

# DUNGLOE LANDFILL

## Tier 1 Environmental Risk Assessment for Dungloe Historical Landfill

IBR1266  
ERA Tier 1 Final  
10<sup>th</sup> May 2021

## REPORT

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# Contents

<b>1</b>	<b>INTRODUCTION</b> .....	<b>1</b>
1.1	Site Information Section 22 register .....	2
1.2	Other Site Information Section 22 register .....	2
<b>2</b>	<b>DESK STUDY AND WALKOVER SURVEY</b> .....	<b>5</b>
2.1	Bedrock Geology .....	5
2.2	Drift Geology .....	6
2.3	Hydrogeology .....	7
2.4	Groundwater Vulnerability .....	8
2.4.1	Subsoil Permeability .....	8
2.4.2	Groundwater Recharge .....	9
2.4.3	Groundwater Vulnerability .....	10
2.5	Soils .....	10
2.6	Corine 2018 .....	12
2.7	Designated Sites .....	13
2.7.1	Special Areas of Conservation (SAC) .....	13
2.7.2	Special Protection Area (SPA) .....	15
2.7.3	National Heritage Areas (NHA) .....	16
2.7.4	Nature Reserves/National Parks .....	17
2.8	Groundwater Wells .....	18
2.9	National Water Monitoring Stations .....	19
2.10	Walkover Checklist .....	21
2.10.1	What is the Current Landuse .....	21
2.10.2	What is the Neighbouring Landuse .....	21
2.10.3	What is the Size of the Site? .....	21
2.10.4	What is the Topography? .....	21
2.10.5	Are There Potential Receptors Residents: .....	21
2.10.6	Potential Sources of Contamination Surface waste: .....	21
2.10.7	Are There Any Outfalls to Surface Water? .....	23
2.10.8	Are There Any Signs of Impact on the Environment? .....	24
2.10.9	Are There Any Indications of Remedial Measures? .....	26
2.10.10	Describe Fences and Security Features .....	27
<b>3</b>	<b>PRELIMINARY SITE INVESTIGATION WORKS</b> .....	<b>28</b>
3.1	Surface Water Monitoring .....	28
3.1.1	Results .....	28
3.2	Trial Pitting .....	30
3.3	Soils Risk Assessment Methodology .....	31
3.3.1	Human Health Risk Assessment Framework .....	31
3.3.2	Published Generic Site Assessment Criteria .....	31
3.3.3	Ground Contamination Assessment .....	32
3.3.4	Asbestos Containing Material (ACM) .....	32
3.4	Soil Leachate Testing .....	32
3.5	Waste Acceptance Criteria (WAC) .....	33
<b>4</b>	<b>CONCEPTUAL SITE MODEL AND RISK SCREENING EXERCISE</b> .....	<b>34</b>
4.1	Collation Of Data .....	34
4.2	Risk Screening Exercise .....	34
<b>5</b>	<b>ESTIMATION OF WASTE DISPOSED AT THE SITE</b> .....	<b>40</b>
<b>6</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b> .....	<b>41</b>

## Tables

Table 1.1: Risk Screening Scores and Normalised Score .....	2
Table 2.1: Groundwater Wells .....	18
Table 2.2: National Water Monitoring Stations .....	20
Table 3.1: Surface Water Locations .....	28
Table 3.2: Surface Water Results.....	29
Table 4.1: Risk Screening Scores .....	36
Table 4.2: Normalised Score .....	38
Table 4.3: Risk Classification (as per Table 5 of the Code, EPA) .....	39
Table 5.1: Volume to Weight Conversion Factors (Schedule 2 (c), (SI No 86 of 2002).....	40

## Pictures

Picture 1 Dungloe Landfill Site 1995 .....	3
Picture 2 Stone filter constructed after pollution incident reported in June 1994 .....	3
Picture 3 Wastes noted along the northern boundary of the lake .....	22
Picture 4 Wastes noted along the northern boundary of the lake .....	22
Picture 5 Wastes noted along the eastern boundary of the lake.....	23
Picture 6 Leachate Pond/Wetland .....	23
Picture 7 Overflow pipe from the leachate storage /pumping tanks .....	24
Picture 8 Construction and demolition waste. ....	25
Picture 9 Wood and carpet waste.....	25
Picture 10 Leachate Collection Tanks.....	26
Picture 11 Puraflo System .....	26
Picture 12 Puraflo System .....	27

## Figures

Figure 1.1 Site Aerial Photograph .....	1
Figure 2.1 Bedrock Geology (taken from OSI Groundwater Data Viewer) .....	5
Figure 2.2 Drift Geology (taken from OSI Groundwater Data Viewer) .....	6
Figure 2.3 Groundwater Resources (Aquifers) (taken from OSI Groundwater Data Viewer) .....	7
Figure 2.4 Subsoil Permeability (taken from OSI Groundwater Data Viewer) .....	8
Figure 2.5 Groundwater Recharge (taken from OSI Groundwater Data Viewer).....	9
Figure 2.6 Groundwater Vulnerability (taken from OSI Groundwater Data Viewer) .....	10
Figure 2.7 Teagasc Subsoils (taken from EPA Maps) .....	11
Figure 2.8 National Soil Map (taken from EPA Maps).....	12
Figure 2.9 Corine Land Cover 2018 (taken from EPA Maps).....	13
Figure 2.10 SAC (taken from EPA Maps).....	14
Figure 2.11 SPA (taken from EPA Maps).....	15
Figure 2.12 National Heritage Areas (taken from EPA Maps).....	16
Figure 2.13 Nature Reserves (taken from EPA Maps).....	17
Figure 2.14 National Parks (taken from EPA Maps) .....	18
Figure 2.15 Groundwater Wells (taken from OSI Groundwater Data Viewer) .....	19
Figure 2.16 National Water Monitoring Stations (taken from EPA Maps) .....	20
Figure 4.1 Network Diagram (Leachate Migration through Groundwater Surface Water Pathway and Landfill Gas Migration (Lateral)).....	35

## Appendices

Appendix A Drawings
Appendix B Results
Appendix C Trial Pits Logs

# 1 INTRODUCTION

RPS Consulting Engineers has been requested by Donegal County Council (DCC) to undertake a Tier 1 assessment of an unregulated historical disposal site in the townland of Sheskinarone, Dungloe, Co Donegal (See Figure 1.1 below).



**Figure 1.1 Site Aerial Photograph <sup>1</sup>**

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 by DCC the historical disposal site falls into Lowest Risk (Class C).

Lowest Risk (Class C) are those where the maximum individual S-P-R linkage score being no more than 40%, these sites are not considered to pose a significant risk to the environment or human health. A verification report on the risk status of the site may be submitted as part of the regularisation process through an administrative system, which will be established for the purpose in the context of Section 22 of the Waste Management Acts, 1996 to 2005.

<sup>1</sup> <http://map.geohive.ie/mapviewer.html>

Table 1.1: Risk Screening Scores and Normalised Score



**Risk ranking report for Dungloe town dump - Donegal County Council (S22-02359)**

Date: 23/03/2010

Page 2 of 3

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	84.00	28.00
1b	7.00	EITHER (Type: Industrial, Area >5 Ha) OR (Type: Municipal, Area > 1 <= 5 Ha)	SPR2	28.00	9.33
			SPR3	28.00	11.67
2a	3.00	Extreme Vulnerability	SPR4	28.00	11.67
2b	1.00	Poorly Productive Bedrock Groundwater Bodies (LJ, PI, Pu)	SPR5	28.00	7.00
2c	0.00	No direct connection	SPR6	0.00	0.00
2d	2.00	Bedrock	SPR7	84.00	35.00
2e	1.00	All Namurian or Irish sea tills (Low permeability), clay, alluvium, peat	SPR8	0.00	0.00
3a	1.00	Greater than 250m but less than 1km of the waste body	SPR9	0.00	0.00
3b	1.00	Greater than 250m but less than 1km of the waste body / Undesignated site within 50m of site of the waste body	SPR10	7.00	4.67
3c	1.00	Poor aquifers (PI, Pu)	SPR11	3.50	1.40
3d	0.00	Greater than 1km (No Karst Aquifer)			
3e	3.00	Within 50m of site boundary			
3f	0.50	Greater than 250m			

**Risk Classification: C: Lowest Risk**

### 1.1 Site Information Section 22 register

The following information was determined for the purpose of compiling the Section 22 register and carrying out initial risk screening:-

- Site operated by the Local Authority between 1980 and 1999;
- Estimated waste tonnage = 25k tonnes;
- Estimated site area = 2.2 Ha;
- Waste disposal took the form of infilling;

### 1.2 Other Site Information

A Landfill Engineering Amelioration Requirements Report by completed in 1995 by KMM. The following information has been derived from this report.

- The site encroached into Lough Nacree where domestic waste was being tipped directly into the main body of the lake (Picture 1) which obstructed the lakes natural outlet channel causing the level in the lake to rise and the spillage of contaminated water to the adjacent watercourses (June 1994). Works were undertaken by DCC at this time. At that time, Donegal County Council immediately took steps to help alleviate the problem by providing a filtration barrier at the site of the seepage. The filter consisted of stone laid in an existing channel combined with a final stone dam.



**Picture 1 Dungloe Landfill Site 1995<sup>2</sup>**



**Picture 2 Stone filter constructed after pollution incident reported in June 1994**

- In October 1994, the level of the lake had again risen and to prevent a spillage over the access road towards Dungloe Lough, a new trench was dug through the landfill leading from the lake to the stone filter. The trench bypassed the stone laid in the existing channel rendering this part of the filtering system ineffective. The subsequent flow of contaminated water from the lake and leachate released from the landfill entered the watercourses downstream as a highly polluted effluent pulse. The impact of the leachate was made worse due to the cleaning of a channel cut into the bog leading from the stone bed to the water bodies below the landfill. This work was carried out by Donegal County Council on behalf of local landowners to improve drainage. However the end result meant that instead of the peatland acting as a natural filter, any escaping leachate had direct and easy access to the water bodies which was not previously the case. The sudden release of contaminated water from Lough Nacree caused a large

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<sup>2</sup> Donegal County Council Dungloe Landfill Engineering Amelioration Requirements 1995

reduction in the dissolved oxygen content within the watercourses coupled with a rise in ammonia levels. As a direct consequence, a significant fish kill resulted in Jock's Lough and the stream between Jock's Lough and the larger Lough Meela. Following the incident, the trench through the landfill was filled in to prevent the continued release of leachate. Following the closure of the trench through the landfill site there was a steady rise in the water level within Lough Nacree. Contaminated water stored within the lake was escaping from the landfill, It was recommended that proper engineering amelioration works be put in place. The report recommended a programme of site works and management procedures to compliment the installation of the Puraflo treatment facility. These works were required to progressively isolate the landfill from incident rainfall and the main body of water within Lough Nacree in order to control the future biological loading to the treatment works. The site works and management procedures to be undertaken were summarised as follows:

- a) Profile the landfill site to adequate falls and introduce daily and weekly cover procedures.
  - b) Remove the volume of floating waste and stop the present practice of dumping directly into Lough Nacree.
  - c) Excavate catch drains to reduce the volume of surface water runoff entering Lough Nacree from the surrounding catchment.
  - d) Install a control weir, cascade and reed bed system to accommodate contaminated surface water overspill from Lough Nacree.
  - e) Raise the level of the access road beside Lough Nacree to prevent contaminated water entering the Lough Dungloe system.
- Leachate collection/storage tanks and a puraflo system were installed in 1995. No details/drawing of the collection/treatment system as it was constructed are available.

## 2 DESK STUDY AND WALKOVER SURVEY

A walkover survey was undertaken on Tuesday 13<sup>th</sup> of October, 2020 by Angela McGinley of RPS. 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 provided in Appendix A the Code of Practice and information gathered from desk top study.

The landfill site is situated in a rural area in the town land of Sheskinarone near the Village of Dungloe, Co Donegal at Grid Reference: 177659E, 413126N. The land is owned by Donegal County Council. This preliminary assessment was undertaken on the area shown on Aerial Photograph included in Appendix A.

### 2.1 Bedrock Geology

The bedrock geology of the site is anticipated to be the Rosses Granite G4 variety which consists of Muscovite granite of the Silurian-Devonian age. Rosses Granite G3 variety is present in the north of the site. Bedrock outcrops are present to the northwest and southeast of the site (Figure 2.1).

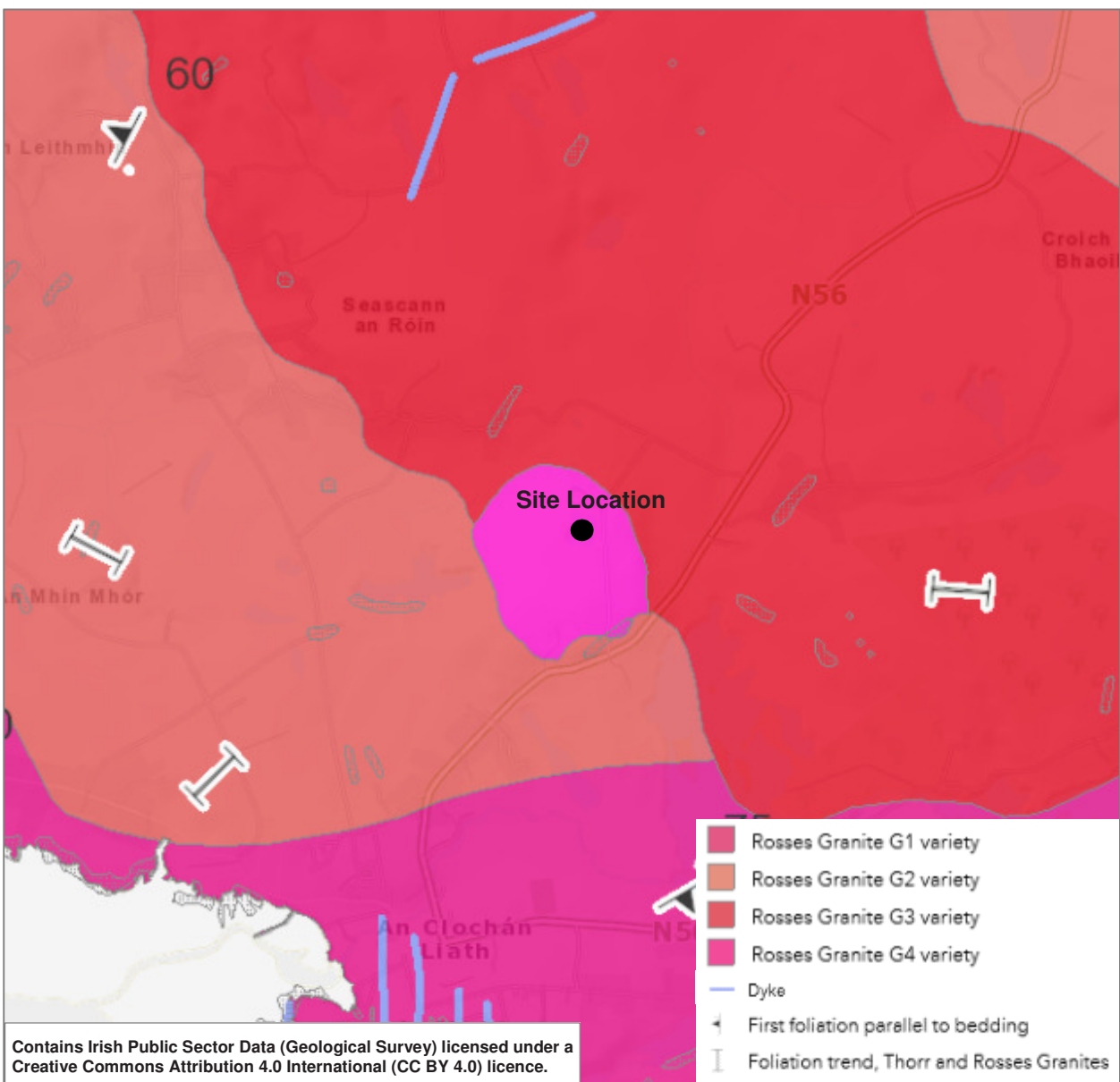


Figure 2.1 Bedrock Geology (taken from OSI Groundwater Data Viewer)

## 2.2 Drift Geology

As shown in Figure 2.2, the site is anticipated to be underlain by blanket peat. Given the infilled nature of the site, made ground would be expected to be present on the site.

