
Component	LOD/Units	Method						
Endosulphan I	<0.01 µg/l	TM231		<0.04	<0.01			
Trans-chlordane	<0.01 µg/l	TM231		<0.04	<0.01			
cis-Chlordane	<0.01 µg/l	TM231		<0.04	<0.01			
p,p-DDE	<0.01 µg/l	TM231		<0.04	<0.01			
Dieldrin	<0.01 µg/l	TM231		<0.04	<0.01			
o,p-TDE (DDD)	<0.01 µg/l	TM231		<0.04	<0.01			
Endrin	<0.01 µg/l	TM231		<0.04	<0.01			
o,p-DDT	<0.01 µg/l	TM231		<0.04	<0.01			
p,p-TDE (DDD)	<0.01 µg/l	TM231		<0.04	<0.01			
Ethion	<0.01 µg/l	TM231		<0.04	<0.01			
Endosulphan II	<0.01 µg/l	TM231		<0.04	<0.01			
p,p-DDT	<0.01 µg/l	TM231		<0.08	<0.02			
Carbophenothion	<0.01 µg/l	TM231		<0.04	<0.01			
o,p-Methoxychlor	<0.01 µg/l	TM231		<0.04	<0.01			
Triazophos	<0.01 µg/l	TM231		<0.04	<0.01			
p,p-Methoxychlor	<0.01 µg/l	TM231		<0.08	<0.02			
Endosulphan sulphate	<0.01 µg/l	TM231		<0.04	<0.01			
Permethrin I	<0.01 µg/l	TM231		<0.04	<0.01			
Phosalone	<0.01 µg/l	TM231		<0.04	<0.01			
Permethrin II	<0.01 µg/l	TM231		3.03	0.15			
Azinphos-methyl	<0.01 µg/l	TM231		<0.25	<0.01			
Azinphos-ethyl	<0.01 µg/l	TM231		<0.04	<0.01			

CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

PAH Spec MS - Aqueous (W)

Results Legend		Customer Sample R	TP03	TP05									
#	ISO17025 accredited.												
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 02/05/2012 03/05/2012 120504-110 5545000	Water(GW/SW) 02/05/2012 03/05/2012 120504-110 5545001									
S	Deviating sample.												
aq	Aqueous / settled sample.												
diss.filter	Dissolved / filtered sample.												
tot.unfilt	Total / unfiltered sample.												
*	Subcontracted test.												
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery												
(F)	Trigger breach confirmed												
Component	LOD/Units							Method					
Naphthalene (aq)	<0.1 µg/l							TM178	0.133	<0.1			
Acenaphthene (aq)	<0.015 µg/l							TM178	<0.015	<0.015			
Acenaphthylene (aq)	<0.011 µg/l							TM178	<0.011	<0.011			
Fluoranthene (aq)	<0.017 µg/l	TM178	0.146	0.0468									
Anthracene (aq)	<0.015 µg/l	TM178	0.0193	<0.015									
Phenanthrene (aq)	<0.022 µg/l	TM178	0.0466	<0.022									
Fluorene (aq)	<0.014 µg/l	TM178	<0.014	<0.014									
Chrysene (aq)	<0.013 µg/l	TM178	0.216	0.0296									
Pyrene (aq)	<0.015 µg/l	TM178	0.144	0.0383									
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	0.165	0.0335									
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	0.296	0.0291									
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	0.275	<0.027									
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178	0.317	0.027									
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	0.0695	<0.016									
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178	0.298	0.0316									
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	0.241	0.0224									
PAH, Total Detected USEPA 16 (aq)	<0.247 µg/l	TM178	2.37	0.258									



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Semi Volatile Organic Compounds

Results Legend		Customer Sample R	TP01	TP01	TP03	TP03	TP04	TP04
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.80	1.60	0.50	1.60	0.80	1.20
S	Deviating sample.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
aq	Aqueous / settled sample.		02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012
(F)	Trigger breach confirmed		120504-110	120504-110	120504-110	120504-110	120504-110	120504-110
			5544988	5544990	5544991	5544992	5544993	5544994
Component	LOD/Units	Method						
Phenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Pentachlorophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Nitrobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Isophorone	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Hexachloroethane	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Hexachlorobutadiene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Hexachlorobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
n-Dioctyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Dimethyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Diethyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
n-Dibutyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Dibenzofuran	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Carbazole	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Butylbenzyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Azobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
4-Nitrophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
4-Nitroaniline	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
4-Methylphenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
4-Chloroaniline	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
4-Bromophenylphenylether	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
3-Nitroaniline	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2-Nitrophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2-Nitroaniline	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2-Methylphenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2-Chlorophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2,6-Dinitrotoluene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100

SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:

Semi Volatile Organic Compounds

Results Legend		Customer Sample R	TP01	TP01	TP03	TP03	TP04	TP04
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		0.80	1.60	0.50	1.60	0.80	1.20
§	Deviating sample.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
aq	Aqueous / settled sample.		02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012
(F)	Trigger breach confirmed		120504-110	120504-110	120504-110	120504-110	120504-110	120504-110
			5544988	5544990	5544991	5544992	5544993	5544994
Component	LOD/Units	Method						
2,4-Dimethylphenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2,4-Dichlorophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
1,4-Dichlorobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
1,3-Dichlorobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
1,2-Dichlorobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2-Chloronaphthalene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
2-Methylnaphthalene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Benzo(a)anthracene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Chrysene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100
Naphthalene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	<100



CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Semi Volatile Organic Compounds

Results Legend		Customer Sample R	TP05	TP06	TP06	TP07	TP07	
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		1.00	0.60	1.80	1.20	2.80	
S	Deviating sample.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
aq	Aqueous / settled sample.		02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	
(F)	Trigger breach confirmed		120504-110	120504-110	120504-110	120504-110	120504-110	
			5544995	5544996	5544997	5544998	5544999	
Component	LOD/Units	Method						
Phenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Pentachlorophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Nitrobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Isophorone	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Hexachloroethane	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Hexachlorocyclopentadiene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Hexachlorobutadiene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Hexachlorobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
n-Dioctyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Dimethyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Diethyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
n-Dibutyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Dibenzofuran	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Carbazole	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Butylbenzyl phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
bis(2-Chloroethyl)ether	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
Azobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
4-Nitrophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
4-Nitroaniline	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
4-Methylphenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
4-Chlorophenylphenylether	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
4-Chloroaniline	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
4-Chloro-3-methylphenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
4-Bromophenylphenylether	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
3-Nitroaniline	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
2-Nitrophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
2-Nitroaniline	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
2-Methylphenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
1,2,4-Trichlorobenzene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
2-Chlorophenol	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
2,6-Dinitrotoluene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	
2,4-Dinitrotoluene	<100 µg/kg	TM157	<100	<100	<100	<100	<100	



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Semi Volatile Organic Compounds

Table with columns: Results Legend, Customer Sample R, TP05, TP06, TP06, TP07, TP07. Rows include components like 2,4-Dimethylphenol, 2,4-Dichlorophenol, etc., with LOD/Units and Method columns.



SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample R	TP03	TP05				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.							
S	Deviating sample.							
aq	Aqueous / settled sample.		Water(GW/SW)	Water(GW/SW)				
diss.fit	Dissolved / filtered sample.		02/05/2012	02/05/2012				
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		03/05/2012	03/05/2012				
(F)	Trigger breach confirmed		120504-110	120504-110				
			5545000	5545001				
Component	LOD/Units	Method						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1				
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<1				
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1				
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1				
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<1				
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1				
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1				
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1				
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1				
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<1				
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1				
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1				
Azobenzene (aq)	<1 µg/l	TM176	<1	<1				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<1				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<2				
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
Carbazole (aq)	<1 µg/l	TM176	<1	<1				
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1				
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5				



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

SVOC MS (W) - Aqueous

Table with columns: Results Legend, Customer Sample R, TP03, TP05, Component, LOD/Units, Method. Rows include Hexachlorobenzene (aq), Hexachlorobutadiene (aq), Pentachlorophenol (aq), Phenol (aq), n-Nitroso-n-dipropylamine (aq), Hexachloroethane (aq), Nitrobenzene (aq), Isophorone (aq), Hexachlorocyclopentadiene (aq), Indeno(1,2,3-cd)pyrene (aq).



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample R	TP01	TP01	TP03	TP03	TP04	TP04
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP01	TP01	TP03	TP03	TP04	TP04
M	mCERTS accredited.		0.80	1.60	0.50	1.60	0.80	1.20
S	Deviating sample.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
aq	Aqueous / settled sample.		02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012
diss.filt	Dissolved / filtered sample.		.	.	.	.	.	.
tot.unfilt	Total / unfiltered sample.		03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012
*	Subcontracted test.		120504-110	120504-110	120504-110	120504-110	120504-110	120504-110
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		5544988	5544990	5544991	5544992	5544993	5544994
(F)	Trigger breach confirmed							
Component	LOD/Units		Method					
GRO Surrogate % recovery**	%	TM089	103	90	95	109	44	86
GRO >C5-C12	<44 µg/kg	TM089	514	<44	155	<44	<44	<44
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5	<5	<5	<5	<5	<5
Benzene	<10 µg/kg	TM089	<10	<10	<10	<10	<10	<10
Toluene	<2 µg/kg	TM089	<2	<2	<2	<2	<2	<2
Ethylbenzene	<3 µg/kg	TM089	<3	<3	<3	<3	<3	<3
m,p-Xylene	<6 µg/kg	TM089	<6	<6	<6	<6	<6	<6
o-Xylene	<3 µg/kg	TM089	<3	<3	<3	<3	<3	<3
sum of detected mpo xylene by GC	<9 µg/kg	TM089	<9	<9	<9	<9	<9	<9
sum of detected BTEX by GC	<24 µg/kg	TM089	<24	<24	<24	<24	<24	<24
Aliphatics >C5-C6	<10 µg/kg	TM089	<10	<10	<10	<10	<10	<10
Aliphatics >C6-C8	<10 µg/kg	TM089	10.5	<10	23.1	<10	<10	<10
Aliphatics >C8-C10	<10 µg/kg	TM089	32.8	<10	28.1	<10	<10	<10
Aliphatics >C10-C12	<10 µg/kg	TM089	261	<10	44.6	<10	<10	<10
Aliphatics >C12-C16	<100 µg/kg	TM173	<100	<100	<100	<100	5550	2060
Aliphatics >C16-C21	<100 µg/kg	TM173	<100	<100	<100	<100	16100	3430
Aliphatics >C21-C35	<100 µg/kg	TM173	10600	<100	17700	1980	91300	10000
Aliphatics >C35-C44	<100 µg/kg	TM173	<100	<100	<100	<100	1980	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173	10600	<100	17700	1980	115000	15500
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10	<10	<10	<10	<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089	28.8	<10	21.5	<10	12	<10
Aromatics >EC10-EC12	<10 µg/kg	TM089	174	<10	29.7	<10	<10	<10
Aromatics >EC12-EC16	<100 µg/kg	TM173	3040	433	3880	1910	15200	16700
Aromatics >EC16-EC21	<100 µg/kg	TM173	<100	<100	3050	<100	6870	2820
Aromatics >EC21-EC35	<100 µg/kg	TM173	4750	6730	32100	5930	449000	30100
Aromatics >EC35-EC44	<100 µg/kg	TM173	<100	<100	11500	<100	62600	8280
Aromatics >EC40-EC44	<100 µg/kg	TM173	<100	<100	<100	<100	8110	4040
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	7790	7160	50500	7840	534000	58000
Total Aliphatics >C5-35	<100 µg/kg	TM173	10900	<100	17800	1980	113000	15500
Total Aromatics >C5-35	<100 µg/kg	TM173	8000	7160	39000	7840	471000	49700
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173	18900	7160	56900	9820	584000	65200
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173	18900	7160	68400	9820	649000	73500



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample R	TP05	TP06	TP06	TP07	TP07	
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP05	TP06	TP06	TP07	TP07	
M	mCERTS accredited.		1.00	0.60	1.80	1.20	2.80	
S	Deviating sample.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
aq	Aqueous / settled sample.		02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	
diss.filt	Dissolved / filtered sample.		.	.	.	.	.
tot.unfilt	Total / unfiltered sample.		03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	
*	Subcontracted test.		120504-110	120504-110	120504-110	120504-110	120504-110	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		5544995	5544996	5544997	5544998	5544999	
(F)	Trigger breach confirmed							
Component	LOD/Units		Method					
GRO Surrogate % recovery**	%	TM089	46	57	81	72	99	
GRO >C5-C12	<44 µg/kg	TM089	<44	<44	<44	<44	<44	
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5	<5	<5	<5	<5	
Benzene	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Toluene	<2 µg/kg	TM089	<2	<2	4.2	<2	3.75	
Ethylbenzene	<3 µg/kg	TM089	<3	<3	<3	<3	<3	
m,p-Xylene	<6 µg/kg	TM089	<6	<6	<6	<6	7.5	
o-Xylene	<3 µg/kg	TM089	<3	<3	<3	<3	<3	
sum of detected mpo xylene by GC	<9 µg/kg	TM089	<9	<9	<9	<9	<9	
sum of detected BTEX by GC	<24 µg/kg	TM089	<24	<24	<24	<24	<24	
Aliphatics >C5-C6	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aliphatics >C6-C8	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aliphatics >C8-C10	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aliphatics >C10-C12	<10 µg/kg	TM089	12.6	<10	<10	<10	<10	
Aliphatics >C12-C16	<100 µg/kg	TM173	7000	<100	2750	2460	<100	
Aliphatics >C16-C21	<100 µg/kg	TM173	11600	4250	4150	5320	<100	
Aliphatics >C21-C35	<100 µg/kg	TM173	39400	26500	13000	31600	<100	
Aliphatics >C35-C44	<100 µg/kg	TM173	5870	<100	1060	<100	<100	
Total Aliphatics >C12-C44	<100 µg/kg	TM173	63900	30800	20900	39400	<100	
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10	<10	11.2	<10	13.8	
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aromatics >EC12-EC16	<100 µg/kg	TM173	1950	20600	1580	<100	21200	
Aromatics >EC16-EC21	<100 µg/kg	TM173	6540	1840	1810	2410	468	
Aromatics >EC21-EC35	<100 µg/kg	TM173	259000	51500	12400	282000	7850	
Aromatics >EC35-EC44	<100 µg/kg	TM173	25500	14100	1630	6950	<100	
Aromatics >EC40-EC44	<100 µg/kg	TM173	5770	<100	<100	<100	<100	
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	293000	88100	17400	291000	29500	
Total Aliphatics >C5-35	<100 µg/kg	TM173	58000	30800	19900	39400	<100	
Total Aromatics >C5-35	<100 µg/kg	TM173	267000	74000	15800	285000	29500	
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173	325000	105000	35700	324000	29500	
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173	357000	119000	38400	331000	29500	



CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

TPH CWG (W)

Table with columns for Component, LOD/Units, Method, TP03, and TP05. Rows include GRO Surrogate %, GRO >C5-C12, Methyl tertiary butyl ether (MTBE), Benzene, Toluene, Ethylbenzene, m,p-Xylene, o-Xylene, Sum of detected Xylenes, Sum of detected BTEX, Aliphatics >C5-C6, Aliphatics >C6-C8, Aliphatics >C8-C10, Aliphatics >C10-C12, Aliphatics >C12-C16 (aq), Aliphatics >C16-C21 (aq), Aliphatics >C21-C35 (aq), Total Aliphatics >C12-C35 (aq), Aromatics >EC5-EC7, Aromatics >EC7-EC8, Aromatics >EC8-EC10, Aromatics >EC10-EC12, Aromatics >EC12-EC16 (aq), Aromatics >EC16-EC21 (aq), Aromatics >EC21-EC35 (aq), Total Aromatics >EC12-EC35 (aq), and Total Aliphatics & Aromatics >C5-35 (aq).



CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

VOC MS (S)

Results Legend		Customer Sample R	TP01	TP01	TP03	TP03	TP04	TP04
#	ISO17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.80	1.60	0.50	1.60	0.80	1.20
S	Deviating sample.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
aq	Aqueous / settled sample.		02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012
(F)	Trigger breach confirmed		120504-110	120504-110	120504-110	120504-110	120504-110	120504-110
			5544988	5544990	5544991	5544992	5544993	5544994
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	98.1	100	104	103	106	105
Toluene-d8**	%	TM116	97.3	98.7	99.3	100	99.6	99.1
4-Bromofluorobenzene**	%	TM116	118	110	102	102	103	106
Dichlorodifluoromethane	<4 µg/kg	TM116	<4	<4	<4	<4	<4	<4
Chloromethane	<7 µg/kg	TM116	<7	<7	<7	<7	<7	<7
Vinyl Chloride	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10
Bromomethane	<13 µg/kg	TM116	<13	<13	<13	<13	<13	<13
Chloroethane	<14 µg/kg	TM116	<14	<14	<14	<14	<14	<14
Trichlorofluoromethane	<6 µg/kg	TM116	<6	<6	<6	<6	<6	<6
1.1-Dichloroethene	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10
Carbon Disulphide	<7 µg/kg	TM116	<7	<7	<7	<7	<7	<7
Dichloromethane	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116	<11	<11	<11	<11	<11	<11
trans-1-2-Dichloroethene	<11 µg/kg	TM116	<11	<11	<11	<11	<11	<11
1.1-Dichloroethane	<8 µg/kg	TM116	<8	<8	<8	<8	<8	<8
cis-1-2-Dichloroethene	<5 µg/kg	TM116	<5	<5	<5	<5	<5	<5
2.2-Dichloropropane	<12 µg/kg	TM116	<12	<12	<12	<12	<12	<12
Bromochloromethane	<14 µg/kg	TM116	<14	<14	<14	<14	<14	<14
Chloroform	<8 µg/kg	TM116	<8	<8	<8	<8	<8	<8
1.1.1-Trichloroethane	<7 µg/kg	TM116	<7	<7	<7	<7	<7	<7
1.1-Dichloropropene	<11 µg/kg	TM116	<11	<11	<11	<11	<11	<11
Carbontetrachloride	<14 µg/kg	TM116	<14	<14	<14	<14	<14	<14
1.2-Dichloroethane	<5 µg/kg	TM116	<5	<5	<5	<5	<5	<5
Benzene	<9 µg/kg	TM116	<9	<9	<9	<9	<9	<9
Trichloroethene	<9 µg/kg	TM116	<9	<9	<9	<9	<9	<9
1.2-Dichloropropane	<12 µg/kg	TM116	<12	<12	<12	<12	<12	<12
Dibromomethane	<9 µg/kg	TM116	<9	<9	<9	<9	<9	<9
Bromodichloromethane	<7 µg/kg	TM116	<7	<7	<7	<7	<7	<7
cis-1-3-Dichloropropene	<14 µg/kg	TM116	<14	<14	<14	<14	<14	<14
Toluene	<5 µg/kg	TM116	<5	<5	<5	<5	<5	<5
trans-1-3-Dichloropropene	<14 µg/kg	TM116	<14	<14	<14	<14	<14	<14
1.1.2-Trichloroethane	<10 µg/kg	TM116	<10	<10	<10	<10	<10	<10
1.3-Dichloropropane	<7 µg/kg	TM116	<7	<7	<7	<7	<7	<7
Tetrachloroethene	<5 µg/kg	TM116	<5	<5	<5	<5	<5	<5
Dibromochloromethane	<13 µg/kg	TM116	<13	<13	<13	<13	<13	<13



SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:

VOC MS (S)

Results Legend		Customer Sample R	TP01	TP01	TP03	TP03	TP04	TP04	
#	ISO17025 accredited.								
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.80	1.60	0.50	1.60	0.80	1.20	
S	Deviating sample.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
aq	Aqueous / settled sample.		02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	
diss.filt	Dissolved / filtered sample.		03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	
tot.unfilt	Total / unfiltered sample.		120504-110	120504-110	120504-110	120504-110	120504-110	120504-110	
**	Subcontracted test.		5544988	5544990	5544991	5544992	5544993	5544994	
	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
Component	LOD/Units		Method						
1,2-Dibromoethane	<12 µg/kg		TM116	<12 M	<12 M	<12 M	<12 M	<12 M	<12 M
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M	<5 M	<5 M	
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M	<10 M	
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M	<4 M	<4 M	<4 M	<4 M	
p/m-Xylene	<14 µg/kg	TM116	<14 #	<14 #	<14 #	<14 #	<14 #	<14 #	
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M	<10 M	
Styrene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M	<10 M	
Bromoform	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M	<10 M	
Isopropylbenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M	<5 M	<5 M	
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #	<10 #	<10 #	
1,2,3-Trichloropropane	<17 µg/kg	TM116	<17 M	<17 M	<17 M	<17 M	<17 M	<17 M	
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M	<10 M	
Propylbenzene	<11 µg/kg	TM116	<11 M	<11 M	<11 M	<11 M	<11 M	<11 M	
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M	<9 M	<9 M	<9 M	<9 M	
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 #	<8 #	<8 #	<8 #	<8 #	<8 #	
4-Chlorotoluene	<12 µg/kg	TM116	<12 M	<12 M	<12 M	<12 M	<12 M	<12 M	
tert-Butylbenzene	<12 µg/kg	TM116	<12 #	<12 #	<12 #	<12 #	<12 #	<12 #	
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #	<9 #	<9 #	<9 #	<9 #	
sec-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M	<10 M	
4-Isopropyltoluene	<11 µg/kg	TM116	<11 M	<11 M	<11 M	<11 M	<11 M	<11 M	
1,3-Dichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M	<6 M	<6 M	<6 M	<6 M	
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M	<5 M	<5 M	
n-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M	<10 M	
1,2-Dichlorobenzene	<12 µg/kg	TM116	<12 M	<12 M	<12 M	<12 M	<12 M	<12 M	
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M	<14 M	<14 M	<14 M	<14 M	
Tert-amyl methyl ether	<15 µg/kg	TM116	<15	<15	<15	<15	<15	<15	
1,2,4-Trichlorobenzene	<6 µg/kg	TM116	<6 #	<6 #	<6 #	<6 #	<6 #	<6 #	
Hexachlorobutadiene	<12 µg/kg	TM116	<12	<12	<12	<12	<12	<12	
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M	<260 M	<13 M	<260 M	<260 M	
1,2,3-Trichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M	<6 M	<6 M	<6 M	<6 M	



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

VOC MS (S)