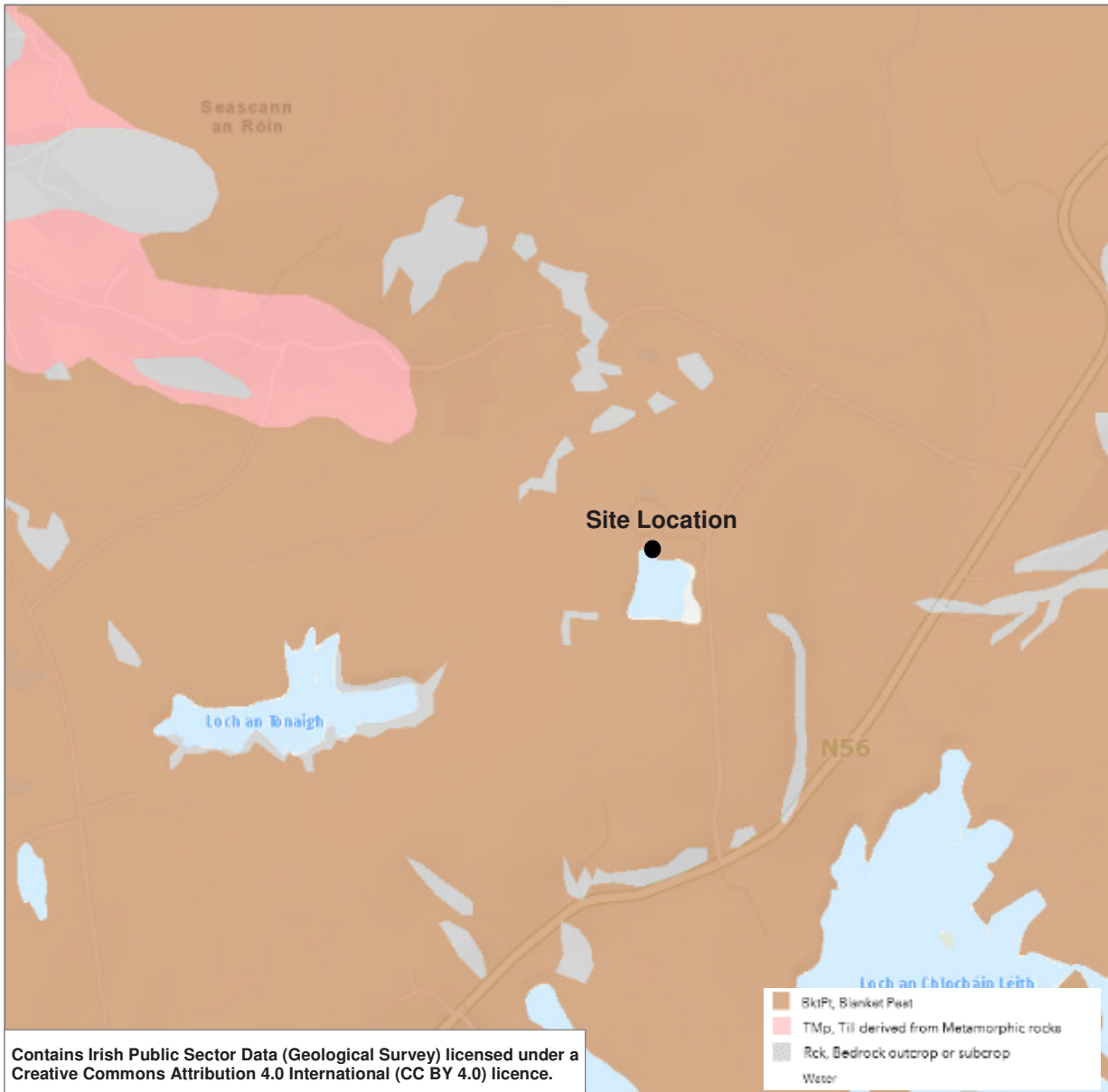


Figure 2.2 Drift Geology (taken from OSI Groundwater Data Viewer)

## 2.3 Hydrogeology

The bedrock aquifer beneath the site is classified as a Poor Aquifer with bedrock which is generally unproductive except for local yields (Figure 2.3).

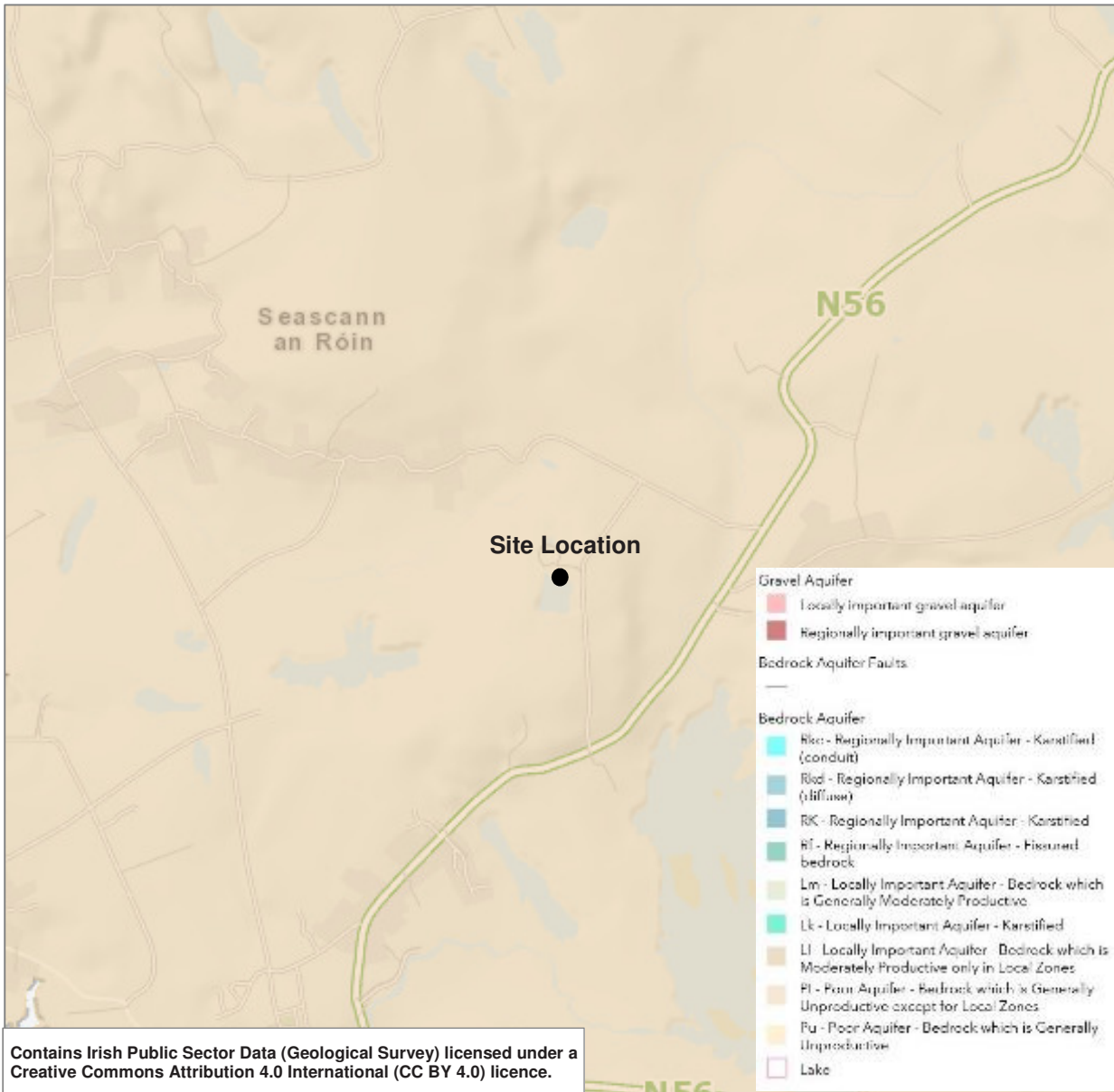


Figure 2.3 Groundwater Resources (Aquifers) (taken from OSI Groundwater Data Viewer)

## 2.4 Groundwater Vulnerability

Groundwater vulnerability describes the ease with which groundwater may be contaminated dependent on the geological and hydrogeological characteristics of the ground. It considers how groundwater and potential contaminants could move in subsurface materials (soil and subsoil) and infiltrate the groundwater. Groundwater that receives water and potential contaminants from the land surface readily and in larger quantities is considered more vulnerable than groundwater that receives water more slowly. There is also greater potential for attenuation of contaminants if the infiltration of water to groundwater is slower.

### 2.4.1 Subsoil Permeability

Geological Survey Ireland have classified the permeability of subsoils from High to Low which is determined by how easily water can infiltrate subsoils downwards at any point in the land surface. Subsoil permeability beneath the site has not been mapped as shown in Figure 2.4. Subsoil permeability to the north, east, south and west of the site is classified as low therefore it is assumed that the subsoil permeability at the site is low.

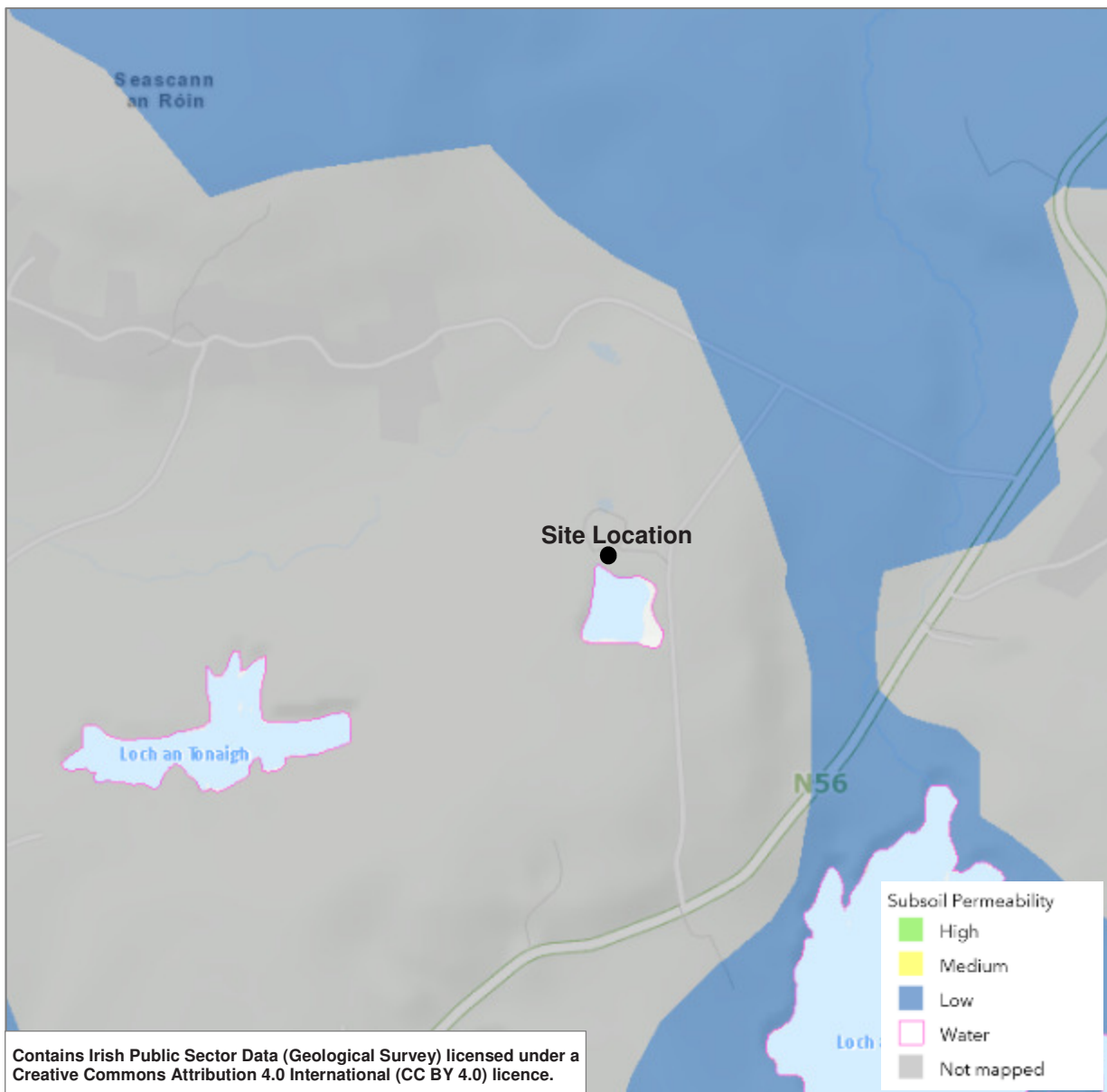


Figure 2.4 Subsoil Permeability (taken from OSI Groundwater Data Viewer)

## 2.4.2 Groundwater Recharge

Groundwater vulnerability is also linked to the recharge potential of groundwater. The Geological Survey of Ireland have estimated the average amount of rainwater that percolates through subsoils to groundwater over a year. Subsoil permeability, subsoil thickness, saturated soils and the ability of groundwater to accept percolating waters influence groundwater recharge. In areas where recharge occurs more quickly, a higher quantity of introduced contamination will have access groundwater.

The average groundwater recharge in the vicinity of the site is 51-100 mm as shown in Figure 2.5 below. The site is underlain by peat and a poor bedrock aquifer.

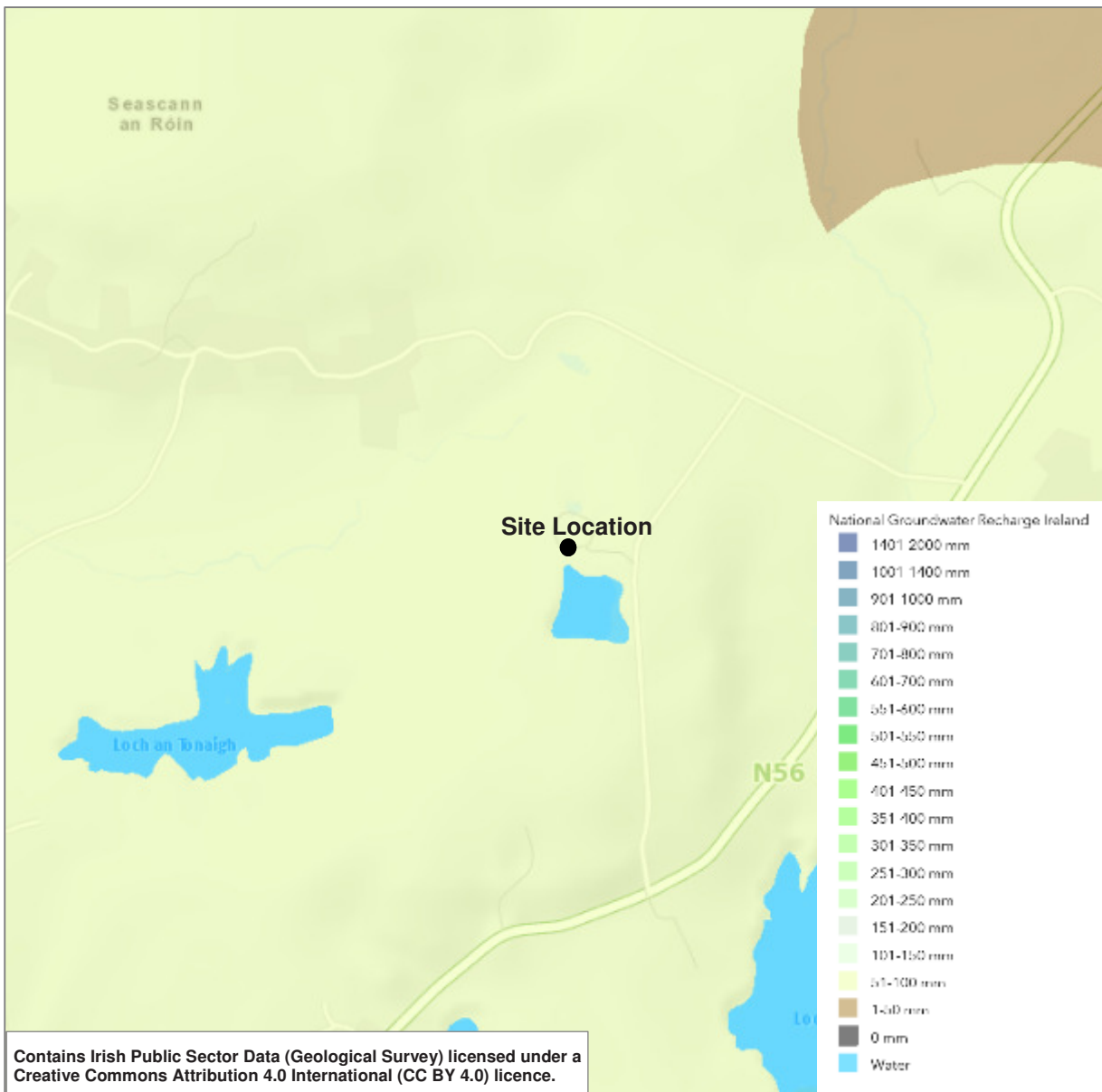


Figure 2.5 Groundwater Recharge (taken from OSI Groundwater Data Viewer)

### 2.4.3 Groundwater Vulnerability

The vulnerability of groundwater underlying the site has been classified by Geological Survey of Ireland as Extreme groundwater vulnerability indicating the groundwater can very readily and quickly receive water and potential contaminants from the subsurface. The area around Lough Nacree is classified as rock at or near the surface or karst (Figure 2.6).

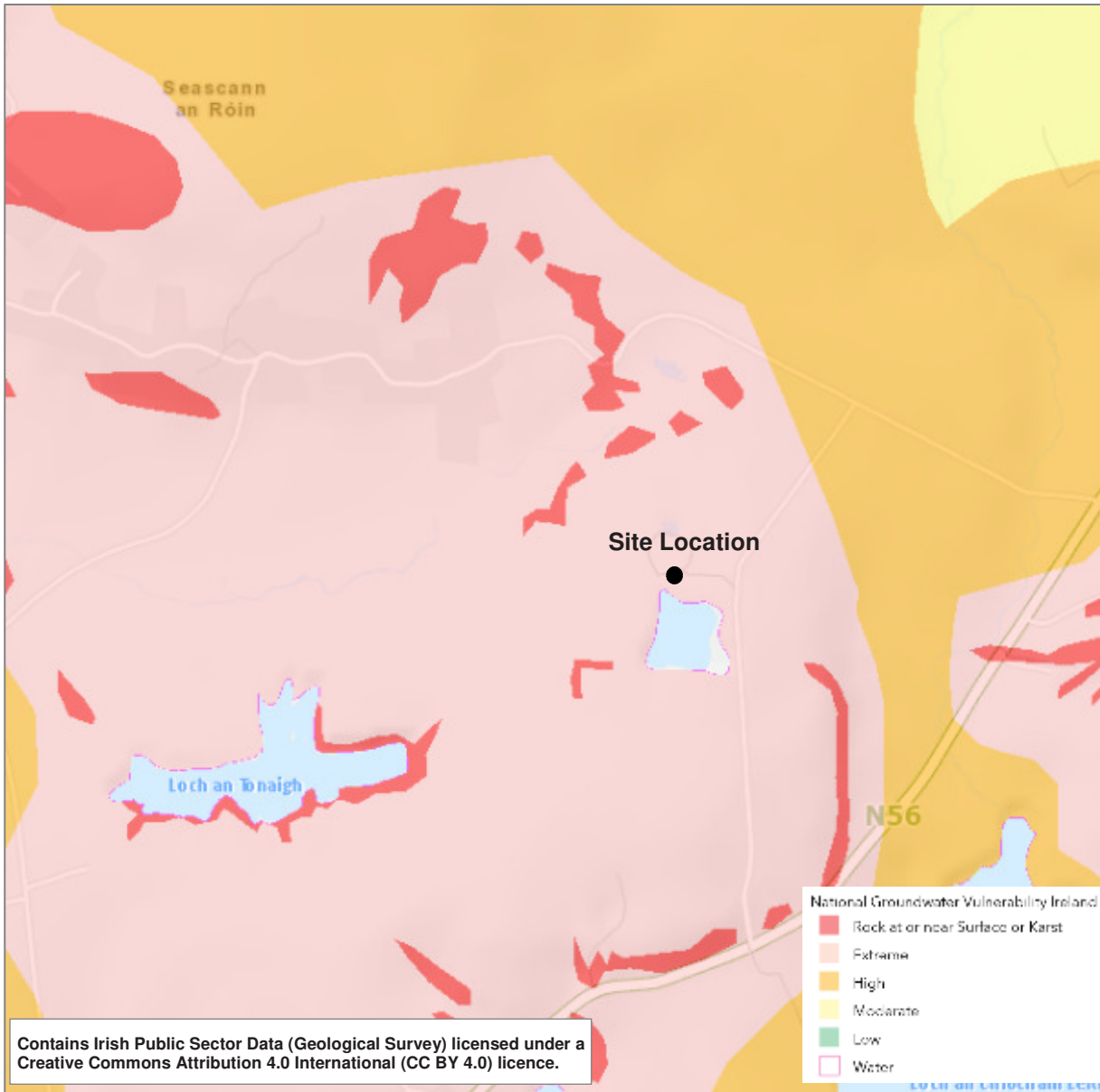
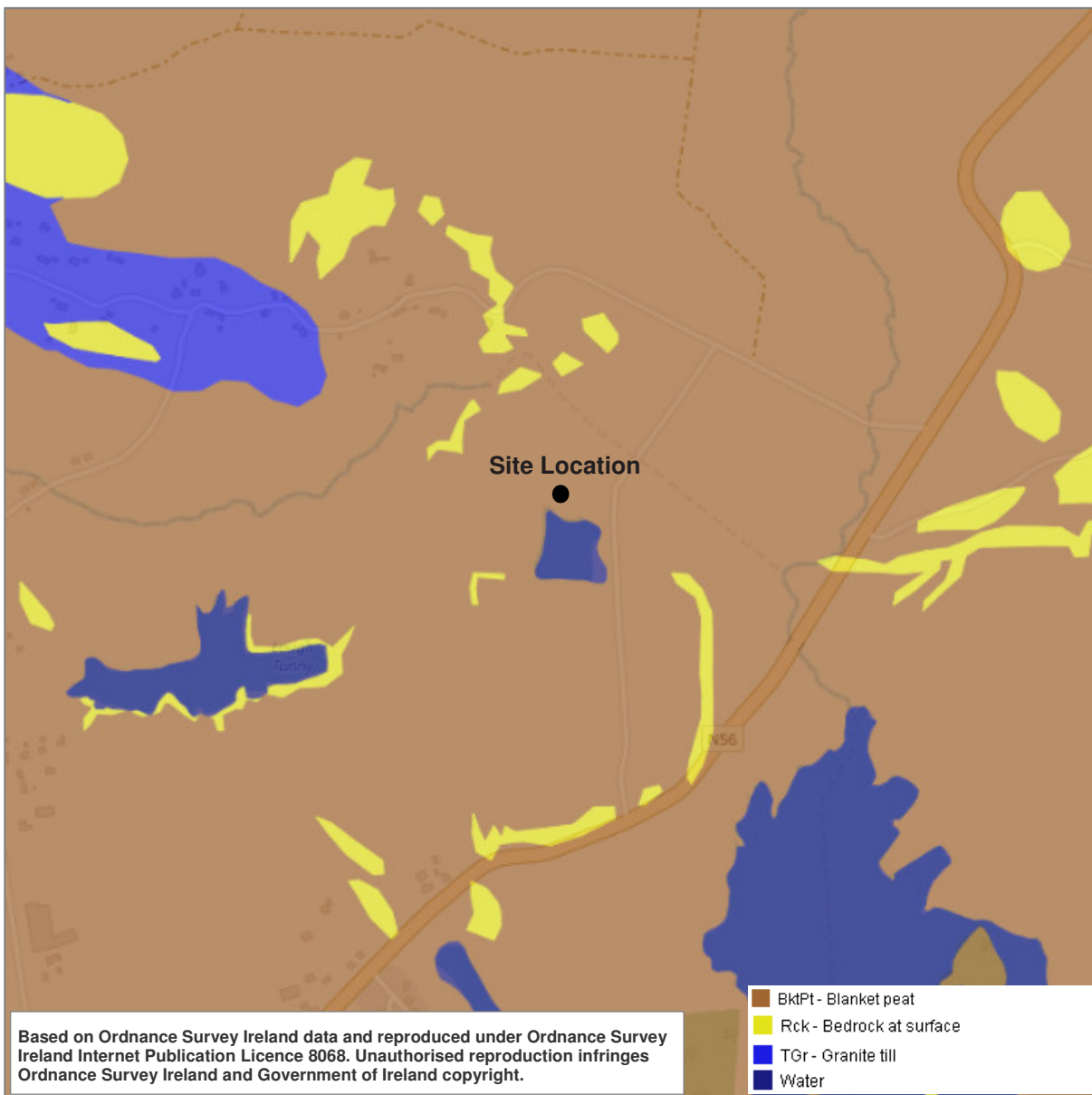


Figure 2.6 Groundwater Vulnerability (taken from OSI Groundwater Data Viewer)

### 2.5 Soils

Teagasc, EPA and GSI have produced a Teagasc Subsoil database that classifies subsoils of Ireland into 16 categories using digital stereo photogrammetry supported by field work with the aim of assisting the Water Framework Directive River Basin Management Plans. The subsoil on the site is classified as Blanket Peat (Figure 2.7).



**Figure 2.7 Teagasc Subsoils (taken from EPA Maps)**

Irish Soil Information System project used predicted mapping techniques and soil surveys to generate a national soil map for Ireland. As shown in Figure 2.8, the soil type at the site has been classified as Peat.

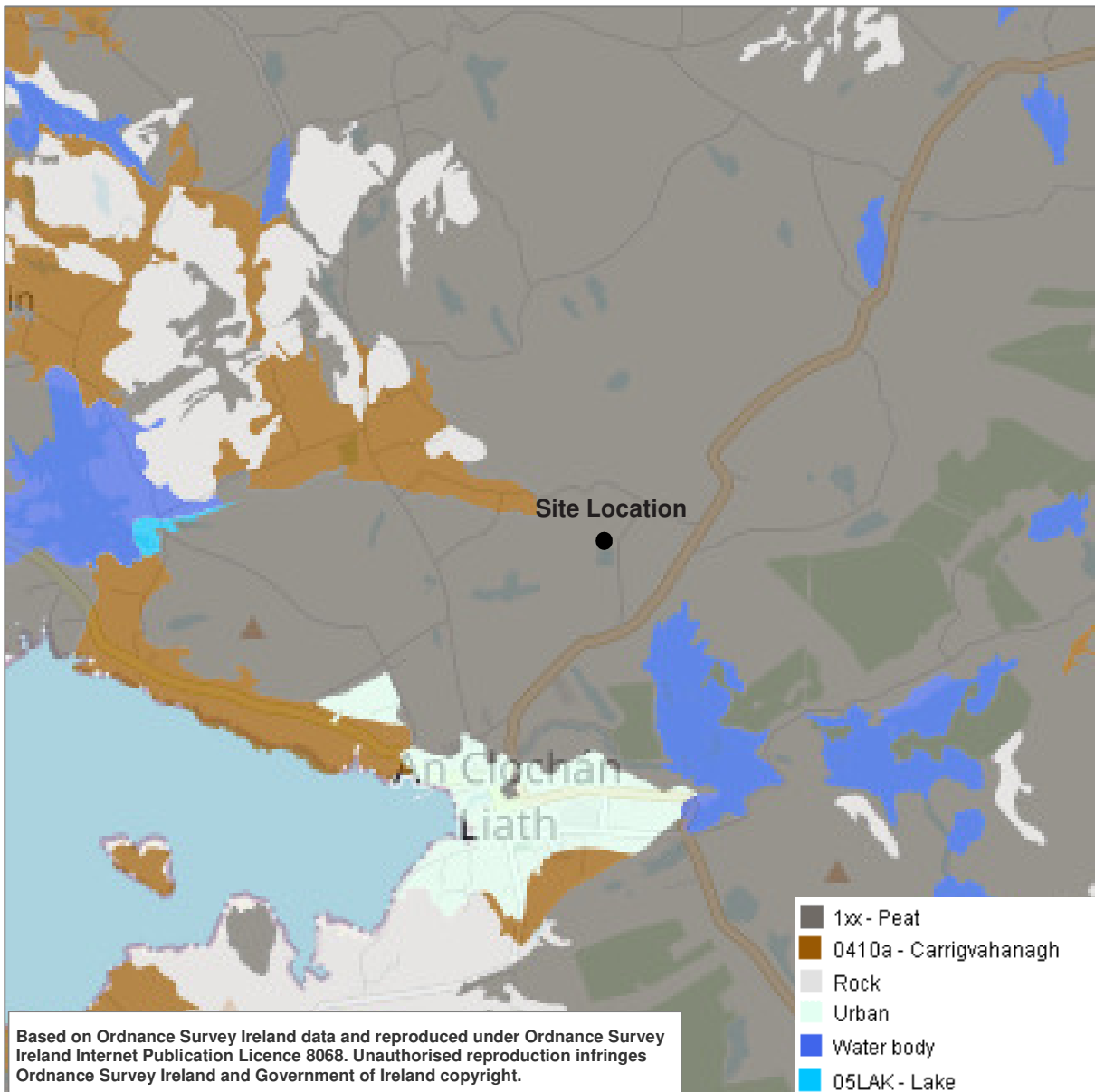


Figure 2.8 National Soil Map (taken from EPA Maps)

## 2.6 Corine 2018

Corine Land Cover 2018 is a map of the Irish environmental landscape with 44 classes of land cover from the interpretation of satellite images based on EC established CORINE specifications. As shown in Figure 2.9, the Corine Land Cover at the site is classified as Peat Bogs. An area of complex cultivation patterns is present to the northwest of the site and Dungloe town to the southwest of the site is classified as an area of discontinuous urban fabric.

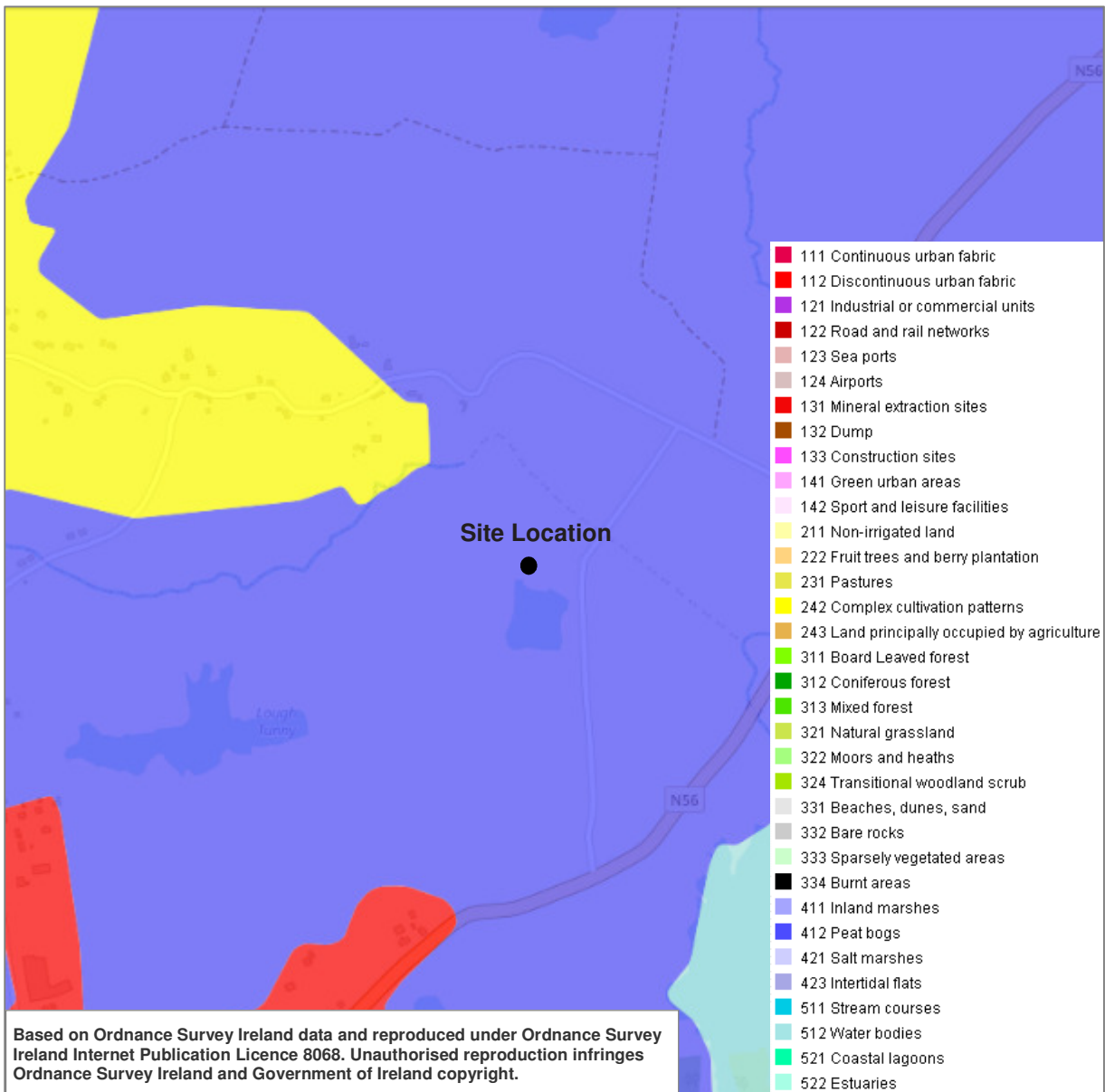


Figure 2.9 Corine Land Cover 2018 (taken from EPA Maps)

## 2.7 Designated Sites

### 2.7.1 Special Areas of Conservation (SAC)

Within 5 km of the site there are two SAC (Figure 2.10).

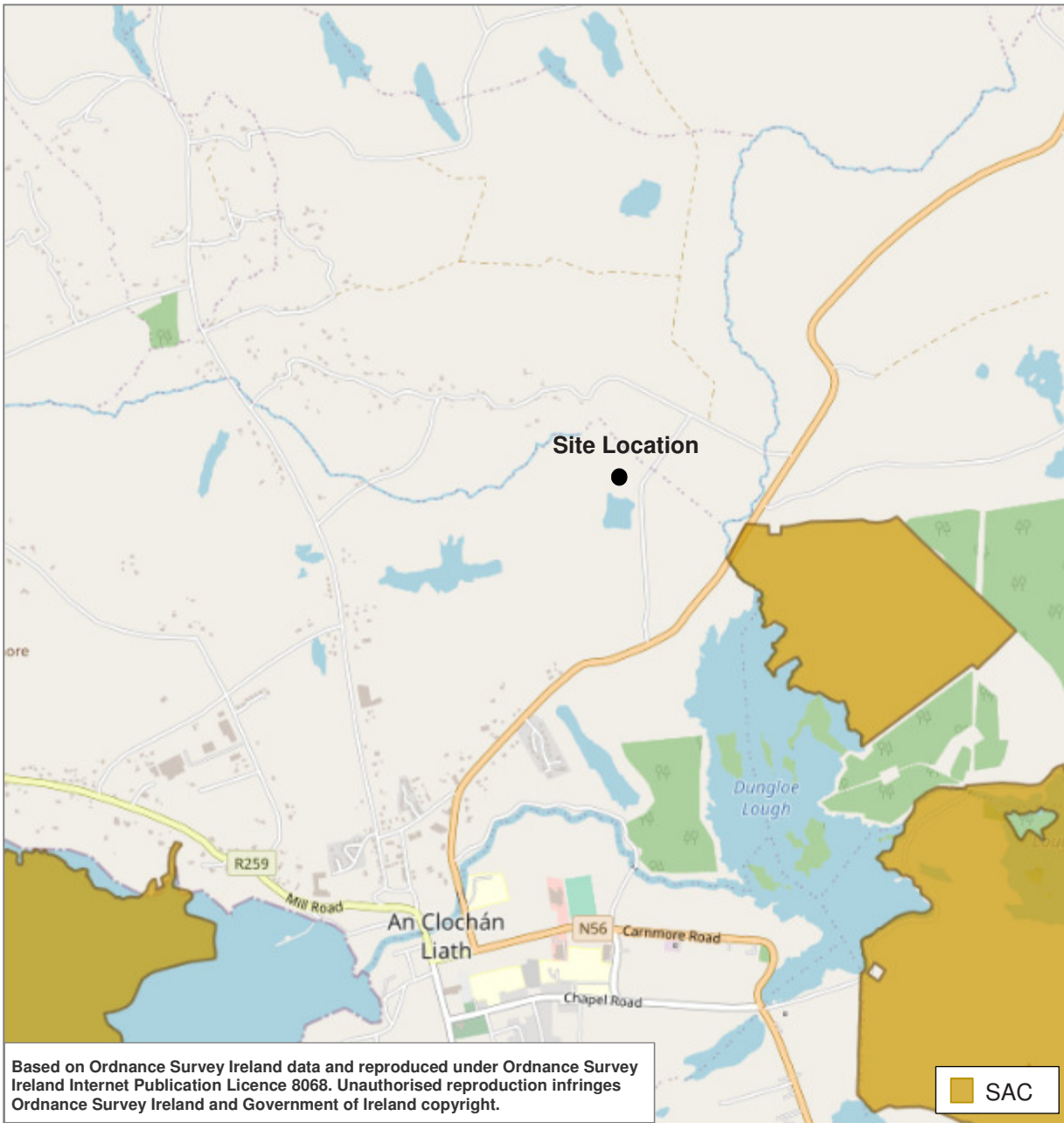
- Cloghernagore Bog and Glenveagh National Park SAC  
 Site Code: 002047  
 EU PA Type: Habitats  
 EU PA Code: IE0002047  
 Distance from site: C.420m east
- Rutland Island and Sound SAC  
 Site Code: 002283

**REPORT**

EU PA Type: Habitats

EU PA Code: IE0002283

Distance from site: c.2km southwest



**Figure 2.10 SAC (taken from EPA Maps)**

## 2.7.2 Special Protection Area (SPA)

Within 2 km of the site there is one SAC. (Figure 2.11).