Results Legend		Customer Sample R	TP05	TP06	TP06	TP07	TP07	
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.		1.00	0.60	1.80	1.20	2.80	
S	Deviating sample.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	
aq	Aqueous / settled sample.		02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012	
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted test.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012	
(F)	Trigger breach confirmed		120504-110	120504-110	120504-110	120504-110	120504-110	
			5544995	5544996	5544997	5544998	5544999	
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	102	101	93.9	104	104	
Toluene-d8**	%	TM116	98.9	99.8	97.3	100	100	
4-Bromofluorobenzene**	%	TM116	103	100	125	98.5	102	
Dichlorodifluoromethane	<4 µg/kg	TM116	<4	<4	<4	<4	<4	
Chloromethane	<7 µg/kg	TM116	<7	<7	<7	<7	<7	
Vinyl Chloride	<10 µg/kg	TM116	<10	<10	<10	<10	<10	
Bromomethane	<13 µg/kg	TM116	<13	<13	<13	<13	<13	
Chloroethane	<14 µg/kg	TM116	<14	<14	<14	<14	<14	
Trichlorofluoromethane	<6 µg/kg	TM116	<6	<6	<6	<6	<6	
1.1-Dichloroethene	<10 µg/kg	TM116	<10	<10	<10	<10	<10	
Carbon Disulphide	<7 µg/kg	TM116	<7	<7	14.8	<7	<7	
Dichloromethane	<10 µg/kg	TM116	<10	<10	<10	<10	<10	
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116	<11	<11	<11	<11	<11	
trans-1-2-Dichloroethene	<11 µg/kg	TM116	<11	<11	<11	<11	<11	
1.1-Dichloroethane	<8 µg/kg	TM116	<8	<8	<8	<8	<8	
cis-1-2-Dichloroethene	<5 µg/kg	TM116	<5	<5	<5	<5	<5	
2.2-Dichloropropane	<12 µg/kg	TM116	<12	<12	<12	<12	<12	
Bromochloromethane	<14 µg/kg	TM116	<14	<14	<14	<14	<14	
Chloroform	<8 µg/kg	TM116	<8	<8	<8	<8	<8	
1.1.1-Trichloroethane	<7 µg/kg	TM116	<7	<7	<7	<7	<7	
1.1-Dichloropropene	<11 µg/kg	TM116	<11	<11	<11	<11	<11	
Carbontetrachloride	<14 µg/kg	TM116	<14	<14	<14	<14	<14	
1.2-Dichloroethane	<5 µg/kg	TM116	<5	<5	<5	<5	<5	
Benzene	<9 µg/kg	TM116	<9	<9	<9	<9	<9	
Trichloroethene	<9 µg/kg	TM116	<9	<9	<9	<9	<9	
1.2-Dichloropropane	<12 µg/kg	TM116	<12	<12	<12	<12	<12	
Dibromomethane	<9 µg/kg	TM116	<9	<9	<9	<9	<9	
Bromodichloromethane	<7 µg/kg	TM116	<7	<7	<7	<7	<7	
cis-1-3-Dichloropropene	<14 µg/kg	TM116	<14	<14	<14	<14	<14	
Toluene	<5 µg/kg	TM116	<5	<5	<5	<5	<5	
trans-1-3-Dichloropropene	<14 µg/kg	TM116	<14	<14	<14	<14	<14	
1.1.2-Trichloroethane	<10 µg/kg	TM116	<10	<10	<10	<10	<10	
1.3-Dichloropropane	<7 µg/kg	TM116	<7	<7	<7	<7	<7	
Tetrachloroethene	<5 µg/kg	TM116	<5	<5	<5	<5	<5	
Dibromochloromethane	<13 µg/kg	TM116	<13	<13	<13	<13	<13	



SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:

VOC MS (S)

Results Legend		Customer Sample R	TP05	TP06	TP06	TP07	TP07		
#	ISO17025 accredited.								
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.00	0.60	1.80	1.20	2.80		
S	Deviating sample.		Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
aq	Aqueous / settled sample.		02/05/2012	02/05/2012	02/05/2012	02/05/2012	02/05/2012		
diss.filt	Dissolved / filtered sample.		03/05/2012	03/05/2012	03/05/2012	03/05/2012	03/05/2012		
tot.unfilt	Total / unfiltered sample.		120504-110	120504-110	120504-110	120504-110	120504-110		
tot.unfilt	Subcontracted test.		5544995	5544996	5544997	5544998	5544999		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
Component	LOD/Units		Method						
1,2-Dibromoethane	<12 µg/kg		TM116	<12 M	<12 M	<12 M	<12 M	<12 M	
Chlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M	<5 M		
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M		
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M	<4 M	<4 M	<4 M		
p/m-Xylene	<14 µg/kg	TM116	<14 #	<14 #	<14 #	<14 #	<14 #		
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M		
Styrene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M		
Bromoform	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M		
Isopropylbenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M	<5 M		
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #	<10 #		
1,2,3-Trichloropropane	<17 µg/kg	TM116	<17 M	<17 M	<17 M	<17 M	<17 M		
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M		
Propylbenzene	<11 µg/kg	TM116	<11 M	<11 M	<11 M	<11 M	<11 M		
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M	<9 M	<9 M	<9 M		
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8 #	<8 #	<8 #	<8 #	<8 #		
4-Chlorotoluene	<12 µg/kg	TM116	<12 M	<12 M	<12 M	<12 M	<12 M		
tert-Butylbenzene	<12 µg/kg	TM116	<12 #	<12 #	<12 #	<12 #	<12 #		
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #	<9 #	<9 #	<9 #		
sec-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M		
4-Isopropyltoluene	<11 µg/kg	TM116	<11 M	<11 M	<11 M	<11 M	<11 M		
1,3-Dichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M	<6 M	<6 M	<6 M		
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M	<5 M	<5 M		
n-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M		
1,2-Dichlorobenzene	<12 µg/kg	TM116	<12 M	<12 M	<12 M	<12 M	<12 M		
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M	<14 M	<14 M	<14 M		
Tert-amyl methyl ether	<15 µg/kg	TM116	<15	<15	<15	<15	<15		
1,2,4-Trichlorobenzene	<6 µg/kg	TM116	<6 #	<6 #	<6 #	<6 #	<6 #		
Hexachlorobutadiene	<12 µg/kg	TM116	<12	<12	<12	<12	<12		
Naphthalene	<13 µg/kg	TM116	<260 M	<260 M	<13 M	<260 M	<260 M		
1,2,3-Trichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M	<6 M	<6 M	<6 M		



CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R	TP03	TP05			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference					
M	mCERTS accredited.		Water(GW/SW)	Water(GW/SW)			
S	Deviating sample.		02/05/2012	02/05/2012			
aq	Aqueous / settled sample.						
diss.fit	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted test.		03/05/2012	03/05/2012			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		120504-110	120504-110			
(F)	Trigger breach confirmed		5545000	5545001			
Component	LOD/Units		Method				
Dibromofluoromethane**	%	TM208	95.8	97.6			
Toluene-d8**	%	TM208	100	103			
4-Bromofluorobenzene**	%	TM208	85.8	98.2			
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	#	#	
Chloromethane	<1 µg/l	TM208	<1	<1	#	#	
Vinyl chloride	<1 µg/l	TM208	<1	<1	#	#	
Bromomethane	<1 µg/l	TM208	<1	<1	#	#	
Chloroethane	<1 µg/l	TM208	<1	<1	#	#	
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	#	#	
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#	
Carbon disulphide	<1 µg/l	TM208	<1	<1	#	#	
Dichloromethane	<3 µg/l	TM208	<3	<3	#	#	
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	#	#	
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#	
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#	
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#	
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#	
Bromochloromethane	<1 µg/l	TM208	<1	<1	#	#	
Chloroform	<1 µg/l	TM208	<1	<1	#	#	
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	#	#	
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#	
Carbontetrachloride	<1 µg/l	TM208	<1	<1	#	#	
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#	
Benzene	<1 µg/l	TM208	<1	<1	#	#	
Trichloroethene	<1 µg/l	TM208	<1	<1	#	#	
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#	
Dibromomethane	<1 µg/l	TM208	<1	<1	#	#	
Bromodichloromethane	<1 µg/l	TM208	<1	<1	#	#	
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#	
Toluene	<1 µg/l	TM208	<1	<1	#	#	
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#	
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	#	#	
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#	
Tetrachloroethene	<1 µg/l	TM208	<1	<1	#	#	
Dibromochloromethane	<1 µg/l	TM208	<1	<1	#	#	



CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample R	TP03	TP05									
#	ISO17025 accredited.												
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 02/05/2012	Water(GW/SW) 02/05/2012									
S	Deviating sample.												
aq	Aqueous / settled sample.												
diss.filt	Dissolved / filtered sample.												
tot.unfilt	Total / unfiltered sample.												
*	Subcontracted test.												
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery												
(F)	Trigger breach confirmed												
Component	LOD/Units							Method					
1,2-Dibromoethane	<1 µg/l							TM208	<1	<1	#	#	
Chlorobenzene	<1 µg/l	TM208	<1	<1	#	#							
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	#	#							
Ethylbenzene	<1 µg/l	TM208	<1	<1	#	#							
m,p-Xylene	<1 µg/l	TM208	<1	<1	#	#							
o-Xylene	<1 µg/l	TM208	<1	<1	#	#							
Styrene	<1 µg/l	TM208	<1	<1	#	#							
Bromoform	<1 µg/l	TM208	<1	<1	#	#							
Isopropylbenzene	<1 µg/l	TM208	<1	<1	#	#							
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1									
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	#	#							
Bromobenzene	<1 µg/l	TM208	<1	<1	#	#							
Propylbenzene	<1 µg/l	TM208	<1	<1	#	#							
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	#	#							
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1	#	#							
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	#	#							
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#							
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1	#	#							
sec-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#							
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	#	#							
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#							
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#							
n-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#							
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1									
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1									
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#							
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	#	#							
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	#	#							
Naphthalene	<1 µg/l	TM208	<1	<1	#	#							
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#							
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1									



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Asbestos Identification - Soil

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP01 0.80 SOLID 02/05/2012 00:00:00 120504-110 5544988 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP01 1.60 SOLID 02/05/2012 00:00:00 120504-110 5544990 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP03 0.50 SOLID 02/05/2012 00:00:00 120504-110 5544991 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP03 1.60 SOLID 02/05/2012 00:00:00 120504-110 5544992 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP04 0.80 SOLID 02/05/2012 00:00:00 120504-110 5544993 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP04 1.20 SOLID 02/05/2012 00:00:00 120504-110 5544994 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP05 1.00 SOLID 02/05/2012 00:00:00 120504-110 5544995 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP06 0.60 SOLID 02/05/2012 00:00:00 120504-110 5544996 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP06 1.80 SOLID 02/05/2012 00:00:00 120504-110 5544997 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP07 1.20 SOLID 02/05/2012 00:00:00 120504-110 5544998 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP07 2.80 SOLID 02/05/2012 00:00:00 120504-110 5544999 TM048	10/05/12	Tomasz Pawlikowski	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

SDG: 120504-110
 Job: D_RPSCON_BFT-73
 Client Reference:

Location: Dunkineely
 Customer: RPS Consultants Ltd
 Attention: Joseph McGrath

Order Number: 240453380
 Report Number: 181268
 Superseded Report:

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		Site Location	Dunkineely
Mass Sample taken (kg)	0.312	Moisture Content Ratio (%)	77.9
Mass of dry sample (kg)	0.175	Dry Matter Content Ratio (%)	56.2
Particle Size <4mm	>95%		

Case	
SDG	120504-110
Lab Sample Number(s)	5544991
Sampled Date	02-May-2012
Customer Sample Ref.	TP03
Depth (m)	0.50

Landfill Waste Acceptance Criteria Limits		
Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	<6 or >9	-
-	-	-
-	-	-

Solid Waste Analysis

Total Organic Carbon (%)	3.26
Loss on Ignition (%)	10.5
Sum of BTEX (mg/kg)	<0.024
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	28.2
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	6.55
ANC to pH 6 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	0.0665

Eluate Analysis	C ₂ Conc ⁿ in 2:1 eluate	C ₈ Conc ⁿ in 8:1 eluate	A ₂ 2:1 conc ⁿ leached	A ₂₋₁₀ Cumulative conc ⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.000541	0.000422	0.00108	0.00434	0.5	2	25
Barium	0.0123	0.00283	0.0246	0.0381	20	100	300
Cadmium	0.00022	0.000152	0.00044	0.00159	0.04	1	5
Chromium	0.00205	0.00187	0.00411	0.0189	0.5	10	70
Copper	0.0236	0.0127	0.0473	0.138	2	50	100
Mercury Dissolved (CVAf)	0.0000234	0.0000276	0.0000468	0.000272	0.01	0.2	2
Molybdenum	0.000636	<0.00024	0.00127	<0.0024	0.5	10	30
Nickel	0.00553	0.0045	0.0111	0.0461	0.4	10	40
Lead	0.00542	0.00708	0.0109	0.0691	0.5	10	50
Antimony	0.00101	0.000683	0.00203	0.00717	0.06	0.7	5
Selenium	0.000559	0.0006	0.00112	0.00596	0.1	0.5	7
Zinc	0.0535	0.0191	0.107	0.226	4	50	200
Chloride	12.6	<2	25.2	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	<2	<2	<4	<20	1000	20000	50000
Total Dissolved Solids	89.6	21.4	179	284	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.032	<0.16	1	-	-
Dissolved Organic Carbon	18.6	13.4	37.2	139	500	800	1000