- Derryveagh and Glendowan Mountains SPA  
Site Code: 004039  
EU PA Type: Birds  
EU PA Code: IE0004039  
Distance from site: c.1.5km southeast

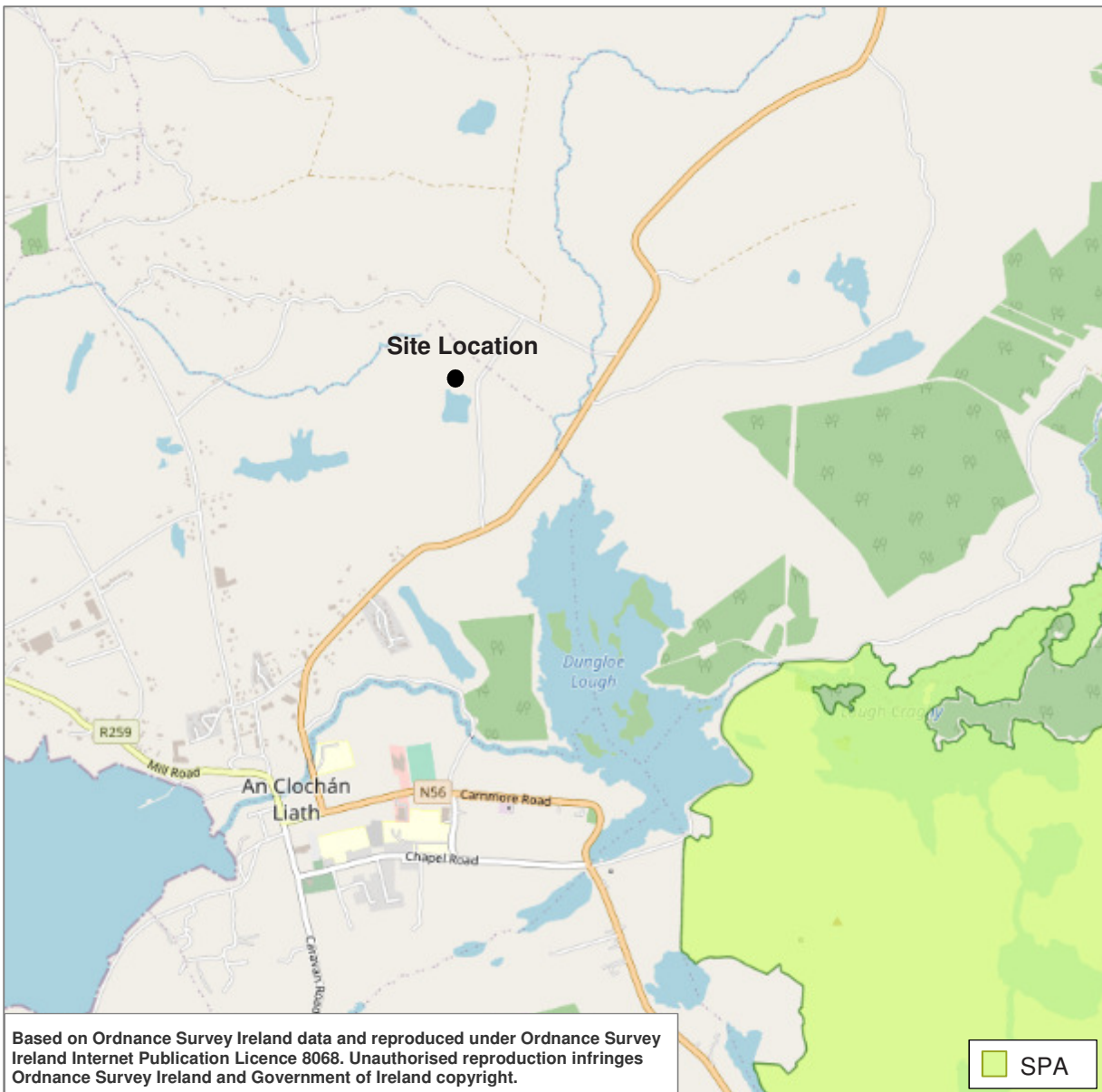


Figure 2.11 SPA (taken from EPA Maps)

### 2.7.3 National Heritage Areas (NHA)

The following NHA was identified in the vicinity of the site (Figure 2.12).

- Cloghernagore Bog and Glenveagh National Park  
Site Code: 002047  
Status: Proposed National Heritage Area  
Distance from site: C.420m east



Figure 2.12 National Heritage Areas (taken from EPA Maps)

### 2.7.4 Nature Reserves/National Parks

No nature reserves or national parks were identified in the vicinity of the site (Figure 2.13 and 2.14).



Figure 2.13 Nature Reserves (taken from EPA Maps)

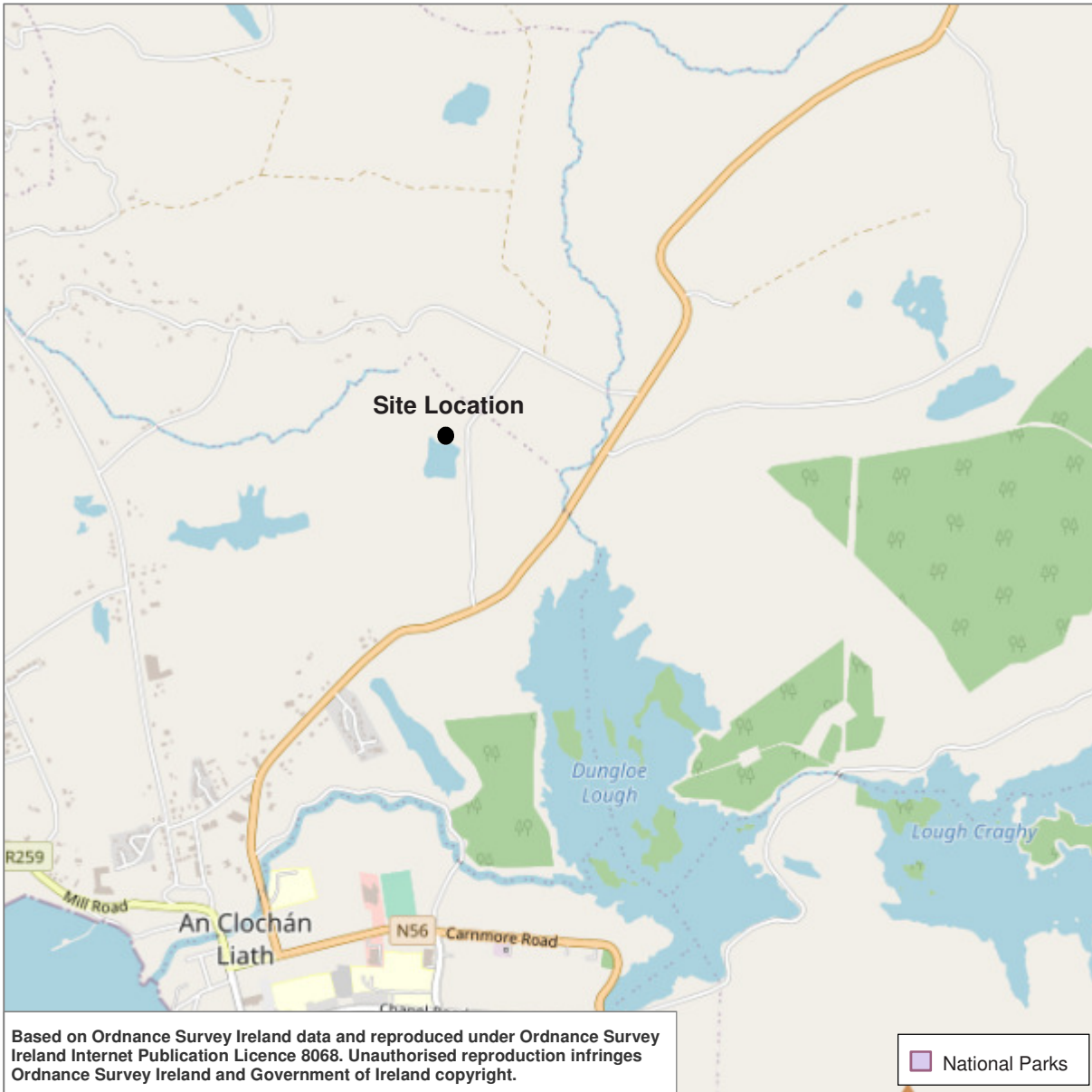


Figure 2.14 National Parks (taken from EPA Maps)

## 2.8 Groundwater Wells

Four groundwater wells were identified c.4km southwest of the site as outlined in Table 2.1.below and shown on Figure 2.15.

Table 2.1: Groundwater Wells

GSI Name	Location	Coordinates	Well Type	Depth (metres)	Yield Class	Drill Date	Driller
1739NWW001	Toberkeen	174710E, 409890N	Borehole	58	Poor	04/06/82	Des Meehan
1739NWW002	Toberkeen	174660E, 409860N	Borehole	91.5	Failure	04/06/82	Des Meehan
1739NWW003	Toberkeen	174670E, 409890N	Borehole	27.5	Poor	01/01/82	Des Meehan
1739NWW004	Toberkeen	174620E, 409880N	Borehole	91.5	Failure, Dry	04/06/82	Des Meehan

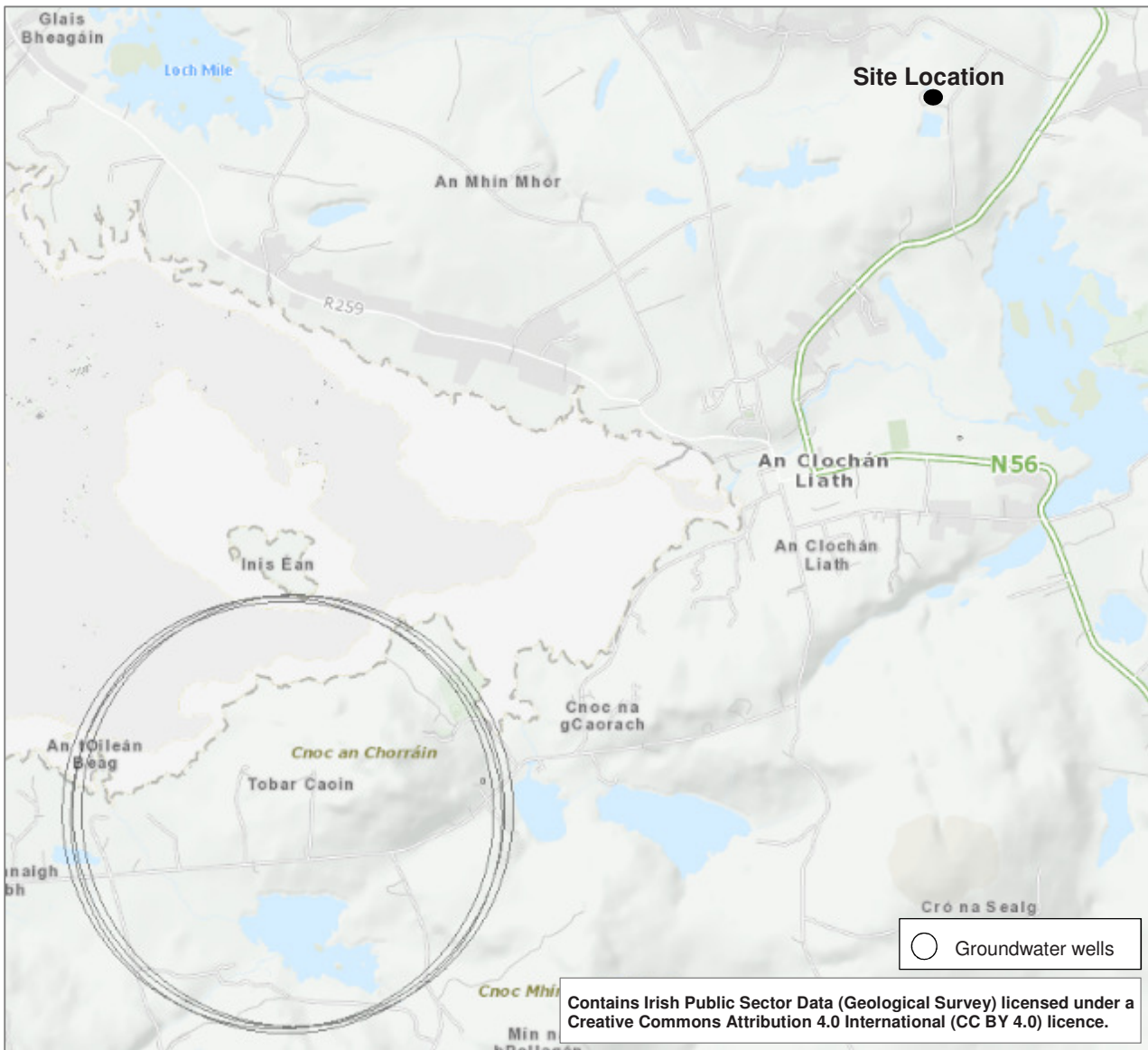


Figure 2.15 Groundwater Wells (taken from OSI Groundwater Data Viewer)<sup>3</sup>

The Rural Water section of Donegal County Council have indicated that there are no regulated private supplies from our Private Water Supply Programme in the this area of in Dungloe, however, there could be individual private wells.

## 2.9 National Water Monitoring Stations

Two national water monitoring stations were identified upstream and downstream of the as outlined in Table 2.2.below and shown on Figure 2.16.

<sup>3</sup> Locational Accuracy (meters) to 2km

REPORT

Table 2.2: National Water Monitoring Stations

Station Name	Bridge u/s Dungloe Lough	GLAIS_BHEAGÁIN-Interstitial Br d/s from Meela Lough
Station ID	RS38D830150	RS38G180970
Station Type	River Station	River Station
WFDWISECODE	IEMRRS38D830150	IEMRRS38G180970
WBWFDWISECODE	IE_NW_38D020250	IE_NW_38G180970
EPA Station Type WFDs	PreWfd	Investigative
Type of Water Monitored	River Water	River Water
River Basin District	North Western	North Western
Location	178115E, 412816N	173367.74E, 413665.5N
Q Value	2006: 4 (Good Status) 2003: 4 2000: 4-5 1997: 4 1994: 4 1990: 4 1985: 5 1980: 5	No results

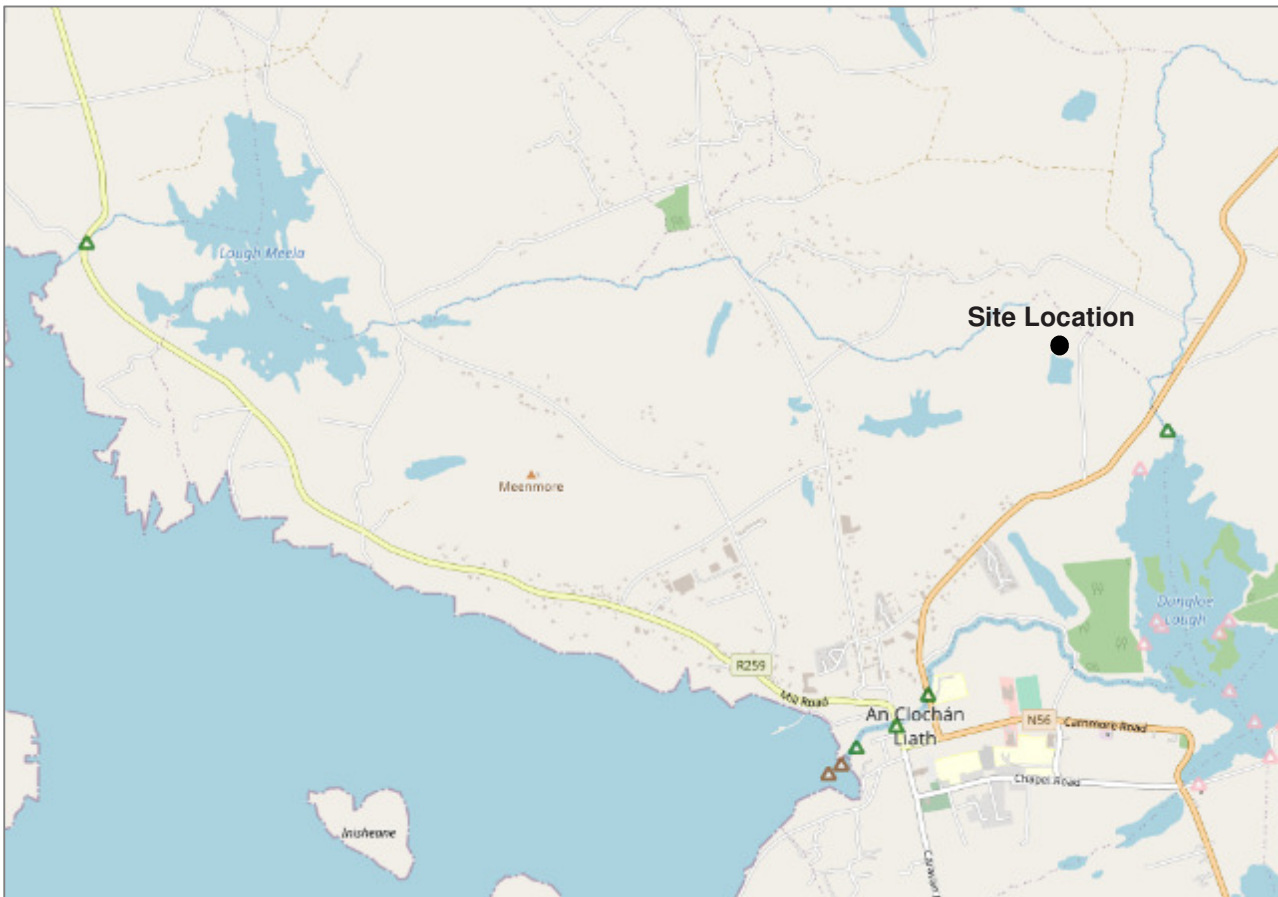


Figure 2.16 National Water Monitoring Stations (taken from EPA Maps)

## 2.10 Walkover Checklist

### 2.10.1 What is the Current Landuse

The site is a former landfill site which was operated by DCC between 1980 and 1999. The site is not enclosed by any fencing. The site is not being used currently for any activity by Donegal County Council. Access to site is via two entrances from the local road.