Leach Test Information	2:1	8:1
Date Prepared	09-May-2012	09-May-2012
pH (pH Units)	7.481	7.771
Conductivity (µS/cm)	112.90	22.30
Temperature (°C)	20.90	18.80
Volume Leachant (Litres)	0.214	1.400
Volume of Eluate VE1 (Litres)	0.180	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
 Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
 Mcerts Certification does not apply to leachates
 16/05/2012 13:57:41
 13:55:53 16/05/2012



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Notification of Deviating Samples

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
5556547	TP03		LIQUID	yanide Comp/Free/Total/Thiocyanat	Cyanide, Total	Sample holding time exceeded
5556547	TP03		LIQUID	yanide Comp/Free/Total/Thiocyanat	Thiocyanate	Sample holding time exceeded
5557189	TP04	0.80	SOLID	Easily Liberated Sulphide	Sulphide, Easily liberated	Sample holding time exceeded
5557947	TP05	1.00	SOLID	Easily Liberated Sulphide	Sulphide, Easily liberated	Sample holding time exceeded
5561433	TP01	0.80	SOLID	Easily Liberated Sulphide	Sulphide, Easily liberated	Sample holding time exceeded
5561625	TP04	1.20	SOLID	Easily Liberated Sulphide	Sulphide, Easily liberated	Sample holding time exceeded
5561808	TP07	2.80	SOLID	Easily Liberated Sulphide	Sulphide, Easily liberated	Sample holding time exceeded

Note : Test results may be compromised



CERTIFICATE OF ANALYSIS

Validated

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Notification of NDPs (No determination possible)

Date Received : 04/05/2012 16:31:20

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
5544995	TP05	1.00	Anions by Kone (soil)	Sample unsuitable for extraction



CERTIFICATE OF ANALYSIS

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage Batch Test 2:1/8:1 Cumulative		
TM004	Modified: US EPA Method 8321A	Solvent extraction of soil		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 120 1981; BS EN 872	Determination of total suspended solids in waters		
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 109 1984	Determination of alkalinity in aqueous samples		
TM045	MEWAM BOD5 2nd Ed. HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM099	BS 2690: Part 7:1968 / BS 6068: Part 2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit		
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990; BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser		
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM182	CEN/TC 292 - WI 292046-characterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		



CERTIFICATE OF ANALYSIS

SDG: 120504-110 **Location:** Dunkineely **Order Number:** 240453380
Job: D_RPSCON_BFT-73 **Customer:** RPS Consultants Ltd **Report Number:** 181268
Client Reference: **Attention:** Joseph McGrath **Superseded Report:**

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
TM186	Determination of Acidic Herbicides in Groundwater and Potable Water by LC/MSD Using Selective Ion Monitoring. Agilent Technologies Inc. Application Note 5988-5882EN.	The Determination of Acid Herbicides in Environmental Water Samples and Leachates by LC/MS QQQ.		
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM212	SO/TR 11905-2: 1997. Water quality – Determination of nitrogen –Part 2:Determination of bound nitrogen, after combustion and oxidation to nitrogen dioxide, chemiluminescence detection.	Determination of Total Nitrogen by High Temperature Catalytic Oxidation followed by Chemiluminescence Detection		
TM213	In-house Method	Rapid Determination of PAHs by GC-FID		
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM231	Agilent 6890 Gas Chromatograph system using an Agilent 5973 Mass Selective Detector (MSD)	Determination of Organochlorine and Organophosphorus Pesticides and Triazine Herbicides by GCMS		
TM239	Sulphide in Waters and Effluents 1983 (Tentative Methods) HMSO 1983, ISBN 011 7517186	Determination of Easily Liberated Sulphide in Waste waters		
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser		
TM243		Mixed Anions In Soils By Kone		
TM245	By GC-FID	Determination of GRO by Headspace in waters		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		
TM294		Determination of Free Sulphur in liquids by HPLC		
TM321		Organic matter Content of Soil By Titration		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Test Completion Dates

Lab Sample No(s)	5544988	5544990	5544991	5544992	5545000	5544993	5544994	5544995	5545001	5544996
Customer Sample Ref.	TP01	TP01	TP03	TP03	TP03	TP04	TP04	TP05	TP05	TP06
AGS Ref.										
Depth	0.80	1.60	0.50	1.60		0.80	1.20	1.00		0.60
Type	SOLID	SOLID	SOLID	SOLID	LIQUID	SOLID	SOLID	SOLID	LIQUID	SOLID
Acid Herbicides (W)					10-May-2012				10-May-2012	
Alkalinity as CaCO3					10-May-2012				10-May-2012	
Ammoniacal Nitrogen					10-May-2012				10-May-2012	
ANC at pH4 and ANC at pH 6			14-May-2012							
Anions by Kone (soil)	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012			14-May-2012
Anions by Kone (w)			14-May-2012		14-May-2012				11-May-2012	
Asbestos Identification (Soil)	10-May-2012	10-May-2012	10-May-2012	10-May-2012		10-May-2012	10-May-2012	10-May-2012		10-May-2012
BOD True Total					10-May-2012				10-May-2012	
Boron Water Soluble	15-May-2012	14-May-2012	14-May-2012	14-May-2012		15-May-2012	14-May-2012	15-May-2012		14-May-2012
CEN 2:1 Leachate (2 Stage)			09-May-2012							
CEN 2:1 Readings			10-May-2012							
CEN 8:1 Leachate (2 Stage)			10-May-2012							
CEN 8:1 Readings			11-May-2012							
COD Unfiltered					06-May-2012				06-May-2012	
Conductivity (at 20 deg.C)					09-May-2012				09-May-2012	
Cyanide Comp/Free/Total/Thiocyanate	11-May-2012	14-May-2012	14-May-2012	14-May-2012	11-May-2012	14-May-2012	11-May-2012	14-May-2012	10-May-2012	14-May-2012
Dissolved Metals by ICP-MS			14-May-2012		11-May-2012				11-May-2012	
Dissolved Organic/Inorganic Carbon			14-May-2012							
Easily Liberated Sulphide	11-May-2012	11-May-2012	11-May-2012	11-May-2012	11-May-2012	14-May-2012	11-May-2012	14-May-2012	11-May-2012	11-May-2012
EPH CWG (Aliphatic) Aqueous GC (W)					14-May-2012				14-May-2012	
EPH CWG (Aliphatic) GC (S)	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	14-May-2012		14-May-2012
EPH CWG (Aromatic) Aqueous GC (W)					14-May-2012				14-May-2012	
EPH CWG (Aromatic) GC (S)	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	14-May-2012		14-May-2012
Fluoride			14-May-2012		11-May-2012				11-May-2012	
Free Sulphur					11-May-2012				11-May-2012	
GRO by GC-FID (S)	13-May-2012	11-May-2012	13-May-2012	11-May-2012		13-May-2012	13-May-2012	13-May-2012		13-May-2012
GRO by GC-FID (W)					10-May-2012				10-May-2012	
Hexavalent Chromium (s)	14-May-2012	11-May-2012	11-May-2012	11-May-2012		14-May-2012	14-May-2012	14-May-2012		11-May-2012
Hexavalent Chromium (w)					10-May-2012				10-May-2012	
Kjeldahl Nitrogen on liquids					14-May-2012				14-May-2012	
Loss on Ignition in soils			14-May-2012							
Mercury Dissolved			14-May-2012		14-May-2012				14-May-2012	
Metals by iCap-OES (Soil)	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	14-May-2012		14-May-2012
Metals by iCap-OES Dissolved (W)					10-May-2012				10-May-2012	
Mineral Oil	14-May-2012	14-May-2012	14-May-2012	14-May-2012		15-May-2012	15-May-2012	15-May-2012		15-May-2012
Nitrite by Kone (w)					14-May-2012				10-May-2012	
OC, OP Pesticides and Triazine Herb					14-May-2012				14-May-2012	
PAH Spec MS - Aqueous (W)					14-May-2012				14-May-2012	
PAH Value of soil	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	14-May-2012		14-May-2012
PCB Congeners - Aqueous (W)					14-May-2012				14-May-2012	
PCBs by GCMS	12-May-2012		12-May-2012	12-May-2012		14-May-2012	12-May-2012	14-May-2012		12-May-2012
pH	11-May-2012	11-May-2012	11-May-2012	11-May-2012		11-May-2012	11-May-2012	11-May-2012		11-May-2012
pH Value					10-May-2012				10-May-2012	
Phenols by HPLC (S)	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	14-May-2012		14-May-2012
Phenols by HPLC (W)			14-May-2012		14-May-2012				14-May-2012	
Sample description	10-May-2012	10-May-2012	10-May-2012	10-May-2012		10-May-2012	10-May-2012	09-May-2012		10-May-2012
Semi Volatile Organic Compounds	13-May-2012	13-May-2012	13-May-2012	13-May-2012		13-May-2012	13-May-2012	13-May-2012		13-May-2012
Solvent Extract	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	14-May-2012		14-May-2012
Suspended Solids					11-May-2012				11-May-2012	
SVOC MS (W) - Aqueous					11-May-2012				11-May-2012	
Total Dissolved Solids			14-May-2012							
Total Nitrogen					14-May-2012				14-May-2012	
Total Organic and Inorganic Carbon					10-May-2012				10-May-2012	
Total Organic Carbon	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	15-May-2012		14-May-2012
Total Sulphate	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	14-May-2012		14-May-2012
Total Sulphur	11-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	14-May-2012		14-May-2012
TPH CWG (W)					14-May-2012				14-May-2012	
TPH CWG GC (S)	14-May-2012	14-May-2012	14-May-2012	14-May-2012		14-May-2012	14-May-2012	14-May-2012		14-May-2012
VOC MS (S)	14-May-2012	14-May-2012	15-May-2012	14-May-2012		15-May-2012	15-May-2012	15-May-2012		15-May-2012
VOC MS (W)					10-May-2012				10-May-2012	



SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Lab Sample No(s)	5544997	5544998	5544999
	TP06	TP07	TP07
Customer Sample Ref.			
AGS Ref.			
Depth	1.80	1.20	2.80
Type	SOLID	SOLID	SOLID
Anions by Kone (soil)	14-May-2012	14-May-2012	14-May-2012
Asbestos Identification (Soil)	10-May-2012	10-May-2012	10-May-2012
Boron Water Soluble	14-May-2012	14-May-2012	14-May-2012
Cyanide Comp/Free/Total/Thiocyanate	14-May-2012	14-May-2012	11-May-2012
Easily Liberated Sulphide	11-May-2012	11-May-2012	11-May-2012
EPH CWG (Aliphatic) GC (S)	14-May-2012	14-May-2012	14-May-2012
EPH CWG (Aromatic) GC (S)	14-May-2012	14-May-2012	14-May-2012
GRO by GC-FID (S)	14-May-2012	11-May-2012	13-May-2012
Hexavalent Chromium (s)	11-May-2012	11-May-2012	14-May-2012
Metals by iCap-OES (Soil)	14-May-2012	14-May-2012	14-May-2012
Mineral Oil	14-May-2012	16-May-2012	15-May-2012
PAH Value of soil	14-May-2012	14-May-2012	14-May-2012
PCBs by GCMS		12-May-2012	
pH	11-May-2012	11-May-2012	14-May-2012
Phenols by HPLC (S)	14-May-2012	14-May-2012	14-May-2012
Sample description	10-May-2012	10-May-2012	10-May-2012
Semi Volatile Organic Compounds	13-May-2012	13-May-2012	13-May-2012
Solvent Extract	14-May-2012	14-May-2012	14-May-2012
Total Organic Carbon	14-May-2012	14-May-2012	14-May-2012
Total Sulphate	14-May-2012	14-May-2012	14-May-2012
Total Sulphur	14-May-2012	14-May-2012	14-May-2012
TPH CWG GC (S)	14-May-2012	14-May-2012	14-May-2012
VOC MS (S)	14-May-2012	15-May-2012	15-May-2012

SDG: 120504-110
Job: D_RPSCON_BFT-73
Client Reference:

Location: Dunkineely
Customer: RPS Consultants Ltd
Attention: Joseph McGrath

Order Number: 240453380
Report Number: 181268
Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5 -C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D&C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENTEXTRACTABLE MATTER	D&C	DOM	SOX THERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOX THERM	GRAVIMETRIC
ELEMENTAL SULPHUR	D&C	DOM	SOX THERM	HPLC
PHENOLS BY GCMS	WET	DOM	SOX THERM	GC-MS
HERBICIDES	D&C	HEXANE ACETONE	SOX THERM	GC-MS
PESTICIDES	D&C	HEXANE ACETONE	SOX THERM	GC-MS
EPH (DFO)	D&C	HEXANE ACETONE	END OVER END	GC-FID
EPH (MIN OIL)	D&C	HEXANE ACETONE	END OVER END	GC-FID
EPH (CLEANED UP)	D&C	HEXANE ACETONE	END OVER END	GC-FID
EPH CWGBY GC	D&C	HEXANE ACETONE	END OVER END	GC-FID
PCBAROCLOR 1254/PCB CON	D&C	HEXANE ACETONE	END OVER END	GC-MS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE ACETONE	MICROWAVE TM218.	GC-MS
>C6-C40	WET	HEXANE ACETONE	SHAKER	GC-FID
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE ACETONE	SHAKER	GC-FID
SEMI VOLATILE ORGANIC COMPOUNDS	WET	DOM ACETONE	SONICATE	GC-MS

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC-MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC-FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC-FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC-FID
PCB7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC-MS
PCBAROCLOR 1254	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC-MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC-MS
FREESULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PESTOCPOPP	DCM	LIQUID/LIQUID SHAKE	GC-MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC-MS
PHENOLS MS	ACETONE	SOLID PHASE EXTRACTION	GC-MS
TPH by INFRARED (IR)	TCE	STIRRED EXTRACTION (STIR-BAR)	R
MINERAL OIL BY R	TCE	STIRRED EXTRACTION (STIR-BAR)	R
GLYCOLS	NONE	DIRECT INJECTION	GC-FID

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anorthophyllite	-
Fibrous Tremolite	-

APPENDIX C
SUMMARY OF SOIL CONTAMINATION RESULTS

Method Detection Limit						<0.35	<0.02	<1	<1	<1	<1	<15	<0.02			<0.6	<0.6	<0.02	<0.9	<1.4	<0.7	<0.14	<0.2	<1.0	<1.9
Depth	Sample Identity	Sample Date	Alcontrol Sample Ref. n	Sample No.	INORGANICS	Soil Organic Matter	Total Sulphur	pH	Total Cyanide	Free Cyanide	Thiocyanate	Sulphide (easily liberated)	Total Sulphate	Asbestos Screen	METALS	Chromium VI	Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury	Nickel	Selenium	Zinc
						%	%	pH Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.80	TP01	02/05/2012	5544988	1		1.61	0.0482	6.37	1.00	1.00	1.00	15.00	0.02	No Asbestos Detected	0.60	7.17	0.70	23.40	36.30	24.00	0.14	31.80	1.00	98.60	
1.60	TP01	02/05/2012	5544990	2		1.49	0.0669	6.37	1.00	1.00	1.00	15.00	0.02	No Asbestos Detected	0.60	18.70	3.05	27.00	63.50	74.30	0.14	60.10	10.00	313.00	
0.50	TP03	02/05/2012	5544991	3		-	0.0651	6.55	1.00	1.00	3.50	15.00	0.06	No Asbestos Detected	3.00	4.23	1.43	12.20	44.90	105.00	0.14	14.30	1.10	132.00	
1.60	TP03	02/05/2012	5544992	4		1.04	0.0456	6.66	1.00	1.00	1.00	15.00	0.02	No Asbestos Detected	1.20	4.11	0.53	15.40	14.10	25.00	0.14	21.30	1.00	163.00	
0.80	TP04	02/05/2012	5544993	5		48.3	0.686	5.92	1.00	1.00	8.73	15.00	0.20	No Asbestos Detected	0.60	4.44	1.05	9.05	19.50	18.00	0.14	16.20	4.30	57.60	
1.20	TP04	02/05/2012	5544994	6		3.09	0.0986	5.97	1.00	1.00	1.00	15.00	0.04	No Asbestos Detected	0.60	5.02	0.42	19.30	17.60	23.10	0.14	25.80	1.00	172.00	
1.00	TP05	02/05/2012	5544995	7		77.6	0.781	6.64	1.00	1.00	3.55	15.00	0.19	No Asbestos Detected	1.20	0.60	0.35	1.62	9.12	1.21	0.14	9.30	2.93	6.95	
0.60	TP06	02/05/2012	5544996	8		10.7	0.154	6.19	1.00	1.00	6.44	15.00	0.16	No Asbestos Detected	1.20	4.32	0.77	19.10	28.20	23.00	0.14	15.40	2.78	97.80	
1.80	TP06	02/05/2012	5544997	9		2.12	0.131	8.04	1.00	1.00	1.00	15.00	0.03	No Asbestos Detected	0.60	6.08	0.76	19.60	134.00	21.50	0.14	24.40	1.00	268.00	
1.20	TP07	02/05/2012	5544998	10		5.24	0.188	5.92	1.00	1.00	1.14	15.00	0.04	No Asbestos Detected	3.00	2.44	0.43	6.38	6.31	4.93	0.14	6.51	1.00	41.20	
2.80	TP07	02/05/2012	5544999	11		1.66	0.146	8.2	1.00	1.00	1.00	15.00	0.04	No Asbestos Detected	0.60	6.03	0.79	21.70	31.80	18.50	0.14	37.80	1.00	159.00	
*CLEA SGV - Based SOM value of 6%																640	230				26	1800	13000		
*ATRISKSOIL GAC - Based SOM value of 1%																									
*ATRISKSOIL GAC - Based SOM value of 6%									34						330				109000	6830	530				917000
*LQM/CIEH GAC - Based SOM value of 1%																									
*LQM/CIEH GAC - Based SOM value of 2.5%																									
*LQM/CIEH GAC - Based SOM value of 6%																									
*CL:AIRE GAC - Based SOM value of 1%																									
*CL:AIRE GAC - Based SOM value of 2.5%																									
*CL:AIRE GAC - Based SOM value of 6%																									

*Soil Guideline Value (SGV) or Generic Assessment Criteria (GAC) for Commercial Enduse

No. of value	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Max	77.60	0.78	8.20	1.00	1.00	8.73	15.00								3.00	18.70	3.05	27.00	134.00	105.00	0.14	60.10	10.00	313.00

Method Detection Limit				<1.0	<10	<0.01	<0.01	<0.015	<0.01	<0.015	<0.06		<0.010	<0.010	<0.010	<0.010	<0.100	<0.100	<0.100	<0.100	<0.010	<0.010	<0.010		
Depth	Sample Identity	Sample Date	Alconrol Sample Ref. n°	Sample No.	Boron (water soluble) mg/kg	POLYCYCLIC AROMATIC HYDROCARBONS	Total 17 EPA PAHs mg/kg	PHENOLS	Phenol mg/kg	Creosols mg/kg	Xylenols mg/kg	2,3,5-Trimethylphenol mg/kg	2-isopropylphenol mg/kg	Total Phenols mg/kg	HYDROCARBONS TPH-CWG	Aliphatics EC-C8-C8 mg/kg	Aliphatics EC-C8-C8 mg/kg	Aliphatics EC-C8-C10 mg/kg	Aliphatics EC-C10-C12 mg/kg	Aliphatics EC-C12-C16 mg/kg	Aliphatics EC-C16-C21 mg/kg	Aliphatics EC-C21-C35 mg/kg	Aromatics EC-C6-C7 mg/kg	Aromatics EC-C7-C8 mg/kg	Aromatics EC-C9-C10 mg/kg
0.80	TP01	02/05/2012	5544988	1	1.00	>10	>10	0.01	0.01	0.015	0.01	0.015	0.06	0.01	0.0105	0.0328	0.261	0.1	0.1	10.6	0.1	0.01	0.01	0.0288	
1.60	TP01	02/05/2012	5544990	2	1.00	>10	>10	0.01	0.01	0.015	0.01	0.015	0.06	0.01	0.01	0.01	0.01	0.1	0.1	0.1	0.1	0.01	0.01	0.01	
0.50	TP03	02/05/2012	5544991	3	1.00	>10	>10	0.01	0.01	0.015	0.01	0.015	0.06	0.01	0.0231	0.0281	0.0446	0.1	0.1	17.7	0.1	0.01	0.01	0.0215	
1.60	TP03	02/05/2012	5544992	4	1.00	>10	>10	0.01	0.01	0.015	0.01	0.015	0.06	0.01	0.01	0.01	0.01	0.1	0.1	1.98	0.1	0.01	0.01	0.01	
0.80	TP04	02/05/2012	5544993	5	2.43	>10	>10	0.04	0.01	0.015	0.01	0.015	0.06	0.01	0.01	0.01	0.01	5.55	16.1	91.3	1.98	0.01	0.01	0.012	
1.20	TP04	02/05/2012	5544994	6	1.00	>10	>10	0.01	0.01	0.015	0.01	0.015	0.06	0.01	0.01	0.01	0.01	2.06	3.43	10	0.1	0.01	0.01	0.01	
1.00	TP05	02/05/2012	5544995	7	3.95	>10	>10	0.063	0.01	0.015	0.01	0.015	0.06	0.01	0.01	0.01	0.0126	7	11.6	39.4	5.87	0.01	0.01	0.01	
0.60	TP06	02/05/2012	5544996	8	1.00	<10	<10	0.01	0.01	0.015	0.01	0.015	0.06	0.01	0.01	0.01	0.01	0.1	4.25	26.5	0.1	0.01	0.01	0.01	
1.80	TP06	02/05/2012	5544997	9	1.00	>10	>10	0.01	0.01	0.015	0.01	0.015	0.06	0.01	0.01	0.01	0.01	2.75	4.15	13	1.06	0.01	0.01	0.0112	
1.20	TP07	02/05/2012	5544998	10	1.00	>10	>10	0.0141	0.01	0.015	0.01	0.015	0.06	0.01	0.01	0.01	0.01	2.46	5.32	31.6	0.1	0.01	0.01	0.01	
2.80	TP07	02/05/2012	5544999	11	1.00	>10	>10	0.01	0.01	0.015	0.01	0.015	0.06	0.01	0.01	0.01	0.01	0.1	0.1	0.1	0.1	0.01	0.01	0.0138	
*CLEA SGV - Based SOM value of 6%													3200												
*ATRISKSOIL GAC - Based SOM value of 1%															1000000	1000000	72600	94100	95300	1000000	1000000		13.1	414000	240
*ATRISKSOIL GAC - Based SOM value of 6%															1000000	1000000	86700	94600	95300	1000000	1000000		95	422000	2700
*LQM/CIEH GAC - Based SOM value of 1%															3400	8300	2100	10000	61000	1600000	1600000		28000	59000	3700
*LQM/CIEH GAC - Based SOM value of 2.5%															6200	18000	5100	24000	83000	1800000	1800000		49000	110000	8600
*LQM/CIEH GAC - Based SOM value of 6%															13000	42000	12000	49000	91000	1800000	1800000		90000	190000	18000
*CL:AIRE GAC - Based SOM value of 1%																									
*CL:AIRE GAC - Based SOM value of 2.5%																									
*CL:AIRE GAC - Based SOM value of 6%																									