### 2.10.2 What is the Neighbouring Landuse

The surrounding land consists mainly of blanket bogland. Some of the adjoining fields were being used for turf cutting. Stockpiles of turf are located within the historic landfill site boundary. There is a right of way through the site to the surrounding commonage land. There are a number of residential properties to the north of the site.

### 2.10.3 What is the Size of the Site?

The estimated size of the site is approximately 3 Hectares (IBR1266/102 Site Boundary). The approximate area of waste is 1.44 hectares.

### 2.10.4 What is the Topography?

The site is located on the northern and eastern banks Lough Nacree in blanket bogland at an elevation of approximately 50 m OD.

### 2.10.5 Are There Potential Receptors Residents:

The nearest residents are within 250m of the site (to the northern boundary).

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

**Public water supplies:** There are no public water supplies in the vicinity of the site.

**Private Wells:** There are no private water supplies in the vicinity of the site.

**Surface water:** See 2.10.7 below.

**Services:** There is a puraflo system location to the North of the site. This is connected to electricity. There were no other services noted on the site.

**Other building:** There are currently none.

**Others:** Nil

### 2.10.6 Potential Sources of Contamination Surface waste:

There were a number of locations where surface waste was observed during the walkover. Wastes was noted along the northern and eastern boundary of the lake where the landfill working face had encroached into the lake (Picture 3 to 5). Surface waste was also noted in a number of other areas however this is thought to be due to more recent fly tipping.



**Picture 3 Wastes noted along the northern boundary of the lake**



**Picture 4 Wastes noted along the northern boundary of the lake**



**Picture 5 Wastes noted along the eastern boundary of the lake**

**Surface ponding of leachate:** There were no areas of surface ponding of leachate noted in the areas accessible on the day of the site visit except in the location from where leachate is pumped to the Puraflo system as shown in Picture 6.



**Picture 6 Leachate Pond/Wetland**

**Leachate seepage:** See above.

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

### **2.10.7 Are There Any Outfalls to Surface Water?**

As per section 1.3 of this report some remediation works have been undertaken on site. There were no other drainage ditches/surface water on site noted on the day of the site visit. Outfall to surface water are as follows (Drawing IBR1226/100 Leachate Management System).

1. From overflow pipe from the leachate storage /pumping tanks (Picture 7).
2. Seepages from under the leachate storage /pumping tanks(Picture 7)
3. Outflow pipe from the Puraflo system.



**Picture 7 Overflow pipe from the leachate storage /pumping tanks**

### 2.10.8 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: As per section 1.2 of this report some remediation works have been undertaken. Surface water within what was previously the natural outlet channel from the lake was noted to be a rust colour which could potentially be leachate or naturally occurring iron.

Odours: See 2.10.6 above in relation to landfill gas. No odours were observed from the site.

Litter: As noted in Section 210.6 above waste was noted along the northern and eastern boundaries of the lake. Wastes were also visible in other locations on site as shown in Picture 8 and 9. Some areas of the site are overgrown so no access was available.



**Picture 8 Construction and demolition waste.**



**Picture 9 Wood and carpet waste**

Gas bubbling through water: No gas bubbling through water was noted during the site visit in the accessible areas

Signs of settlement, subsidence, water logged areas: There were no signs of settlement, subsidence noted in the accessible areas. There were no other water logged areas noted on the site.

### 2.10.9 Are There Any Indications of Remedial Measures?

The disposed waste has been covered with a peat layer with areas of scrub and trees predominating the site. Leachate collection tanks and a Puraflo system has been installed at the facility as shown in Picture 10-12.



**Picture 10 Leachate Collection Tanks**



**Picture 11 Puraflo System**



**Picture 12 Puraflo System**

### **2.10.10 Describe Fences and Security Features**

The boundary of the site is not fenced. The site is a right of way for the turf cutting on commonage land and therefore cannot be secured. A gate on the entrance to the puraflor system has recently been installed by DCC.

## 3 PRELIMINARY SITE INVESTIGATION WORKS

### 3.1 Surface Water Monitoring

Surface water samples were collected during the walkover survey which was undertaken on Tuesday 13<sup>th</sup> of October, 2020 by Angela McGinley of RPS. The locations are provided in Table 3.1 and shown on Drawing IBR1266/101 and 102 Surface water sampling locations. The laboratory used for chemical analysis of soil and groundwater samples was ALS Laboratories. The laboratory is ISO 17025, UKAS and MCERT accredited. The analytical laboratory results are presented in Appendix B.

**Table 3.1: Surface Water locations**

Location	Description
SW1	Up gradient Lough Nacree
SW2	Down gradient Lough Nacree
SW3	Wetland Area
SW4	Discharge from under storage tanks
SW5	Stream at discharge point from Puraflo system. There was no discharge on day of sampling.
SW6	Downstream of the site. Access to a surface water location nearer to site was not possible on the sampling date due to soft ground. The nearest accessible sample location (SW6) is approximately 800m downstream of the site

All results as shown in Table 3.2 were compared with the following:

- European Communities Environmental Objectives (Surface Waters) Regulations 2009 and (Amendment) Regulations 2015 and 2019;
- European Union (Drinking Water) Regulations 2014.

#### 3.1.1 Results

The majority of contaminants concentrations are below their respective screening values were comparable or the limit of detection with the exception of the following;

- Elevated levels of Ammonia as NH<sub>3</sub> were recorded in surface waters samples SW3 and SW4. The EQS for Ammonia as NH<sub>3</sub> is 0.065 mg/l. Concentrations ranged between 0.0219 and 4.74 mg/l.
- Elevated levels of BOD was recorded in surface water sample SW3. The EQS for BOD is 2.6 mg/l. Concentrations ranged between <1 and 4.17 mg/l.
- Chemical Oxygen Demand (COD) levels ranged between 7.08 and 40.0 mg/l. The highest reading was at SW6.
- Elevated levels of Iron above the EQS (200 µg/l) were recorded at SW1, SW2, SW4 and SW6. Concentrations ranged between 0.0318 and 2.42 mg/l.
- Elevated levels of Manganese above the EQS (50 µg/l) were recorded at SW3 and SW4. Concentrations ranged between 4.68 and 212 mg/l.
- Orthophosphate was above the EQS of 0.025 mg/l at SW5. Concentrations ranged between <0.02 and 0.213 mg/l.
- Potassium was above the EPA IGV of 5mg/l at SW5 (5.22 mg/l).
- Positive detections for Cresols and Sum of Detected Monohydric Phenols above the laboratory limit of detection was detected in SW3 and SW4.

## REPORT

- There was one positive detections of Acenaphthene (aq) at SW3.
- There was one positive detections of SVOC TICs was recorded at SW6.

Elevated levels of Ammonia as NH<sub>3</sub> and manganese were detected within SW3 (Wetland Area) and SW4 (Discharge from under storage tanks) which are down stream of the waste material but within the site boundary. Elevated levels of Ammonia as NH<sub>3</sub> and Manganese at these locations may be attributed to the presence of the waste material at the site. It should be noted that Manganese occurs naturally in Donegal groundwater and this may therefore also contribute to the higher concentration of Manganese detected at these locations. Elevated levels of Ammonia as NH<sub>3</sub> were not detected at SW6.

**Table 3.2: Surface Water Results<sup>4</sup>**

Sample Description		SW01	SW02	SW03	SW04	SW05	SW06
Date Sampled		13/10/2020	13/10/2020	13/10/2020	13/10/2020	13/10/2020	13/10/2020
Received On		16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020
Carbon, Organic (diss.filt)	mg/l	9.34	8.43	7.43	6.72	3.76	18
Organic Carbon, Total Low Level	mg/l	10.4	9.31	10.6	10.1	13.8	17.9
Alkalinity, Total as CaCO <sub>3</sub>	mg/l	24.4	36.7	92.4	86.3	25	16.4
Ammoniacal Nitrogen as N	mg/l	<0.2	<0.2	<b>3.57</b>	<b>3.69</b>	<0.2	<0.2
Ammoniacal Nitrogen as N (low level)	mg/l	0.018	0.046	<b>3.73</b>	<b>3.9</b>	0.025	0.025
Ammoniacal Nitrogen Low as NH <sub>3</sub>	mg/l	0.0219	0.0559	<b>4.53</b>	<b>4.74</b>	0.0304	0.0304
BOD, unfiltered	mg/l	<1	<1	<b>4.17</b>	1.89	2.13	<1
Chloride	mg/l	28.5	29.8	34.7	33.9	18.5	27.6
COD, unfiltered	mg/l	31.5	20.1	19.9	26.1	7.08	44
Conductivity @ 20 deg.C	mS/cm	0.128	0.136	0.233	0.242	0.115	0.126
Cyanide, Total	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoride	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate as NO <sub>3</sub>	mg/l	0.594	0.788	<0.3	0.773	10.8	<0.3
Nitrite as NO <sub>2</sub>	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Kjeldahl	mg/l	<1	<1	4.4	4.27	<1	4.42
Nitrogen, Total	mg/l	<1	<1	4.4	4.45	3.18	<5
Organic nitrogen, Total	mg/l	<1	<1	<1	<1	<1	4.36
pH	pH Units	6.88	7.15	6.6	6.72	6.89	6.31
Phosphate (Ortho as P)	mg/l	<0.02	<0.02	<0.02	<0.02	<b>0.213</b>	<0.02
Sulphate	mg/l	<2	<2	<2	<2	<2	<2
Sulphide	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Suspended solids, Total	mg/l	20.1	3.6	30.6	20.4	11.8	<2
Total Oxidised Nitrogen as N	mg/l	0.137	0.183	<0.1	0.182	2.44	<0.1
Aluminium (diss.filt)	µg/l	16.9	13.3	<10	<10	19.6	145
Antimony (diss.filt)	µg/l	<1	<1	<1	<1	<1	<1
Arsenic (diss.filt)	µg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium (diss.filt)	µg/l	9.02	10.7	36.7	39.5	22.4	5.2
Beryllium (diss.filt)	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron (diss.filt)	µg/l	16.9	19.8	39.9	39.7	69.8	<10
Cadmium (diss.filt)	µg/l	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Calcium (Dis.Filt)	mg/l	8.18	9.71	20.9	23	37.3	5.11

<sup>4</sup> Exceedances of the Regulation are shown in bold

## REPORT

Sample Description		SW01	SW02	SW03	SW04	SW05	SW06
Date Sampled		13/10/2020	13/10/2020	13/10/2020	13/10/2020	13/10/2020	13/10/2020
Received On		16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020
Chromium (diss.filt)	µg/l	<1	<1	<1	<1	<1	<1
Copper (diss.filt)	µg/l	1.68	1.99	<0.3	<0.3	1.19	0.698
Iron (Dis.Filt)	mg/l	<b>0.648</b>	<b>0.665</b>	0.191	<b>2.42</b>	0.0318	<b>0.574</b>
Lead (diss.filt)	µg/l	0.544	0.435	<0.2	<0.2	<0.2	0.201
Low Level Hexavalent Chromium	mg/l	<0.003	<0.015	<0.003	<0.003	<0.003	<0.003
Magnesium (Dis.Filt)	mg/l	2.64	3.01	5.19	5.49	6.73	2.35
Manganese (diss.filt)	µg/l	8.92	11	<b>135</b>	<b>212</b>	4.68	14.2
Mercury (diss.filt)	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum (diss.filt)	µg/l	<3	<3	<3	<3	<3	<3
Nickel (diss.filt)	µg/l	0.463	0.611	<0.4	<0.4	<0.4	<0.4
Potassium (Dis.Filt)	mg/l	1.33	1.51	3.2	3.36	<b>5.22</b>	1.09
Selenium (diss.filt)	µg/l	<1	<1	<1	<1	<1	<1
Sodium (Dis.Filt)	mg/l	16.2	17.4	20.1	19.8	21.7	16
Vanadium (diss.filt)	µg/l	<1	<1	<1	<1	<1	<1
Zinc (diss.filt)	µg/l	8.42	7.86	7.98	2.28	46.5	7.52
Cresols (low level)	µg/l	<0.5	<0.5	20.4	16	<0.5	<0.5
Phenol (low level)	µg/l	<0.5	<0.5	<2.5	<2.5	<0.5	<0.5
Sum of Detected Monohydric Phenols	µg/l	<0.5	<0.5	20.4	16	<0.5	<0.5
Acenaphthene (aq)	µg/l	<0.005	<0.005	0.00501	<0.005	<0.005	<0.005
Fluorene (aq)	µg/l	<0.005	<0.005	0.0096	<0.005	<0.005	<0.005
Naphthalene (aq)	µg/l	<0.01	<0.01	0.013	<0.01	<0.01	<0.01

### 3.2 Trial Pitting

Eleven pits (TP01 to TP11) were excavated within and around the site ranging in depth between 0.3 and 3.0m bgl. The locations of the trial pits are presented in Drawing IBR1266/103 Trial Pit Locations. Trial pit logs are presented in Appendix C.

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. These preliminary trial pits indicate the presence mixed municipal waste (MMW) in 7 of the 12 trial pits.

Diffuse emission of leachate from waste body was noted along the northern boundary during the undertaken of the trial pits.

## 3.3 Soils Risk Assessment Methodology

### 3.3.1 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 Land Contamination Risk Management (LCRM) 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

### 3.3.2 Published Generic Site Assessment Criteria

In order to assess the human health and environmental risks posed by potential contaminants within the underlying soils, RPS undertook an initial screen of the laboratory results using the 2015 LQM/CIEH Suitable 4 Use Levels (S4ULs) (Copyright Land Quality management Limited reproduced with permission; Publication Number S4UL3474. All Rights Reserved) as trigger values. Where contamination results are recorded above these S4ULs, further assessment of the risks or remedial action may be needed.

These LQM/CIEH S4ULs replace the second edition of the LQM/CIEH Generic Assessment Criteria (GAC) published in 2009. Differences in modelling assumptions and added land uses and substances create the difference between these S4ULs and the previous GAC. These values are provided for 6 land use classifications:

- Residential with homegrown produce
- Residential without homegrown produce
- Allotments
- Commercial
- Public open space near residential housing
- Public open space Park

These values have been adopted within this investigation as they provide the most up to date trigger values that are based on appropriate and rationale assumptions. Similarly to the previous GAC, the S4ULs are provided for 1%, 2.5% and 6% soil organic matter (SOM). In the absence of complete analysis of SOM at the site, generic values derived for a SOM value of 1% have been utilised in the risk assessment where possible to ensure the most conservative approach is taken.

For pollutants with no relevant S4ULs, assessment criteria were provided by the following publications:

- Soil Guideline Values (SGVs)
- The Soil Generic Assessment Criteria (GAC) for Human Health Risk Assessment – CL:AIRE December 2009

In light of the publication of SR2 and SR3 the Environment Agency published 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
- Commercial

CL:AIRE in association with The Environmental Industries Commission (EIC) and Association of Geotechnical and Geo-environmental Specialists (AGS) published a set of Generic Assessment Criteria in 2009 for previously unpublished contaminants which are intended to complement the SGVs derived by the Environment Agency. 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%).

All soil samples have been screened against generic values derived for a commercial end use.

### 3.3.3 Ground Contamination Assessment

The soil laboratory analytical results are contained within Appendix B. No determination possible by the laboratory was noted for TP04 (1.8M) and TP09 for a number of parameters. The sample could not be filtered because it is too sludge-like.