*Soil Guideline Value (SGV) or Generic Assessment Criteria (GAC) f

No. of value

0

11

11

11

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11

11

11

11

11

11

11

11

Max

0.00

0.01

0.02

0.03

0.26

7.00

16.10

91.30

5.87

0.01

0.01

0.03

Method Detection Limit					<0.010	<0.100	<0.100	<0.100	<0.100	<0.010	<0.002	<0.003	<0.006	<0.003	<0.009	<0.024	<0.005		<3ug/kg	<3ug/kg	<3ug/kg	<3ug/kg	<3ug/kg	<3ug/kg	<3ug/kg			
Depth	Sample Identity	Sample Date	Alcontrol Sample Ref. n	Sample No.	Aromatics EC>C10-C12	Aromatics EC>C12-C16	Aromatics EC>C16-C21	Aromatics EC>C21-C35	Aromatics EC>C35-C44	TPH (Aliphatic and Aromatic C5-C14)	Benzene	Toluene	Ethyl benzene	m/p-Xylene	o-Xylene	m,p-o-Xylene	Total BTEX	MTBE	PCBS	PCB Congener 81	PCB Congener 77	PCB Congener 123	PCB Congener 114	PCB Congener 105	PCB Congener 126	PCB Congener 167		
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	
0.80	TP01	02/05/2012	5544988	1	0.174	3.04	0.1	4.75	0.1	18.9	0.01	0.002	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
1.60	TP01	02/05/2012	5544990	2	0.01	0.433	0.1	6.73	0.1	7.16	0.01	0.002	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
0.50	TP03	02/05/2012	5544991	3	0.0297	3.88	3.05	32.1	11.5	68.4	0.01	0.002	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
1.60	TP03	02/05/2012	5544992	4	0.01	1.91	0.1	5.93	0.1	9.82	0.01	0.002	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
0.80	TP04	02/05/2012	5544993	5	0.01	15.2	6.87	449	62.6	649	0.01	0.002	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
1.20	TP04	02/05/2012	5544994	6	0.01	16.7	2.82	30.1	8.28	73.5	0.01	0.002	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
1.00	TP05	02/05/2012	5544995	7	0.01	1.95	6.54	259	25.5	357	0.01	0.002	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
0.60	TP06	02/05/2012	5544996	8	0.01	20.6	1.84	51.5	14.1	119	0.01	0.002	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
1.80	TP06	02/05/2012	5544997	9	0.01	1.58	1.81	12.4	1.63	38.4	0.01	0.0042	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
1.20	TP07	02/05/2012	5544998	10	0.01	0.1	2.41	282	6.95	331	0.01	0.002	0.003	0.006	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
2.80	TP07	02/05/2012	5544999	11	0.01	21.2	0.468	7.85	0.1	29.5	0.01	0.00375	0.003	0.0075	0.003	0.009	0.024	0.005	<3	<3	<3	<3	<3	<3	<3	<3		
*CLEA SGV - Based SOM value of 6%											95	4400	2800	3200	2600													
*ATRISKSOIL GAC - Based SOM value of 1%					35300	38000	28400	28400																				
*ATRISKSOIL GAC - Based SOM value of 6%					36800	38000	28400	28400																				
*LQM/CIEH GAC - Based SOM value of 1%					17000	36000	28000	28000																				
*LQM/CIEH GAC - Based SOM value of 2.5%					29000	37000	28000	28000																				
*LQM/CIEH GAC - Based SOM value of 6%					34500	37800	28000	28000																				
*CL:AIRE GAC - Based SOM value of 1%																		7900										
*CL:AIRE GAC - Based SOM value of 2.5%																		13000										
*CL:AIRE GAC - Based SOM value of 6%																		24000										

*Soil Guideline Value (SGV) or Generic Assessment Criteria (GAC) f

No. of value	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	0	0	0	0	0	0	0	0
Max	0.17	21.20	6.87	449.00	62.60	649.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Method Detection Limit			Alcontrol Sample Ref. n°	Sample No.	<3ug/kg	<3ug/kg	<3ug/kg	<3ug/kg	<36ug/kg	SEMI VOLATILE ORGANIC COMPOUNDS	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	
Depth	Sample Identity	Sample Date			PCB Congener 156	PCB Congener 157	PCB Congener 169	PCB Congener 189	PCB Congener Total		Phenol	Pentachlorophenol	N-nitrosodi-n-propylamine	Nitrobenzene	Isophorone	Hexachloroethane	Hexachlorocyclopentadiene	Hexachlorobutadiene	Hexachlorobenzene	n-Dioctyl phthalate	Dimethyl phthalate	Diethyl phthalate	Di-n-butyl phthalate	Dibenzofuran	Carbazole	Bis(2-ethylhexyl) phthalate
			µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	
0.80	TP01	02/05/2012	5544988	1	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
1.60	TP01	02/05/2012	5544990	2	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
0.50	TP03	02/05/2012	5544991	3	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
1.60	TP03	02/05/2012	5544992	4	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
0.80	TP04	02/05/2012	5544993	5	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
1.20	TP04	02/05/2012	5544994	6	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
1.00	TP05	02/05/2012	5544995	7	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
0.60	TP06	02/05/2012	5544996	8	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
1.80	TP06	02/05/2012	5544997	9	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
1.20	TP07	02/05/2012	5544998	10	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
2.80	TP07	02/05/2012	5544999	11	<3	<3	<3	<3	<36	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
*CLEA SGV - Based SOM value of 6%									240	3200000															
*ATRISKSOIL GAC - Based SOM value of 1%																									
*ATRISKSOIL GAC - Based SOM value of 6%																									
*LQM/CIEH GAC - Based SOM value of 1%											1200000				32000	48000									
*LQM/CIEH GAC - Based SOM value of 2.5%											1300000				69000	53000									
*LQM/CIEH GAC - Based SOM value of 6%											1400000				120000	55000									
*CL:AIRE GAC - Based SOM value of 1%																	89000000		1.5E+08	15000000				9.4E+08	
*CL:AIRE GAC - Based SOM value of 2.5%																	89000000		2.2E+08	15000000				9.4E+08	
*CL:AIRE GAC - Based SOM value of 6%																	89000000		2.9E+08	15000000				9.5E+08	

*Soil Guideline Value (SGV) or Generic Assessment Criteria (GAC) f

No. of value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Method Detection Limit				<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg						
Depth	Sample Identity	Sample Date	Alcontrol Sample Ref. n	Sample No.	Bis(2-ethylhexyl) phthalate	Bis(2-chloroethoxy)methane ^e	Bis(2-chloroethyl)ether	Azobenzene	4-Nitrophenol	4-Nitroaniline	4-Methylphenol	4-Chlorophenylphenyl ether	4-Chloroaniline	4-Chloro-3-methylphenol	Bromo phenylphenyl ether	3-Nitroaniline	2-Nitrophenol	2-Nitroaniline	2-Methylphenol	1,2,4-Trichlorobenzene	2-Chlorophenol	2,5-Dinitrotoluene	2,4-Dinitrotoluene	2,4-Dimethylphenol	2,4-Dichlorophenol	2,4,6-Trichlorophenol			
					µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg
0.80	TP01	02/05/2012	5544988	1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
1.60	TP01	02/05/2012	5544990	2	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
0.50	TP03	02/05/2012	5544991	3	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
1.60	TP03	02/05/2012	5544992	4	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
0.80	TP04	02/05/2012	5544993	5	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
1.20	TP04	02/05/2012	5544994	6	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
1.00	TP05	02/05/2012	5544995	7	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
0.60	TP06	02/05/2012	5544996	8	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
1.80	TP06	02/05/2012	5544997	9	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
1.20	TP07	02/05/2012	5544998	10	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
2.80	TP07	02/05/2012	5544999	11	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100			
*CLEA SGV - Based SOM value of 6%																													
*ATRISKSOIL GAC - Based SOM value of 1%																													
*ATRISKSOIL GAC - Based SOM value of 6%																													
*LQM/CIEH GAC - Based SOM value of 1%																					230000	3500000					3500000		
*LQM/CIEH GAC - Based SOM value of 2.5%																					560000	4000000					4000000		
*LQM/CIEH GAC - Based SOM value of 6%																					1300000	4200000					4200000		
CL:AIRE GAC - Based SOM value of 1%					85000000						160000000										160000000*		1900000	3700000	16000000				
CL:AIRE GAC - Based SOM value of 2.5%					86000000						180000000											180000000*		1900000	3700000	24000000			
CL:AIRE GAC - Based SOM value of 6%					86000000						180000000											180000000*		1900000	3800000	30000000			

* Refers to Total of 2-, 3- and 4-Methylphenol

*Soil Guideline Value (SGV) or Generic Assessment Criteria (GAC) f

No. of value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Depth	Sample Identity	Sample Date	Alcontrol Sample Ref. No.	Sample No.	Method Detection Limit										VOLATILE ORGANIC COMPOUNDS											
					<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<100ug/kg	<4ug/kg	<7ug/kg	<10ug/kg	<13ug/kg	<14ug/kg	<6ug/kg	<10ug/kg	<7ug/kg	<10ug/kg	<11ug/kg	<11ug/kg	<8ug/kg
					2,4,5-Trichlorophenol	1,4-Dichlorobenzene	1,3-Dichlorobenzene	1,2-Dichlorobenzene	2-Chloronaphthalene	2-Methylnaphthalene	Benzof(a)anthracene	Chrysene	Naphthalene	Dichlorodifluoromethane	Chloromethane	Vinyl Chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethane	Carbon Disulphide	Dichloromethane	Methyl Tertiary Butyl Ether	trans-1,2-Dichloroethane	1,1-Dichloroethane	
µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg					
0.80	TP01	02/05/2012	5544988	1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
1.60	TP01	02/05/2012	5544990	2	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
0.50	TP03	02/05/2012	5544991	3	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
1.60	TP03	02/05/2012	5544992	4	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
0.80	TP04	02/05/2012	5544993	5	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
1.20	TP04	02/05/2012	5544994	6	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
1.00	TP05	02/05/2012	5544995	7	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
0.60	TP06	02/05/2012	5544996	8	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
1.80	TP06	02/05/2012	5544997	9	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
1.20	TP07	02/05/2012	5544998	10	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
2.80	TP07	02/05/2012	5544999	11	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100				
*CLEA SGV - Based SOM value of 6%																										
*ATRISKSOIL GAC - Based SOM value of 1%																					11600					
*ATRISKSOIL GAC - Based SOM value of 6%																					100000					
*LQM/CIEH GAC - Based SOM value of 1%						4500000	32000	2100000													12000					
*LQM/CIEH GAC - Based SOM value of 2.5%						10000000	77000	5100000													23000					
*LQM/CIEH GAC - Based SOM value of 6%						22000000	180000	12000000													50000					
*CL:AIRE GAC - Based SOM value of 1%									390000							1000		960000		26000		270000	7900000	22000	280000	
*CL:AIRE GAC - Based SOM value of 2.5%									960000						1200		1300000		46000		360000	13000000	40000	450000		
*CL:AIRE GAC - Based SOM value of 6%									2200000						1600		2100000		92000		560000	24000000	81000	850000		

*Soil Guideline Value (SGV) or Generic Assessment Criteria (GAC) f

No. of value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Max	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.80	0.00	0.00	0.00	0.00



Method Detection Limit				<5ug/kg	<12ug/kg	<14ug/kg	<8ug/kg	<7ug/kg	11ug/kg	<14ug/kg	<5ug/kg	<9ug/kg	<9ug/kg	<12ug/kg	<8ug/kg	<7ug/kg	<14ug/kg	<5ug/kg	<14ug/kg	<10ug/kg	<7ug/kg	<5ug/kg	<13ug/kg	<12ug/kg	<5ug/kg		
Depth	Sample Identity	Sample Date	Alcontrol Sample Ref. n	Sample No.	cis-1,2-Dichloroethene	2,2-Dichloropropane	Bromochloromethane	Chloroform	1,1,1-Trichloroethane	1,1-Dichloropropane	Carbontetrachloride	1,2-Dichloroethane	Benzene	Trichloroethene	1,2-Dichloropropane	Dibromomethane	Bromodichloromethane	cis-1,3-Dichloropropane	Toluene	trans-1,3-Dichloropropane	1,1,2-Trichloroethane	1,3-Dichloropropane	Tetrachloroethene	Dibromochloromethane	1,2-Dibromoethane	Chlorobenzene	
					µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg
0.80	TP01	02/05/2012	5544988	1	>5	<12	<14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	<7	<5	<13	<12	>5	
1.60	TP01	02/05/2012	5544990	2	>5	<12	<14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	<7	<5	<13	<12	>5	
0.50	TP03	02/05/2012	5544991	3	>5	>12	>14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	>7	<5	<13	<12	>5	
1.60	TP03	02/05/2012	5544992	4	>5	>12	>14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	>7	<5	<13	<12	>5	
0.80	TP04	02/05/2012	5544993	5	>5	<12	<14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	<7	<5	<13	<12	>5	
1.20	TP04	02/05/2012	5544994	6	>5	<12	<14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	<7	<5	<13	<12	>5	
1.00	TP05	02/05/2012	5544995	7	>5	<12	<14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	<7	<5	<13	<12	>5	
0.60	TP06	02/05/2012	5544996	8	>5	<12	<14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	<7	<5	<13	<12	>5	
1.80	TP06	02/05/2012	5544997	9	>5	<12	<14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	<7	<5	<13	<12	>5	
1.20	TP07	02/05/2012	5544998	10	>5	<12	<14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	<7	<5	<13	<12	>5	
2.80	TP07	02/05/2012	5544999	11	>5	<12	<14	<8	<7	<11	<14	<5	<9	<9	<12	>9	<7	<14	<5	<14	<10	<7	<5	<13	<12	>5	
*CLEA SGV - Based SOM value of 6%													95000					4400000									
*ATRISKSIL GAC - Based SOM value of 1%									325000		1440	294		5480										75800			493000
*ATRISKSIL GAC - Based SOM value of 6%									3130000		15000	1750		55000										823000			2470000
*LQM/CIEH GAC - Based SOM value of 1%									110000		700000		710		12000									130000			59000
*LQM/CIEH GAC - Based SOM value of 2.5%									190000		1400000		1000		25000									290000			130000
*LQM/CIEH GAC - Based SOM value of 6%									370000		3100000		1800		55000									660000			310000
*CL:AIRE GAC - Based SOM value of 1%					14000		2100								3300		2100					94000					
*CL:AIRE GAC - Based SOM value of 2.5%					24000		3700								5900		3700					190000					
*CL:AIRE GAC - Based SOM value of 6%					47000		7600								12000		7600					400000					

*Soil Guideline Value (SGV) or Generic Assessment Criteria (GAC) f

No. of value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Method Detection Limit				<10ug/kg	<4ug/kg	<14ug/kg	<10ug/kg	<10ug/kg	<10ug/kg	<5ug/kg	<10ug/kg	<17ug/kg	<10ug/kg	<11ug/kg	<8ug/kg	<8ug/kg	<12ug/kg	<12ug/kg	<9ug/kg	<10ug/kg	<11ug/kg	<6ug/kg	<5ug/kg	<10ug/kg	<12ug/kg		
Depth	Sample Identity	Sample Date	Alcontrol Sample Ref. n	Sample No.	1,1,1,2-Tetrachloroethane	Ethylbenzene	p,m-Xylene	o-xylene	Styrene	Bromform	Isopropylbenzene	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane	Bromobenzene	Propylbenzene	2-Chlorotoluene	1,3,5-Trimethylbenzene	4-Chlorotoluene	tert-Butylbenzene	1,2,4-Trimethylbenzene	sec-Butylbenzene	4-Isopropyltoluene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	n-Butylbenzene	1,2-Dichlorobenzene	
					µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg
0.80	TP01	02/05/2012	5544988	1	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
1.60	TP01	02/05/2012	5544990	2	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
0.50	TP03	02/05/2012	5544991	3	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
1.60	TP03	02/05/2012	5544992	4	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
0.80	TP04	02/05/2012	5544993	5	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
1.20	TP04	02/05/2012	5544994	6	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
1.00	TP05	02/05/2012	5544995	7	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
0.60	TP06	02/05/2012	5544996	8	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
1.80	TP06	02/05/2012	5544997	9	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
1.20	TP07	02/05/2012	5544998	10	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
2.80	TP07	02/05/2012	5544999	11	<10	>4	<14	<10	<10	<10	>5	>10	<17	<10	<11	>9	>8	<12	<12	>9	<10	<11	<6	<5	<10	<12	
*CLEA SGV - Based SOM value of 6%						2800000	3200000	2600000																			
*ATRISKSOIL GAC - Based SOM value of 1%						52400						131000															
*ATRISKSOIL GAC - Based SOM value of 6%						591000						1190000															
*LQM/CIEH GAC - Based SOM value of 1%						120000						290000												32000	4500000		2100000
*LQM/CIEH GAC - Based SOM value of 2.5%						260000						580000												77000	10000000		5100000
*LQM/CIEH GAC - Based SOM value of 6%						590000						1200000												180000	22000000		12000000
*CL:AIRE GAC - Based SOM value of 1%									3300000	760000	1400000				97000	4100000					42000						
*CL:AIRE GAC - Based SOM value of 2.5%									6500000	1500000	3300000				220000	9700000					99000						
*CL:AIRE GAC - Based SOM value of 6%									11000000	3100000	7700000				520000	2100000					220000						

*Soil Guideline Value (SGV) or Generic Assessment Criteria (GAC) f

No. of value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Method Detection Limit					<14ug/kg	<15ug/kg	<6ug/kg	<12ug/kg	<13ug/kg	<6ug/kg
Depth	Sample Identity	Sample Date	Alcontrol Sample Ref. n	Sample No.	1,2-Dibromo-3-chloropropane	Tert-amyl methyl ether	1,2,4-Trichlorobenzene	Hexachlorobutadiene	Naphthalene	1,2,3-Trichlorobenzene
					µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg	µg/ kg
0.80	TP01	02/05/2012	5544988	1	<14	<15	<6	<12	<13	<6
1.60	TP01	02/05/2012	5544990	2	<14	<15	<6	<12	<13	<6
0.50	TP03	02/05/2012	5544991	3	<14	<15	<6	<12	<260	<6
1.60	TP03	02/05/2012	5544992	4	<14	<15	<6	<12	<13	<6
0.80	TP04	02/05/2012	5544993	5	<14	<15	<6	<12	<260	<6
1.20	TP04	02/05/2012	5544994	6	<14	<15	<6	<12	<260	<6
1.00	TP05	02/05/2012	5544995	7	<14	<15	<6	<12	<260	<6
0.60	TP06	02/05/2012	5544996	8	<14	<15	<6	<12	<260	<6
1.80	TP06	02/05/2012	5544997	9	<14	<15	<6	<12	<13	<6
1.20	TP07	02/05/2012	5544998	10	<14	<15	<6	<12	<260	<6
2.80	TP07	02/05/2012	5544999	11	<14	<15	<6	<12	<260	<6
*CLEA SGV - Based SOM value of 6%									8180000	
*ATRISKSOIL GAC - Based SOM value of 1%									22700000	
*ATRISKSOIL GAC - Based SOM value of 6%										
*LQM/CIEH GAC - Based SOM value of 1%						230000		200000		110000
*LQM/CIEH GAC - Based SOM value of 2.5%						560000		480000		270000
*LQM/CIEH GAC - Based SOM value of 6%						1300000		1100000		620000
*CL:AIRE GAC - Based SOM value of 1%										
*CL:AIRE GAC - Based SOM value of 2.5%										
*CL:AIRE GAC - Based SOM value of 6%										

*Soil Guideline Value (SGV) or Generic Assessment Criteria (GAC) f

No. of value	0	0	0	0	0	0
Max	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX D
SUMMARY OF GROUNDWATER CONTAMINATION RESULTS

Method Detection Limit				INORGANICS	<0.05	<0.05	<1	<0.05	<0.01	<0.05	<0.05						
Sample ID	Sample Depth	Sample Date	Lab Sample Number		Total Organic Carbon	Ammoniacial Nitrogen as N	Conductivity	Fluoride	Kjeldahl Nitrogen	Sulphate	pH	Total Organic Nitrogen	COD	Chloride	Total Nitrogen	Total Cyanide	Phosphate
					mg/l	mg/l	mS/cm	mg/l	mg/l	mg/l	pH Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
TP03	0.7	02/05/2012	5545000		11.6	<0.2	0.268	<0.5	<1	28.6	5.82	<1	1900	54.8	2.81	<0.05	<0.05
TP05	0.7	02/05/2012	5545001		4.43	<0.2	0.431	<0.5	>1	25.1	7.63	<1	468	43.5	2.25	<0.05	<0.05
EPA IGVs							<1	1.00		200	6.5-9.5			30			
2010 Groundwater Regulations						0.051				187.5				187.5			
EQS Freshwater										400							
EU Drinking Water Standard										250						0.05	

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit											<0.016	METALS	<0.03	<0.01	<0.012	<0.076	<0.12
Sample ID	Sample Depth	Sample Date	Lab Sample Number	Nitrate	BOD	Thiocyanate	Total Alkalinity	Total Oxidised Nitrogen	Total Suspended Solids	Sulphide (easily liberated)	Free Sulphur		Chromium, Hexavalent	Mercury (diss. filt)	Calcium (diss. filt)	Sodium (diss. filt)	Arsenic (diss. filt)
				mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	mg/l	mg/l	µg/l
TP03	0.7	02/05/2012	5545000	6.64	>5	0.259	90.5	2.15	29100	<0.1	<0.15	<0.03	<0.01	23.9	32.8	0.478	
TP05	0.7	02/05/2012	5545001	8.27	>5	<0.05	180	1.87	1050	<0.1	<0.06	<0.03	<0.01	79.5	25.6	0.435	
EPA IGVs				25									1.00	200.00	150.00	10.00	
2010 Groundwater Regulations				37.5									0.75		150.00	7.50	
EQS Freshwater													1.00			50.00	
EU Drinking Water Standard													1.00			10.00	

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<0.036	<2.335	<0.019	<9.4	<0.1	<0.22	<0.85	<0.02	<0.04	<0.15	<0.39	<0.41	PHENOLS	<0.002
Sample ID	Sample Depth	Sample Date	Lab Sample Number	Magnesium (diss. filt)	Potassium (diss. filt)	Iron (diss. filt)	Boron (diss. filt)	Cadmium (diss. filt)	Chromium (diss. filt)	Copper (diss. filt)	Lead (diss. filt)	Manganese (diss. filt)	Nickel (diss. filt)	Selenium (diss. filt)	Zinc (diss. filt)		Phenol
				mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l	
TP03	0.7	02/05/2012	5545000	4.34	6.32	0.551	48.2	0.276	3.16	3.6	0.939	135	2.69	0.677	50	<0.002	
TP05	0.7	02/05/2012	5545001	5.39	2.43	0.0229	27.8	<0.1	4.58	<0.85	0.133	0.47	1.01	2.11	1.21	<0.002	
EPA IGVs				50.00	5.00	0.20		5.00	30.00	30.00	10.00	50.00	20.00		100.00		
2010 Groundwater Regulations								3.75	37.50	1500.00	18.75		15.00				
EQS Freshwater							2000.00	5.00	5-250		4-250		50-200		8-500		
EU Drinking Water Standard							1000.00	5.00	50.00	2000.00	10.00		20.00	10.00			