Soil results have been screened against the latest available LQM/CIEH S4ULs for commercial end use:

- Metal concentrations were below the screening values for commercial end use;
- Although trace levels of hydrocarbons were recorded in soil samples across the site, no elevated levels of hydrocarbons were recorded above the relevant screening values for commercial end use. Therefore, the risks posed by hydrocarbons in the made ground/waste/subsoils to human health are considered to be low;
- Low level of PAH concentrations were recorded in the TP04 (at 1.3M) soil sample with a Total 16 PAH concentration of 429 ug/kg. There is no S4UL screening value for commercial end use for Total 16 PAH and concentrations of individual PAH parameters were below their respective screening values in TP04 (at 1.3m). PAH concentrations in the remaining soil samples were less than the laboratory limit of detection. Therefore, the risks posed by PAHs in soil across the site to human health are considered to be low.

### 3.3.4 Asbestos Containing Material (ACM)

No asbestos fibres were detected (Not Detected). Non-asbestos fibres were recorded in TP08.

## 3.4 Soil Leachate Testing

A number of soil samples were tested for soil leachate analysis to assess the mobility of chemical parameters within the waste material. The results were compared with the Groundwater EPA Interim Guideline values (IGVs) and the 2010/2016 Groundwater Threshold Values (GTV) for initial screening purposes.

The leachate methodology undertaken was the National Rivers Authority (NRA) leachate extract test which is considered most representative of natural site conditions. The procedure offers a simple basic test that is indicative of pollution under natural rainfall conditions. It however may not be appropriate for all types of analytes, particularly for organic contaminants. Therefore, the CEN 10:1 leachate test was also undertaken.

Soil leachate testing (NRA test methodology) was undertaken on 7 no. soil samples. Soil leachate testing (CEN 10:1 test methodology) was undertaken on 3 no. soil samples across the site. The results were compared with the IGVs and the GTV for initial screening purposes. The following parameters were above the IGV/GTV (NRA test methodology)

- Sulphate concentration of 205 mg/l was slightly above the IGV of 200 mg/l at TP04 (1.3M)
- Aluminium concentration of 180 mg/l was slightly above the GTV of 150 mg/l at TP10
- Iron concentration of 0.235/0.499/0.914 and 13 mg/l were above the IGV of 0.2 mg/l at TP04 (1.8M), TP05, TP08 and TP09.
- Total Aliphatics & Aromatics >C5-35 concentration of 330 µg/l was above the GTV of 7.5 µg/l at TP10

## REPORT

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- PAH Sum of EPA 16 detected of 0.105, 1.92, 0.383 and 0.772 µg/l were above the GTV of 0.075 µg/ at TP04 (1.3M), TP08, TP10 and TP11.
- Benzo(a)pyrene concentration of 0.00867 µg/l was above the GTV of 0.007.5 µg/l at TP08

The following parameters were above the IGV/GTV (CEN 10:1 test methodology)

- Sulphate concentration of 267 mg/l was above the IGV of 200 mg/l at TP08

### 3.5 Waste Acceptance Criteria (WAC)

WAC is used to determine whether a waste will be accepted at a particular type of landfill (Inert, Non Hazardous, Hazardous). WAC testing was undertaken on 3 no. soil samples across the site. These results indicate that sampled waste meets the criteria for Inert except TP08 (0.80m) where sulphate and TDS exceeded the inert waste landfill WAC limits.

## 4 CONCEPTUAL SITE MODEL AND RISK SCREENING EXERCISE

### 4.1 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 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 Drawings IBR1266/104 and 105 Conceptual Site Model

### 4.2 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 4.1 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 4.2). As can be seen in Section 1.1 based on the initial risk screening undertaken the Historical Disposal Site falls into Lowest Risk (Class C).

A rerun of Tier 1 Risk Assessment has been undertaken based on additional information obtained by site visits. This is shown in Table 4.1 and Table 4.2 below

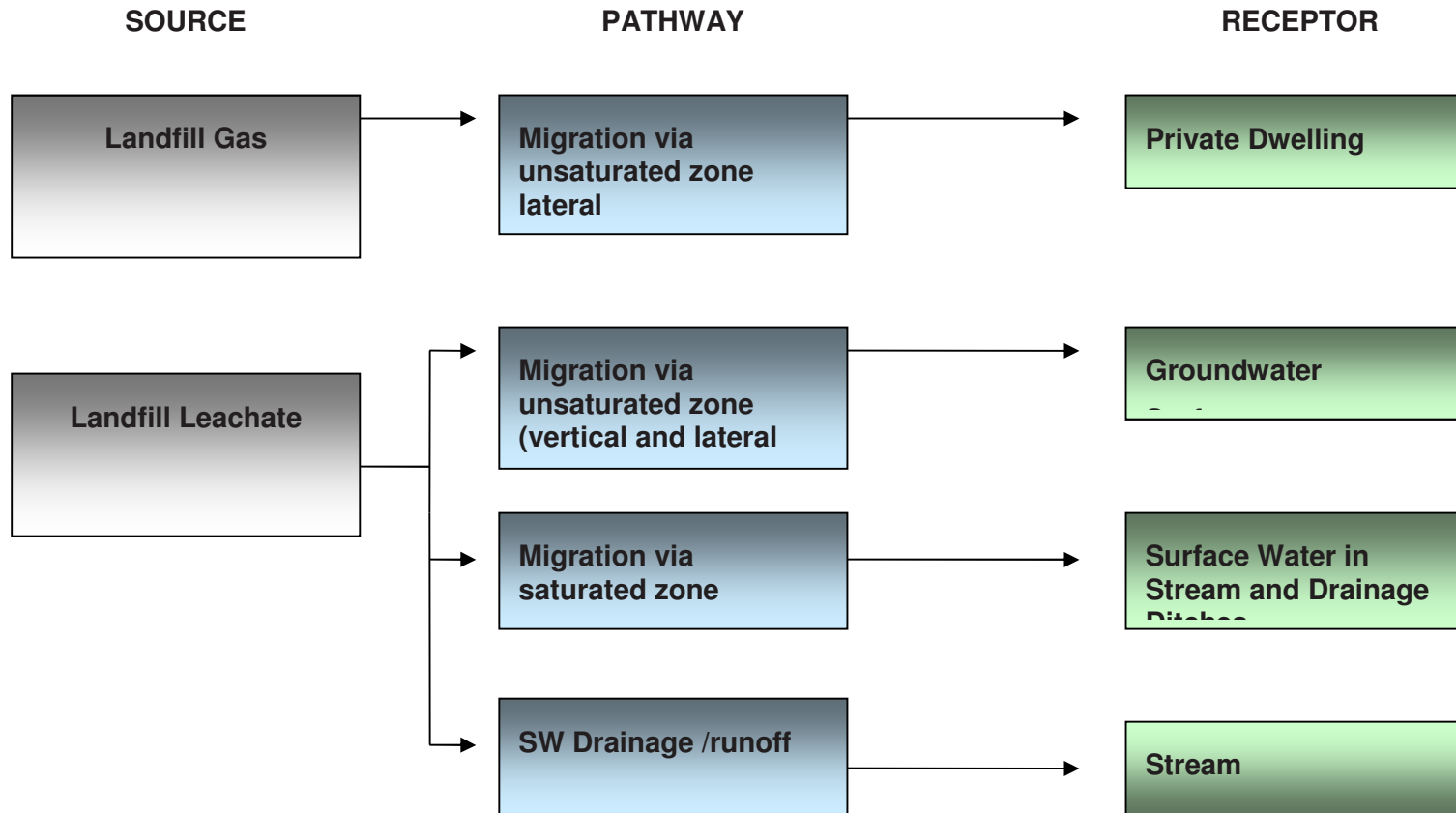


Figure 4.1 Network Diagram (Leachate Migration through Groundwater Surface Water Pathway and Landfill Gas Migration (Lateral))

**Table 4.1: Risk Screening Scores**

Table	Score	Rationale
1a Leachate Hazard	7	<i>The source/hazard (waste body) has a scoring matrix (Table 1a and 1b), which relates to the waste type and the area or volume of each of the individual waste types and age of the waste. Municipal &gt; 1 ≤ 5 ha = 7.</i> The estimated size of the site is approximately 3 Ha. Site operated by the Local Authority between 1980 and 1999 accepting municipal waste. Estimated waste tonnage = 25k tonnes.
1b Landfill Gas Hazard	7	<i>As above</i> The estimated size of the site is approximately 3Ha. Site operated by the Local Authority between 1980 and 1999 accepting municipal waste. Estimated waste tonnage = 25k tonnes.
2a Leachate Migration-GW Vulnerability	3	<i>The risk from leachate migration to a receptor is dependent on the groundwater vulnerability category. Extreme Vulnerability = 3</i> Extreme groundwater vulnerability indicating the groundwater can very readily and quickly receive water and potential contaminants from the subsurface.
2b Leachate Migration-GW Flow Regime	1	<i>Poorly Productive Bedrock Groundwater Bodies (LI, PI, Pu) = 1</i> PI Poor Aquifer with bedrock which is generally unproductive except for local yields
2c Leachate Migration-SW Drainage	2	<i>Surface water drainage gives an indication of the likelihood of runoff to surface waters via infiltration through waste and emerging as a spring/seep and moving as surface water runoff. Is there a direct connection between drainage ditches associated with the waste body and adjacent surface water body? Yes = 2</i> Lough Nacree and also the overflow/discharge to the lakes natural outlet channel
2d Landfill Gas -Lateral Migration	2	<i>LANDFILL GAS: PATHWAY assuming receptor within 250m of source. Bedrock = 2</i> The nearest resident is within 250m of the site. The site is anticipated to be underlain by blanket peat. Bedrock outcrops are present to the northwest and southeast of the site.
2e Landfill Gas -Vertical Migration	0	<i>Applies to situations where buildings, structures or other enclosed spaces are present above the waste body.</i> No receptors currently located above source. The subsoil on the site is classified as Blanket Peat.
3a Leachate Migration-Human Presence	2	<i>The scope of the term human occupation/presence refers to residential dwellings, commercial, leisure and industrial facilities. Greater than 50m but less than 250m of the waste body = 2</i> Greater than 50m but less than 250m of the waste body. No private wells are indicated on the GSI GW well map. There are no groundwater dependent terrestrial ecosystems

Table	Score	Rationale
3b Leachate Migration-Protected Areas	1	<i>Greater than 250m but less than 1km of waste body = 1</i> NHA/SAC Greater than 250m but less than 1km of waste body (Cloghernagore Bog and Glenveagh National Park SAC). NHA/SAC greater than 1km of the waste body (Rutland Island and Sound SAC). There are no groundwater dependent terrestrial ecosystems within 1km of the site. Corine data indicates that the site is located on a peat bog.
3c Leachate Migration-Aquifer Category	1	<i>Poor Aquifers (PI, Pu) = 1</i> PI Poor Aquifer with bedrock which is generally unproductive except for local yields
3d Leachate Migration-Public Water Supplies	0	<i>Greater than one 1km no karst aquifer =0</i> Extreme groundwater vulnerability indicating the groundwater can very readily and quickly receive water and potential contaminants from the subsurface. The area around Lough Nacree is classified as rock at or near the surface or karst.
3e Leachate Migration-Surface Water Bodies	3	<i>Surface Water Bodies Within 50m of site boundary = 3</i> The site is located adjacent to Lough Nacree and leachate is discharging from the site to the previous natural outlet channel from the lake
3f Landfill Gas - Human Presence	1	<i>Greater than 150m but less than 250m =1</i> The nearest resident is greater than 150m but less than 250m greater. The site is underlain by peat and a poor bedrock aquifer.

Table 4.2: Normalised Score

SPR	Equation	SPR Linkage Score	Maximum linkage score	Linkage	Normalised score %
1	$1aX(2a+2b+2c)X 3e$	126	300	Leachate Migration through groundwater and surface water	42.0
2	$1aX(2a+2b+2c)X 3e$ (SWDTE)	42	300	Leachate Migration through groundwater and surface water	14.0
3	$1aX(2a+2b)X 3a$	56	240	Leachate Migration through groundwater pathway	23.3
4	$1aX(2a+2b)X 3b$	28	240	Leachate Migration through groundwater pathway	11.7
5	$1aX(2a+2b)X 3c$	28	400	Leachate Migration through groundwater pathway	7.0
6	$1aX(2a+2b)X 3d$	0	560	Leachate Migration through groundwater pathway	0.0
7	$1aX(2a+2b)X 3e$	84	240	Leachate Migration through groundwater pathway	35.0
8	$1aX2cX 3e$	42	60	Leachate Migration through surface water pathway	70.0
9	$1aX2cX 3b$ (SWDTE)	14	60	Leachate Migration through surface water pathway	23.3
10	$1bX2dX 3f$	14	150	Landfill Migration Pathways	9.3
11	$1bX2eX 3f$	0	250	Landfill Migration Pathways	0.0

From these scores the site can be preliminarily assigned a risk classification (as per Table 4.3) which represents the intrinsic risk that the site poses to the environment.

**Table 4.3: Risk Classification (as per Table 5 of the Code, EPA)**

<b>Risk Classification</b>	<b>Range of Risk Scores</b>	
<b>Highest Risk (Class A)</b>	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.
<b>Moderate Risk (Class B)</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.
<b>Lowest Risk (Class C)</b>	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.

As can be seen in Tables 4.1 and 4.2 the Risk Screening Scores and Normalised Score has changed from the initial score shown in Table 1.1 which was undertaken using EPA web based data management system. This was due to risk screening score increasing for the following:

- 2c Leachate Migration-SW Drainage
- 3a Leachate Migration-Human Presence
- 3f Landfill Gas - Human Presence

As per section 1.3 of this report some remediation works have been undertaken on site. There were no drainage ditches/surface water on site noted on the day of the site visit however outfall to surface water is as follows:

1. From overflow pipe from the leachate storage /pumping tanks (Picture 7).
2. Seepages from under the from the leachate storage /pumping tanks(Picture 7)
3. Outflow pipe from the Puraflo system.

Surface water within what was previously the natural outlet channel from the lake was noted to be a rust colour which could potentially be leachate or naturally occurring iron. Surface water samples were taken from the seepages from under the leachate storage /pumping tanks (SW4) and indicate high levels of Ammonia as NH<sub>3</sub> (See section 3). Due to soft ground condition surface water samples from stream adjacent to the site could not be collected. The nearest accessible sample location (SW6) is approximately 800m downstream of the site. The potential risk from leachate to Lough Nacree and the adjacent stream needs to be investigated further. The nearest resident is greater than 150m but less than 250m greater which also increased the risk screening score. Based on the updated risk screening undertaken the Historical Disposal now falls into Highest Risk (Class A).

Highest Risk (Class A) is 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 for the linkage leachate migration through surface water pathway. Therefore it is recommend that a Tier 2 investigation is undertaken on site

## 5 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 waste area is approximately 1.44 hectares (See Drawing IBR1266/106 Site Boundary). Based on an average waste depth of 1.6m the estimated volume deposited at the site is 23,040m<sup>3</sup>. 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 "Household Waste compacted" has been chosen. This would equate to 9,216 tonnes of waste. A topographical survey and additional trial pits will be undertaken at the site and more detailed calculations can then be undertaken.

**Table 5.1: 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
Household Waste compacted	Non special, non-inert wastes from domestic premises, included collected household waste	0.4

## 6 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 **Highest Risk (Class A)** site is 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.

The site is Higher Risk as it scored greater than or equal to 70% for the following;

- **SPR 8** Leachate Migration through surface water pathway

A Tier 2 site investigation (SI) and sampling of the site to include trial pitting, waste, groundwater, surface water and leachate sampling should be undertaken in accordance with EPA Guidance. The proposed Tier 2 SI Scope for the Dungloe site is as follows:

- 6 Shallow Boreholes,
- 6 Deep Boreholes,
- 10 Trial Pits.

2 no. rounds of groundwater, surface water and landfill gas sampling should be undertaken from all monitoring wells across the site. A topographical survey should be completed on the site. It is also recommended that a drainage survey and hydrology/catchment study is undertaken to understand the source of water input into the lake (groundwater fed or from surface water and any other contamination sources in area).

Following completion of the above works, the information obtained should be used to refine the CSM developed for the site and the risk screening exercise repeated to confirm the initial risk ranking assigned to the site.