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<0.006	<0.008	<0.003	<0.006	<0.025	TOTAL PETROLEUM HYDROCARBONS	<10	<10	<10	<10	<10	<10	<10	<10
Sample ID	Sample Depth	Sample Date	Lab Sample Number	Cresols	Xylenols	2,3,5-Trimethylphenol	2-isopropylphenol	Total Phenols		Aliphatics >C5-C6	Aliphatics >C6-C8	Aliphatics >C8-C10	Aliphatics >C10-C12	Aliphatics >C12-C16 (aq)	Aliphatics >C16-C21 (aq)	Aliphatics >C21-C35 (aq)	Aromatics >C5-C7
				mg/l	mg/l	mg/l	mg/l	mg/l		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
TP03	0.7	02/05/2012	5545000	<0.006	<0.008	<0.003	<0.006	<0.025		<10	<10	<10	<10	<10	<10	<10	<10
TP05	0.7	02/05/2012	5545001	<0.006	<0.008	<0.003	<0.006	<0.025		<10	<10	<10	<10	<10	<10	<10	<10
EPA IGVs																	
2010 Groundwater Regulations																	
EQS Freshwater								0.03									
EU Drinking Water Standard								0.0005									

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<10	<10	<10	<10	<10	<10	<10	<7	<4	>5	>8	<3	<11	<28	
Sample ID	Sample Depth	Sample Date	Lab Sample Number	Aromatics >C7-C8	Aromatics >EC8-EC10	Aromatics >EC10-EC12	Aromatics >EC12-EC16 (aq)	Aromatics >EC16-EC21 (aq)	Total Aromatics >EC21-EC35 (aq)	Total Aliphatics & Aromatics >C5-35 (aq)	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	m,p,o-Xylene	BTEX, Total	
				µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
TP03	0.7	02/05/2012	5545000	<10	<10	<10	<10	<10	<10	<10	<7	<4	>5	>8	<3	<11	<28	
TP05	0.7	02/05/2012	5545001	<10	>	>	>	>	<10	<10	<7	<4	>5	>8	<3	<11	<28	
EPA IGVs										10	1	10	10	10	10			
2010 Groundwater Regulations																		
EQS Freshwater											30	50				30		
EU Drinking Water Standard										10	1							

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<3	POLYAROMATIC HYDROCARBONS (PAHS)											
Sample ID	Sample Depth	Sample Date	Lab Sample Number	Methyl tertiary butyl ether (MTBE)	<0.1	<0.015	<0.011	<0.017	<0.015	<0.022	<0.014	<0.013	<0.015	<0.017	<0.023	<0.027
				µg/l	Naphthalene (aq)	Acenaphthene (aq)	Acenaphthylene (aq)	Fluoranthene (aq)	Anthracene (aq)	Phenanthrene (aq)	Fluorene (aq)	Chrysene (aq)	Pyrene (aq)	Benzo(a)anthracene (aq)	Benzo(b)fluoranthene (aq)	Benzo(k)fluoranthene (aq)
TP03	0.7	02/05/2012	5545000	<3	0.133	<0.015	<0.011	0.146	0.0193	0.0466	<0.014	0.216	0.144	0.165	0.296	0.275
TP05	0.7	02/05/2012	5545001	<3	<0.1	<0.015	<0.011	0.0468	<0.015	<0.022	<0.014	0.0296	0.0383	0.0335	0.0291	<0.027
EPA IGVs					1				10000						0.5	0.05
2010 Groundwater Regulations																
EQS Freshwater					10											
EU Drinking Water Standard																

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<0.009	<0.016	<0.016	<0.014	<0.247	PCBs	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Sample ID	Sample Depth	Sample Date	Lab Sample Number	Benzo(a)pyrene (aq)	Dibenzo(a,h)anthracene (aq)	Benzo(g,h,i)perylene (aq)	Indeno(1,2,3-cd)pyrene (aq)	Polyaromatic hydrocarbons, Total USEPA 16 (aq)		PCB Congener 118	PCB Congener 77	PCB Congener 81	PCB Congener 105	PCB Congener 114	PCB Congener 123	PCB Congener 126	PCB Congener 156
				µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	
TP03	0.7	02/05/2012	5545000	0.317	0.0695	0.298	0.241	2.37	<0.015	>	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	
TP05	0.7	02/05/2012	5545001	0.027	<0.016	0.0316	0.0224	0.258	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	
EPA IGVs				0.01		0.05	0.05	0.1									
2010 Groundwater Regulations																	
EQS Freshwater																	
EU Drinking Water Standard				0.01				0.1									

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<0.015	<0.015	<0.015	<0.015	SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)	<1	<1	<1	<1	<1	<1	<1	<1	
Sample ID	Sample Depth	Sample Date	Lab Sample Number	PCB Congener 157	PCB Congener 167	PCB Congener 169	PCB Congener 189		1,2,4-Trichlorobenzene (aq)	1,2-Dichlorobenzene (aq)	1,3-Dichlorobenzene (aq)	1,4-Dichlorobenzene (aq)	2,4,5-Trichlorophenol (aq)	2,4,6-Trichlorophenol (aq)	2,4-Dichlorophenol (aq)	2,4-Dimethylphenol (aq)	2,4-Dinitrotoluene (aq)
				µg/l	µg/l	µg/l	µg/l		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
TP03	0.7	02/05/2012	5545000	<0.015	<0.015	<0.015	<0.015		>	>	>	>	>	>	>	>	>
TP05	0.7	02/05/2012	5545001	<0.015	<0.015	<0.015	<0.015		>	>	>	>	>	>	>	>	>
EPA IGVs																	
2010 Groundwater Regulations																	
EQS Freshwater									0.4								
EU Drinking Water Standard																	

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<1	<1	<1	<1	>1	<1	<1	<1	<1	<1	<1	<1	<1	
Sample ID	Sample Depth	Sample Date	Lab Sample Number	2,6-Dinitrotoluene (aq)	2-Chloronaphthalene (aq)	2-Chlorophenol (aq)	2-Methylnaphthalene (aq)	2-Methylphenol (aq)	2-Nitroaniline (aq)	2-Nitrophenol (aq)	3-Nitroaniline (aq)	4-Bromopheny/phenylether (aq)	4-Chloro-3-methylphenol (aq)	4-Chloroaniline (aq)	4-Chloropheny/phenylether (aq)	4-Methylphenol (aq)	4-Nitrophenol (aq)
TP03	0.7	02/05/2012	5545000	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
TP05	0.7	02/05/2012	5545001	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1
EPA IGVs																	
2010 Groundwater Regulations																	
EQS Freshwater																	
EU Drinking Water Standard																	

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<5	<1	<1	
Sample ID	Sample Depth	Sample Date	Lab Sample Number	4-Nitroaniline (aq)	Azobenzene (aq)	bis(2-Chloroethyl)ether (aq)	Chloro(ethoxy)methane (aq)	bis(2-Ethylhexyl) phthalate (aq)	Butylbenzyl phthalate (aq)	Carbazole (aq)	Dibenzofuran (aq)	n-Dibutyl phthalate (aq)	Diethyl phthalate (aq)	Dimethyl phthalate (aq)	n-Dioctyl phthalate (aq)	Hexachlorobenzene (aq)	Hexachlorobutadiene (aq)
				µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
TP03	0.7	02/05/2012	5545000	<1	>1	>1	>1	>2	>1	>1	>1	>1	>1	>1	>5	>1	>1
TP05	0.7	02/05/2012	5545001	<1	>1	>1	>1	>2	>1	>1	>1	>1	>1	>1	>5	>1	>1
EPA IGVs																	
2010 Groundwater Regulations																	
EQS Freshwater																0.03	0.1
EU Drinking Water Standard																0.1	

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<1	<1	<1	<1	<1	<1	<1	<1	VOLATILE ORGANIC COMPOUNDS (VOCs)				
Sample ID	Sample Depth	Sample Date	Lab Sample Number	Pentachlorophenol (aq)	Phenol (aq)	n-Nitroso-n-dipropylamine (aq)	Hexachloroethane (aq)	Nitrobenzene (aq)	Isophorone (aq)	Hexachlorocyclopentadiene (aq)	Indeno(1,2,3-cd)pyrene (aq)	Dichlorodifluoromethane	Chloromethane	Vinyl chloride	Bromomethane	Chloroethane
				µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
TP03	0.7	02/05/2012	5545000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TP05	0.7	02/05/2012	5545001	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EPA IGVs																
2010 Groundwater Regulations																
EQS Freshwater					2	30										
EU Drinking Water Standard					0.1	0.5								0.5		

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<1	<1	<1	<3	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Sample ID	Sample Depth	Sample Date	Lab Sample Number	Trichlorofluoromethane	1,1-Dichloroethene	Carbon disulphide	Dichloromethane	Methyl tertiary butyl ether (MTBE)	trans-1,2-Dichloroethene	1,1-Dichloroethane	cis-1,2-Dichloroethene	2,2-Dichloropropane	Bromochloromethane	Chloroform	1,1,1-Trichloroethane	1,1-Dichloropropene	Carbontetrachloride
				µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
TP03	0.7	02/05/2012	5545000	<1	>1	>1	>3	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1
TP05	0.7	02/05/2012	5545001	<1	>1	>1	>3	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1
EPA IGVs																	
2010 Groundwater Regulations																	
EQS Freshwater														12	100		
EU Drinking Water Standard																	

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Sample ID	Sample Depth	Sample Date	Lab Sample Number	1,2-Dichloroethane	Benzene	Trichloroethene	1,2-Dichloropropane	Dibromomethane	Bromodichloromethane	cis-1,3-Dichloropropene	Toluene	trans-1,3-Dichloropropene	1,1,2-Trichloroethane	1,3-Dichloropropane	Tetrachloroethene	Dibromochloromethane	1,2-Dibromoethane
				µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
TP03	0.7	02/05/2012	5545000	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1
TP05	0.7	02/05/2012	5545001	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1
EPA IGVs																	
2010 Groundwater Regulations																	
EQS Freshwater				10	30	10					50		400		10		
EU Drinking Water Standard				3	1	10	0.1			0.1					10		

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Sample ID	Sample Depth	Sample Date	Lab Sample Number	Chlorobenzene	1,1,1,2-Tetrachloroethane	Ethylbenzene	m,p-Xylene	o-Xylene	Styrene	Bromoform	Isopropylbenzene	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane	Bromobenzene	Propylbenzene	2-Chlorotoluene	1,3,5-Trimethylbenzene
				µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
TP03	0.7	02/05/2012	5545000	<1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1
TP05	0.7	02/05/2012	5545001	<1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1
EPA IGVs																	
2010 Groundwater Regulations																	
EQS Freshwater																	
EU Drinking Water Standard																	

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Sample ID	Sample Depth	Sample Date	Lab Sample Number	4-Chlorotoluene	tert-Butylbenzene	1,2,4-Trimethylbenzene	sec-Butylbenzene	4-iso-Propyltoluene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	n-Butylbenzene	1,2-Dichlorobenzene	1,2-Dibromo-3-chloropropane	1,2,4-Trichlorobenzene	Hexachlorobutadiene	tert-Amyl methyl ether (TAME)	Naphthalene
				µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
TP03	0.7	02/05/2012	5545000	<1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1
TP05	0.7	02/05/2012	5545001	<1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1	>1
EPA IGVs																	
2010 Groundwater Regulations																	
EQS Freshwater														0.4	0.1		10
EU Drinking Water Standard																	

- Exceeds Interim Guideline Value
- Exceeds DWS Value

Method Detection Limit				<1	<1
Sample ID	Sample Depth	Sample Date	Lab Sample Number	1,2,3-Trichlorobenzene	1,3,5-Trichlorobenzene
TP03	0.7	02/05/2012	5545000	µg/l <1	µg/l <1
TP05	0.7	02/05/2012	5545001	<1	<1
EPA IGVs					
2010 Groundwater Regulations					
EQS Freshwater					
EU Drinking Water Standard					

- Exceeds Interim Guideline Value
- Exceeds DWS Value

5 ATTACHMENT E

5.1 Attachment E.1 Appropriate Assessment