# Appendix A Drawings



Holding tanks overflow to SW4  
(SW3 also bypasses holding tanks  
to SW4 due to leakage)

Holding tanks

SW3 overflows into  
holding tanks

Leachate Lagoon

Overland flow from piped  
drainage to lagoon

Piped Drainage from  
Lake

Holding tanks pumped  
to Puraflow System

Puraflow System  
Discharged to SW5

Puraflow System

Diffuse emission of  
leachate from waste  
body

Leachate from lake  
moves through areas  
of waste to areas of  
peat

**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.
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Client  
  
Donegal County Council

Project  
Dungloe Tier 1

Title  
Leachate Management System

Project Number IBR1266	Sheet Size A3	Drawing Scale Nts
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Drawing Number  
**IBR1266/100**

Drawn By JC	Status Prelim	Revision -
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Checked By AMcG	Approved By AMcG	Date 08-12-20
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2. Existing Services.  
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Client  
**Donegal County Council**

Project  
**Dungloe Tier 1**

Title  
**Surface Water Monitoring Locations**

Project Number <b>IBR1266</b>	Sheet Size <b>A3</b>	Drawing Scale <b>Nts</b>
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Drawing Number  
**IBR1266/101**

Drawn By <b>JC</b>	Status <b>Prelim</b>	Revision <b>-</b>
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Checked By <b>AMcG</b>	Approved By <b>AMcG</b>	Date <b>08-12-20</b>
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**NOTES**

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Client  
**Donegal County Council**

Project  
**Dungloe Tier 1**

Title  
**Surface Water Sampling Location  
Off-site**

Project Number IBR1266	Sheet Size A3	Drawing Scale Nts
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Drawing Number  
**IBR1266/102**

Drawn By JC	Status Prelim	Revision -
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Checked By AMcG	Approved By AMcG	Date 08-12-20
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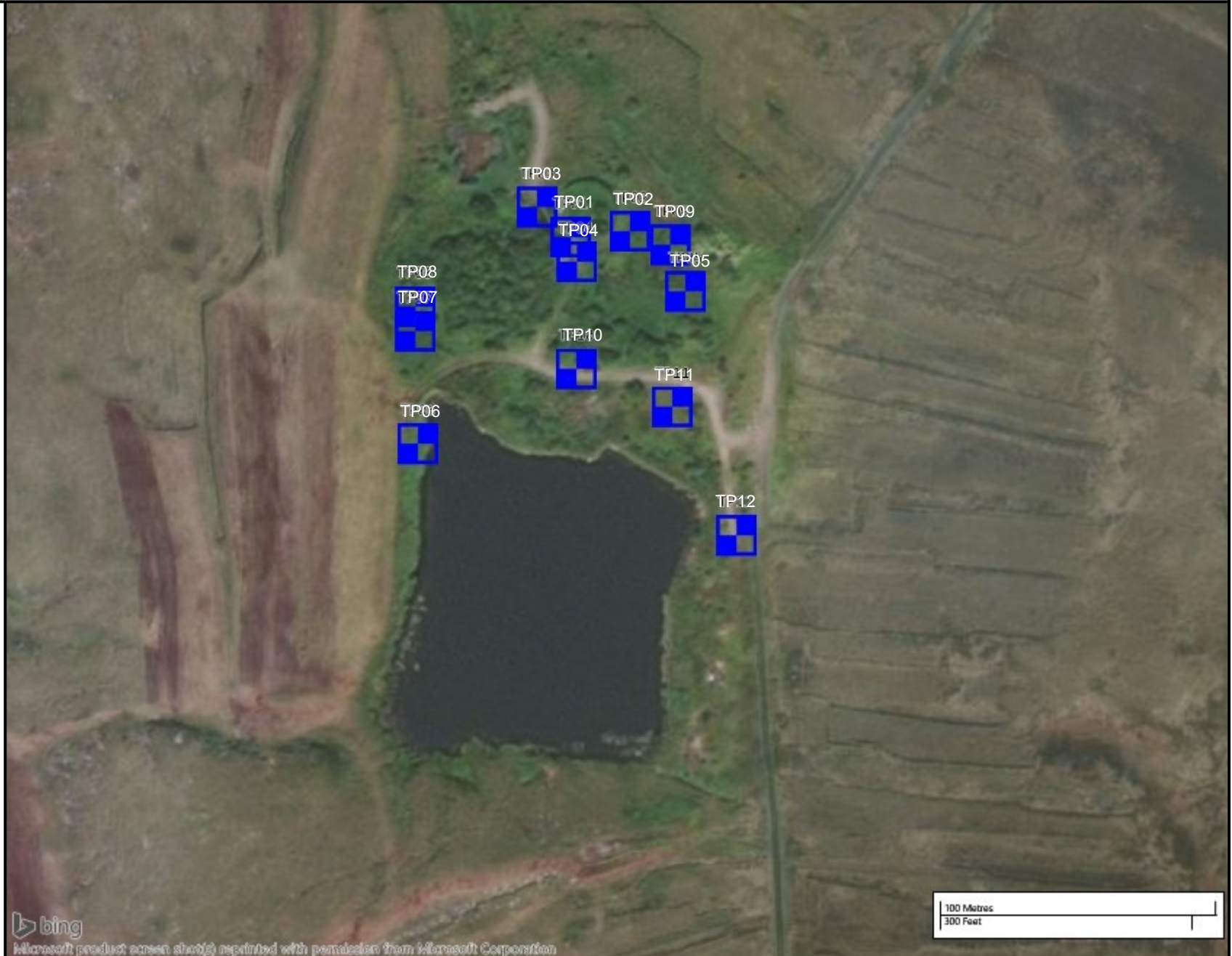
Project Id: IBR1266  
Project Title: Donegal Historic Landfills ERA  
Location: Dungloe, Co Donegal  
Client: Donegal County Council

Title: Site Plan  
Scale: 1:2000  
Engineer: Ciara Devine  
Contractor:



Legend Key

- Locations By Type - Empty
- Locations By Type - TP



**NOTES**

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2. Existing Services.  
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Client  
 Donegal County Council

Project  
 Dungloe Tier 1

Title  
 Preliminary Conceptual Site Model  
 Cross Section

Project Number IBR1266	Sheet Size A3	Drawing Scale Nts
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Drawing Number  
**IBR1266/104**

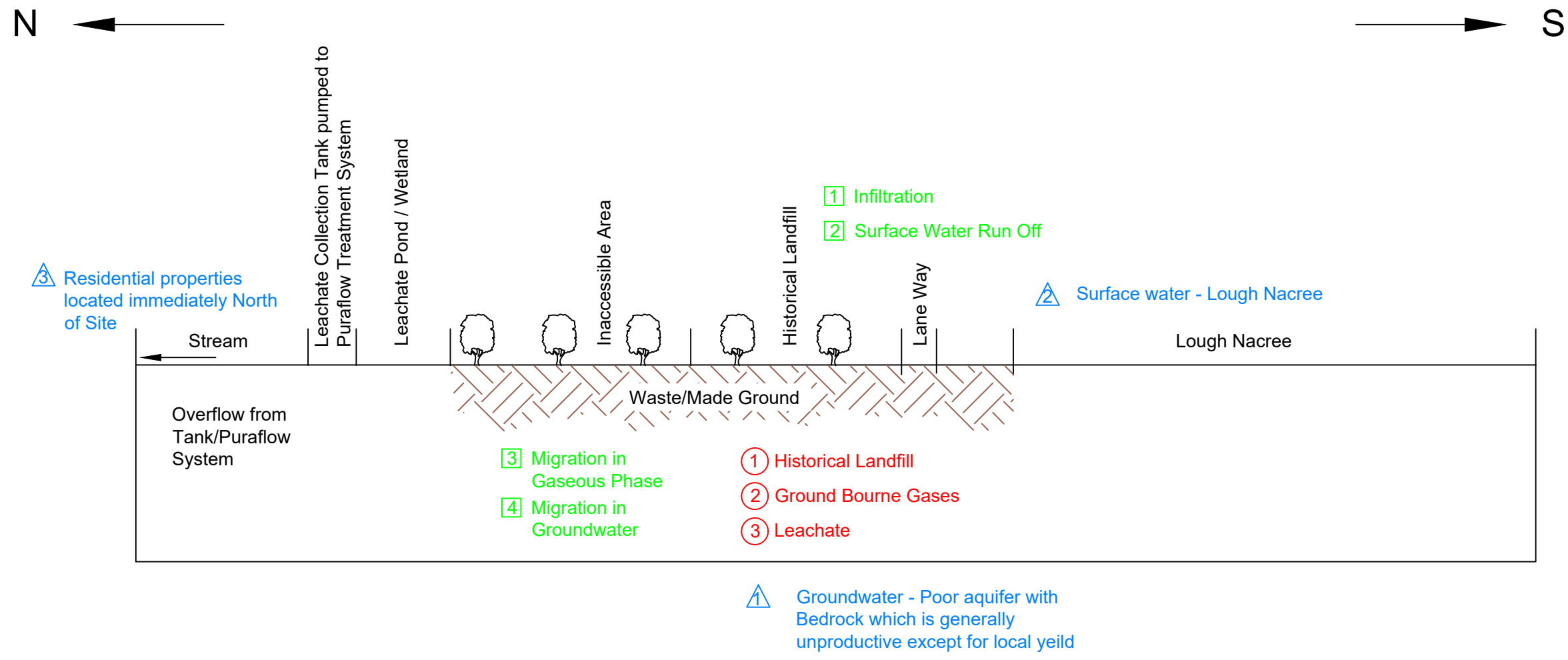
Drawn By JC	Status Prelim	Revision -
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Checked By AMcG	Approved By AMcG	Date 13-11-20
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- POTENTIAL ON-SITE SOURCES**
- 1 Historic Landfill
  - 2 Ground bourne gases
  - 3 Leachate

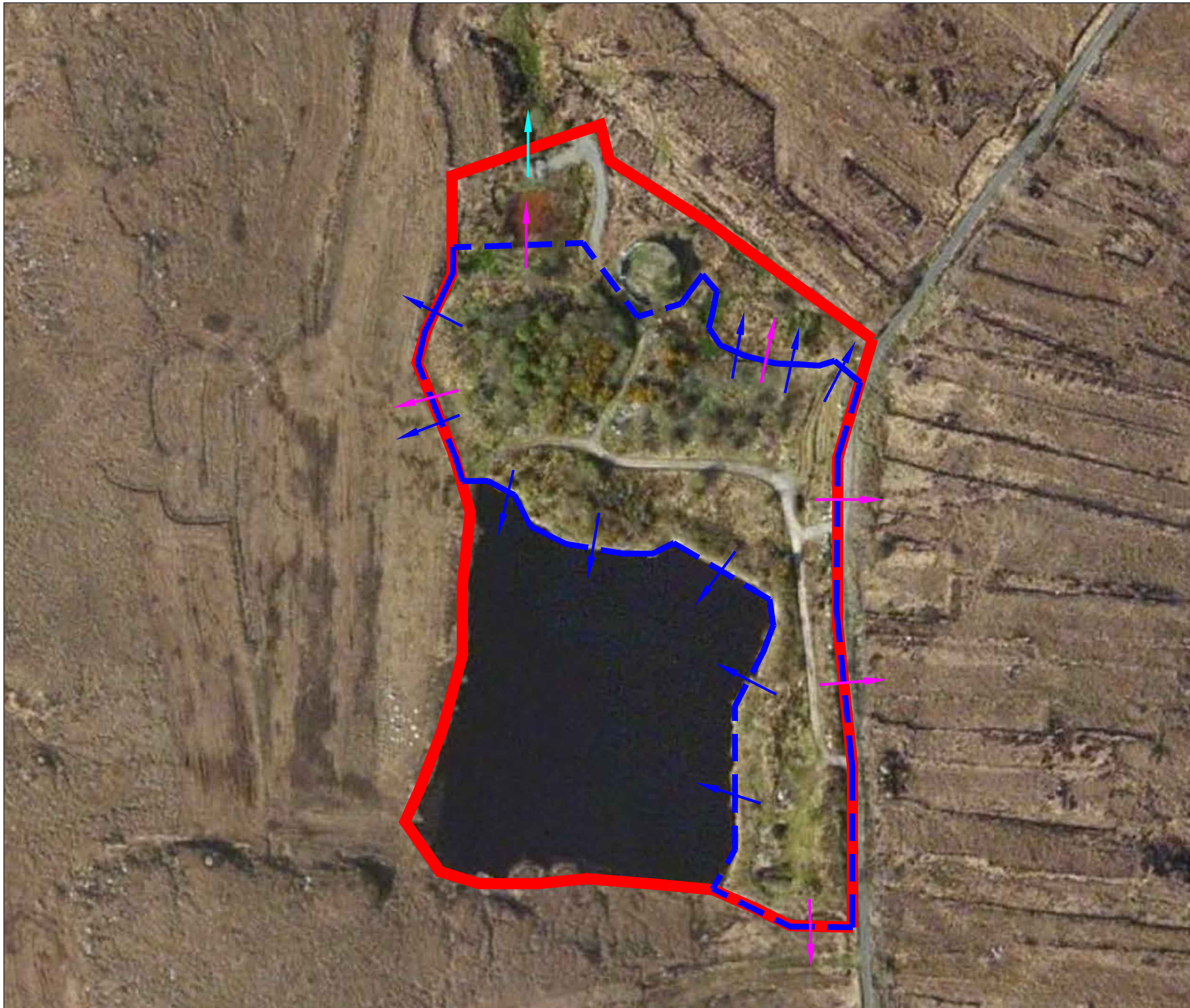
- POTENTIAL PATHWAYS**
- 1 Infiltration
  - 2 Surface water run-off
  - 3 Migration in gaseous phase
  - 4 Migration in groundwater

- POTENTIAL RECEPTORS**
- 1 Groundwater - Poor aquifer with Bedrock which is generally unproductive except for local yeild
  - 2 Surface water - Lough Nacree
  - 3 Residential properties located immediately north of site



N ←

→ S



**NOTES**

1. Verifying Dimensions.  
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5. Key

	Site Boundary - Including Services
	Approximate Extents of Waste
	Ground Borne Landfill Gas Emission
	Diffuse Emission of Leachate to Surface Water and Groundwater
	Overflo/By-pass leakage to SW

rev	amendments	check	date

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Client  
  
Donegal County Council

Project  
Dungloe Tier 1

Title  
Conceptual Site Model - Plan

Project Number IBR1266	Sheet Size A3	Drawing Scale Nts
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Drawing Number  
**IBR1266/105**

Drawn By MC	Status Prelim	Revision -
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Checked By AMcG	Approved By AMcG	Date 07-05-21
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**NOTES**

1. Verifying Dimensions.  
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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.
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	Site Boundary - Including Services
	Approximate Extents of Waste

rev	amendments	check	date

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Client

Donegal County Council

Project

Dungloe Tier 1

Title

Site Boundary

Project Number IBR1266	Sheet Size A3	Drawing Scale Nts
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Drawing Number

**IBR1266/106**

Drawn By JC	Status Prelim	Revision -
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Checked By AMcG	Approved By AMcG	Date 08-12-20
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# Appendix B Results



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Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

RPS Consultants Ltd  
Enterprise Fund Business Centre  
Ballyraine  
Letterkenny

**Attention:** Angela McGinley

## CERTIFICATE OF ANALYSIS

**Date of report Generation:** 12 May 2021  
**Customer:** RPS Consultants Ltd  
**Sample Delivery Group (SDG):** 201016-92  
**Your Reference:** IBRI266  
**Location:** Dungloe  
**Report No:** 597633

**This report has been revised and directly supersedes 573622 in its entirety.**

We received 6 samples on Friday October 16, 2020 and 6 of these samples were scheduled for analysis which was completed on Wednesday May 12, 2021. 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.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

**Sonia McWhan**

Operations Manager





# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201016-92      **Client Reference:** IBRI266      **Report Number:** 597633  
**Location:** Dungloe      **Order Number:** 240687404      **Superseded Report:** 573622

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23047378	SW01			13/10/2020
23047376	SW02			13/10/2020
23047375	SW03			13/10/2020
23047374	SW04			13/10/2020
23047377	SW05			13/10/2020
23047373	SW06			13/10/2020

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











# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b>	201016-92	<b>Client Reference:</b>	IBRI266	<b>Report Number:</b>	597633
<b>Location:</b>	Dungloe	<b>Order Number:</b>	240687404	<b>Superseded Report:</b>	573622

Results Legend	Lab Sample No(s)		2304/377												2304/373
	Customer Sample Reference		SW05												SW06
AGS Reference															
Depth (m)															
Container		H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	ZnAc (ALE246)	0.5l glass bottle (ALE227)	250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	ZnAc (ALE246)
Sample Type		SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Alkalinity as CaCO3	All	NDPs: 0 Tests: 6								X					
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 6	X									X			
Ammonium Low	All	NDPs: 0 Tests: 6	X									X			
Anions by Kone (w)	All	NDPs: 0 Tests: 6								X					
BOD True Total	All	NDPs: 0 Tests: 6							X						
COD Unfiltered	All	NDPs: 0 Tests: 6							X						
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 6								X					
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6			X								X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 6	X									X			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 6						X							
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 6						X							
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 6						X							
Fluoride	All	NDPs: 0 Tests: 6								X					
GRO by GC-FID (W)	All	NDPs: 0 Tests: 6				X								X	
Kjeldahl Nitrogen on liquids	All	NDPs: 0 Tests: 6								X					





# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b>	201016-92	<b>Client Reference:</b>	IBRI266	<b>Report Number:</b>	597633
<b>Location:</b>	Dungloe	<b>Order Number:</b>	240687404	<b>Superseded Report:</b>	573622

Results Legend			Customer Sample Ref.		SW01	SW02	SW03	SW04	SW05	SW06
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. - Subcontracted - refer to subcontractor report for accreditation status. - % 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 1-4*\$@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020
Component	LOD/Units	Method								
Suspended solids, Total	<2 mg/l	TM022	20.1 #	3.6 #	30.6 #	20.4 #	11.8 #	<2 #		
Alkalinity, Total as CaCO3	<2 mg/l	TM043	24.4 #	36.7 #	92.4 #	86.3 #	25 #	16.4 #		
BOD, unfiltered	<1 mg/l	TM045	<1 @ #	<1 @ #	4.17 @ #	1.89 @ #	2.13 @ #	<1 @ #		
Carbon, Organic (diss.filt)	<3 mg/l	TM090	9.34 #	8.43 #	7.43 #	6.72 #	3.76 #	18 #		
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #	<0.2 #	3.57 #	3.69 #	<0.2 #	<0.2 #		
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.018 #	0.046 #	3.73 #	3.9 #	0.025 #	0.025 #		
Ammoniacal Nitrogen Low as NH3	<0.01 mg/l	TM099	0.0219 #	0.0559 #	4.53 #	4.74 #	0.0304 #	0.0304 #		
Sulphide	<0.01 mg/l	TM101	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #		
Fluoride	<0.5 mg/l	TM104	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #		
COD, unfiltered	<7 mg/l	TM107	31.5 #	20.1 #	19.9 #	26.1 #	7.08 #	44 #		
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.128 #	0.136 #	0.233 #	0.242 #	0.115 #	0.126 #		
Aluminium (diss.filt)	<10 µg/l	TM152	16.9 #	13.3 #	<10 #	<10 #	19.6 #	145 #		
Antimony (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #		
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #		
Barium (diss.filt)	<0.2 µg/l	TM152	9.02 #	10.7 #	36.7 #	39.5 #	22.4 #	5.2 #		
Beryllium (diss.filt)	<0.1 µg/l	TM152	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #		
Boron (diss.filt)	<10 µg/l	TM152	16.9 #	19.8 #	39.9 #	39.7 #	69.8 #	<10 #		
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #		
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #		
Copper (diss.filt)	<0.3 µg/l	TM152	1.68 #	1.99 #	<0.3 #	<0.3 #	1.19 #	0.698 #		
Lead (diss.filt)	<0.2 µg/l	TM152	0.544 #	0.435 #	<0.2 #	<0.2 #	<0.2 #	0.201 #		
Manganese (diss.filt)	<3 µg/l	TM152	8.92 #	11 #	135 #	212 #	4.68 #	14.2 #		
Molybdenum (diss.filt)	<3 µg/l	TM152	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #		
Nickel (diss.filt)	<0.4 µg/l	TM152	0.463 #	0.611 #	<0.4 #	<0.4 #	<0.4 #	<0.4 #		
Selenium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #		
Vanadium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #		
Zinc (diss.filt)	<1 µg/l	TM152	8.42 #	7.86 #	7.98 #	2.28 #	46.5 #	7.52 #		
Sodium (Dis.Filt)	<0.076 mg/l	TM152	16.2 #	17.4 #	20.1 #	19.8 #	21.7 #	16 #		
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	2.64 #	3.01 #	5.19 #	5.49 #	6.73 #	2.35 #		
Potassium (Dis.Filt)	<0.2 mg/l	TM152	1.33 #	1.51 #	3.2 #	3.36 #	5.22 #	1.09 #		
Calcium (Dis.Filt)	<0.2 mg/l	TM152	8.18 #	9.71 #	20.9 #	23 #	37.3 #	5.11 #		
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.648 #	0.665 #	0.191 #	2.42 #	0.0318 #	0.574 #		
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #		



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 201016-92	<b>Client Reference:</b> IBRI266	<b>Report Number:</b> 597633	
<b>Location:</b> Dungloe	<b>Order Number:</b> 240687404	<b>Superseded Report:</b> 573622	

Results Legend			Customer Sample Ref.	SW01	SW02	SW03	SW04	SW05	SW06
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % 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 1-4*#@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference								
Component	LOD/Units	Method							
Nitrite as NO2	<0.05 mg/l	TM184	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	<2 mg/l	TM184	<2	<2	<2	<2	<2	<2	<2
Chloride	<2 mg/l	TM184	28.5	29.8	34.7	33.9	18.5	27.6	
Phosphate (Ortho as P)	<0.02 mg/l	TM184	<0.02	<0.02	<0.02	<0.02	0.213	<0.02	<0.02
Nitrate as NO3	<0.3 mg/l	TM184	0.594	0.788	<0.3	0.773	10.8	<0.3	
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	0.137	0.183	<0.1	0.182	2.44	<0.1	
PCB congener 28	<0.015 µg/l	TM197	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 52	<0.015 µg/l	TM197	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 101	<0.015 µg/l	TM197	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 118	<0.015 µg/l	TM197	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 138	<0.015 µg/l	TM197	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 153	<0.015 µg/l	TM197	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 180	<0.015 µg/l	TM197	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Sum of detected EC7 PCB's	<0.105 µg/l	TM197	<0.105	<0.105	<0.105	<0.105	<0.105	<0.105	<0.105
Nitrogen, Kjeldahl	<1 mg/l	TM212	<1	<1	4.4	4.27	<1	4.42	
Organic nitrogen, Total	<1 mg/l	TM212	<1	<1	<1	<1	<1	4.36	
Nitrogen, Total	<1 mg/l	TM212	<1	<1	4.4	4.45	3.18	<5	
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenol (low level)	<0.5 µg/l	TM255	<0.5	<0.5	<2.5	<2.5	<0.5	<0.5	<0.5
Cresols (low level)	<0.5 µg/l	TM255	<0.5	<0.5	20.4	16	<0.5	<0.5	<0.5
Xylenols (low level)	<0.5 µg/l	TM255	<0.5	<0.5	<2.5	<2.5	<0.5	<0.5	<0.5
Sum of Detected Monohydric Phenols	<0.5 µg/l	TM255	<0.5	<0.5	20.4	16	<0.5	<0.5	<0.5
pH	<1 pH Units	TM256	6.88	7.15	6.6	6.72	6.89	6.31	
Organic Carbon, Total Low Level	<0.1 mg/l	TM295	10.4	9.31	10.6	10.1	13.8	17.9	
Low Level Hexavalent Chromium	<0.003 mg/l	TM331	<0.003	<0.015	<0.003	<0.003	<0.003	<0.003	<0.003



# CERTIFICATE OF ANALYSIS

Validated

SDG: 201016-92  
Location: Dungloe

Client Reference: IBRI266  
Order Number: 240687404

Report Number: 597633  
Superseded Report: 573622

## PAH Spec MS - Aqueous (W)

Results Legend			Customer Sample Ref.	SW01	SW02	SW03	SW04	SW05	SW06
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
M	mCERTS accredited.			13/10/2020	13/10/2020	13/10/2020	13/10/2020	13/10/2020	13/10/2020
aq	Aqueous / settled sample.			16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020
diss.filt	Dissolved / filtered sample.			201016-92	201016-92	201016-92	201016-92	201016-92	201016-92
tot.unfilt	Total / unfiltered sample.			23047378	23047376	23047375	23047374	23047377	23047373
-	Subcontracted - refer to subcontractor report for accreditation status.								
**	% 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								
1-4*5@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
Naphthalene (aq)	<0.01 µg/l	TM178		<0.01 @ #	<0.01 @ #	0.013 @ #	<0.01 @ #	<0.01 @ #	<0.01 @ #
Acenaphthene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	0.00501 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Acenaphthylene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Fluoranthene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Anthracene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Phenanthrene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Fluorene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	0.0096 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Chrysene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Pyrene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178		<0.002 @ #	<0.002 @ #	<0.002 @ #	<0.002 @ #	<0.002 @ #	<0.002 @ #
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178		<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #	<0.005 @ #
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178		<0.082 @ #	<0.082 @ #	<0.082 @ #	<0.082 @ #	<0.082 @ #	<0.082 @ #



# CERTIFICATE OF ANALYSIS

Validated

SDG: 201016-92  
Location: Dungloe

Client Reference: IBRI266  
Order Number: 240687404

Report Number: 597633  
Superseded Report: 573622

## SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.	SW01	SW02	SW03	SW04	SW05	SW06
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)
M	mCERTS accredited.			13/10/2020	13/10/2020	13/10/2020	13/10/2020	13/10/2020	13/10/2020
aq	Aqueous / settled sample.			16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020
diss.filt	Dissolved / filtered sample.			201016-92	201016-92	201016-92	201016-92	201016-92	201016-92
tot.unfilt	Total / unfiltered sample.			23047378	23047376	23047375	23047374	23047377	23047373
Subcontracted - refer to subcontractor report for accreditation status. % 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 1-4*@\$@ Sample deviation (see appendix)									
Component	LOD/Units	Method							
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<4	<4	<4	<4	<4	<1	<4
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2-Chlorophenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2-Methylphenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2-Nitroaniline (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
2-Nitrophenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
3-Nitroaniline (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
4-Chloroaniline (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
4-Methylphenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
4-Nitroaniline (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
4-Nitrophenol (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Azobenzene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Acenaphthylene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Acenaphthene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Anthracene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<8 @ #	<8 @ #	<8 @ #	<8 @ #	<8 @ #	<2 @ #	<8 @ #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201016-92  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 597633  
**Superseded Report:** 573622

## SVOC MS (W) - Aqueous

Results Legend			Customer Sample Ref.	SW01	SW02	SW03	SW04	SW05	SW06
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% 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								
1-4*§@	Sample deviation (see appendix)								
Component	LOD/Units	Method	AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Carbazole (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Chrysene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Dibenzofuran (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Diethyl phthalate (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<20 @ #	<20 @ #	<20 @ #	<20 @ #	<5 @ #	<20 @ #
Fluoranthene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Fluorene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Pentachlorophenol (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Phenol (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Hexachloroethane (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Nitrobenzene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Naphthalene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Isophorone (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Phenanthrene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
Pyrene (aq)	<1 µg/l	TM176		<4 @ #	<4 @ #	<4 @ #	<4 @ #	<1 @ #	<4 @ #
SVOC TIC (aq)		TM176		Not Detected @	Not Detected @	Not Detected @	Not Detected @	Not Detected @	Detected @
Total SVOC TIC	<10 µg/l	TM176		<40	<40	<40	<40	<10	93.4
Butyl citrate	µg/l	TM176							93.4





# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201016-92  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 597633  
**Superseded Report:** 573622

**VOC MS (W)**

Results Legend			Customer Sample Ref.	SW01	SW02	SW03	SW04	SW05	SW06
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. - Subcontracted - refer to subcontractor report for accreditation status. - % 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 1-4*5@ Sample deviation (see appendix)	Depth (m)	Sample Type	SW01	SW02	SW03	SW04	SW05	SW06	SW06
	Date Sampled	Sample Time	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020
	Date Received	SDG Ref	16/10/2020 201016-92 23047378	16/10/2020 201016-92 23047376	16/10/2020 201016-92 23047375	16/10/2020 201016-92 23047374	16/10/2020 201016-92 23047377	16/10/2020 201016-92 23047373	16/10/2020 201016-92 23047373
	Lab Sample No.(s)	AGS Reference							
Component	LOD/Units	Method							
Dibromofluoromethane**	%	TM208	119	120	121	121	119	119	
Toluene-d8**	%	TM208	98.2	98.1	98.2	98.4	98	97.6	
4-Bromofluorobenzene**	%	TM208	101	101	101	99.7	100	101	
Dichlorodifluoromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Chloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Vinyl chloride	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Bromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Chloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Trichlorofluoromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
1,1-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Carbon disulphide	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Dichloromethane	<3 µg/l	TM208	<3 #	<3 #	<3 #	<3 #	<3 #	<3 #	
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
1,1-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
2,2-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Bromochloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Chloroform	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
1,1,1-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
1,1-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Carbontetrachloride	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
1,2-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Benzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Trichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
1,2-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Dibromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Bromodichloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
Toluene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	
1,3-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201016-92  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 597633  
**Superseded Report:** 573622

## VOC MS (W)

Results Legend			Customer Sample Ref.	SW01	SW02	SW03	SW04	SW05	SW06
# ISO17025 accredited. M mCERTS accredited. sq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % 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 1-4*§@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020	Surface Water (SW) 13/10/2020
<b>Component</b>	<b>LOD/Units</b>	<b>Method</b>							
Tetrachloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
o-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Styrene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #





# CERTIFICATE OF ANALYSIS

Validated

SDG: 201016-92  
Location: Dungloe

Client Reference: IBRI266  
Order Number: 240687404

Report Number: 597633  
Superseded Report: 573622

## Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 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
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: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and 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
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
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
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
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
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
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM255		Determination of Low Level Phenols in Waters and Leachates by HPLC
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
TM295	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Low Level Total Organic Carbon in Water
TM331		Low Level Hexavalent Chromium

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



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Validated

**SDG:** 201016-92  
**Location:** Dungloe

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**Order Number:** 240687404

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**Superseded Report:** 573622

## Test Completion Dates

Lab Sample No(s)	23047378	23047376	23047375	23047374	23047377	23047373
Customer Sample Ref.	SW01	SW02	SW03	SW04	SW05	SW06
AGS Ref.						
Depth						
Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Alkalinity as CaCO3	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	27-Oct-2020	27-Oct-2020
Ammoniacal Nitrogen	21-Oct-2020	21-Oct-2020	21-Oct-2020	23-Oct-2020	21-Oct-2020	23-Oct-2020
Ammonium Low	23-Oct-2020	23-Oct-2020	21-Oct-2020	23-Oct-2020	23-Oct-2020	12-May-2021
Anions by Kone (w)	26-Oct-2020	26-Oct-2020	27-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020
BOD True Total	22-Oct-2020	22-Oct-2020	22-Oct-2020	22-Oct-2020	22-Oct-2020	22-Oct-2020
COD Unfiltered	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020
Conductivity (at 20 deg.C)	28-Oct-2020	28-Oct-2020	28-Oct-2020	28-Oct-2020	28-Oct-2020	27-Oct-2020
Cyanide Comp/Free/Total/Thiocyanate	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020
Dissolved Metals by ICP-MS	28-Oct-2020	28-Oct-2020	28-Oct-2020	28-Oct-2020	28-Oct-2020	28-Oct-2020
Dissolved Organic/Inorganic Carbon	25-Oct-2020	25-Oct-2020	27-Oct-2020	27-Oct-2020	25-Oct-2020	27-Oct-2020
EPH CWG (Aliphatic) Aqueous GC (W)	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020
EPH CWG (Aromatic) Aqueous GC (W)	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020
Fluoride	26-Oct-2020	26-Oct-2020	23-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020
GRO by GC-FID (W)	22-Oct-2020	22-Oct-2020	22-Oct-2020	22-Oct-2020	22-Oct-2020	22-Oct-2020
Kjeldahl Nitrogen on liquids	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	28-Oct-2020
Low Level Hexavalent Chromium (w)	23-Oct-2020	23-Oct-2020	23-Oct-2020	23-Oct-2020	23-Oct-2020	26-Oct-2020
Low Level Phenols by HPLC (W)	20-Oct-2020	22-Oct-2020	21-Oct-2020	02-Nov-2020	20-Oct-2020	29-Oct-2020
Low Level TOC	18-Oct-2020	18-Oct-2020	18-Oct-2020	27-Oct-2020	18-Oct-2020	27-Oct-2020
Mercury Dissolved	24-Oct-2020	24-Oct-2020	24-Oct-2020	26-Oct-2020	24-Oct-2020	26-Oct-2020
Nitrite by Kone (w)	26-Oct-2020	26-Oct-2020	27-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020
PAH Spec MS - Aqueous (W)	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020
PCB Congeners - Aqueous (W)	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020
pH Value	23-Oct-2020	23-Oct-2020	23-Oct-2020	23-Oct-2020	23-Oct-2020	24-Oct-2020
Phosphate by Kone (w)	23-Oct-2020	23-Oct-2020	23-Oct-2020	23-Oct-2020	26-Oct-2020	26-Oct-2020
Sulphide	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020
Suspended Solids	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020
SVOC MS (W) - Aqueous	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020
Total Nitrogen	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	27-Oct-2020	28-Oct-2020
TPH CWG (W)	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020	26-Oct-2020
VOC MS (W)	22-Oct-2020	22-Oct-2020	22-Oct-2020	22-Oct-2020	22-Oct-2020	22-Oct-2020



# CERTIFICATE OF ANALYSIS

<b>SDG:</b>	201016-92	<b>Client Reference:</b>	IBRI266	<b>Report Number:</b>	597633
<b>Location:</b>	Dungloe	<b>Order Number:</b>	240687404	<b>Superseded Report:</b>	573622

## Appendix

## General

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 NH<sub>4</sub> by the BRE method, VOC TICs and SVOC TICs.

2. 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 6 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. ALS reserve the right to charge for samples received and stored but not analysed.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

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

11. 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.

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

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. 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.

15. 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.

16. 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.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

### 18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

### 19. Asbestos

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 (NDP). The quantity of asbestos present is not determined unless specifically requested.

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (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 ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

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

#### 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.

#### Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

**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.**



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RPS Consultants Ltd  
Enterprise Fund Business Centre  
Ballyraine  
Letterkenny

**Attention:** Angela McGinley

## CERTIFICATE OF ANALYSIS

**Date of report Generation:** 20 November 2020  
**Customer:** RPS Consultants Ltd  
**Sample Delivery Group (SDG):** 201112-94  
**Your Reference:** IBRI266  
**Location:** Dungloe  
**Report No:** 576544

We received 7 samples on Thursday November 12, 2020 and 7 of these samples were scheduled for analysis which was completed on Friday November 20, 2020. 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.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

**Sonia McWhan**

Operations Manager





# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94      **Client Reference:** IBRI266      **Report Number:** 576544  
**Location:** Dungloe      **Order Number:** 240687404      **Superseded Report:**

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
23229450	TP05		0.70	09/11/2020
23229451	TP08		0.80	09/11/2020
23229452	TP09		0.00	09/11/2020
23229453	TP10		1.10	09/11/2020
23229454	TP11		1.80	09/11/2020
23229448	TP04 1.3M		1.30	09/11/2020
23229449	TP04 1.8M		1.80	09/11/2020

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



# CERTIFICATE OF ANALYSIS

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<b>SDG:</b> 201112-94	<b>Client Reference:</b> IBRI266	<b>Report Number:</b> 576544
<b>Location:</b> Dungloe	<b>Order Number:</b> 240687404	<b>Superseded Report:</b>

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type
	X Test	N No Determination Possible									
Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other			23229450	TP05		0.70	1kg TUB with Handle (ALE210)	S			
			23229451	TP08		0.80	250g Amber Jar (ALE210)	S			
		23229452	TP09		0.00	1kg TUB with Handle (ALE260)	S				
		23229453	TP10		1.10	250g Amber Jar (ALE210)	S				
		23229454	TP11		1.80	60g VOC (ALE215)	S				
		23229448	TP04 1.3M		1.30	1kg TUB with Handle (ALE260)	S				
						250g Amber Jar (ALE210)	S				
						60g VOC (ALE215)	S				
						1kg TUB with Handle (ALE260)	S				
						250g Amber Jar (ALE210)	S				
						60g VOC (ALE215)	S				
						1kg TUB with Handle (ALE260)	S				
						250g Amber Jar (ALE210)	S				
						60g VOC (ALE215)	S				
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						60g VOC (ALE215)	S				
						1kg TUB with Handle (ALE260)	S				
						250g Amber Jar (ALE210)	S				
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						1kg TUB with Handle (ALE260)	S				
						250g Amber Jar (ALE210)	S				
						60g VOC (ALE215)	S				
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						1kg TUB with Handle (ALE260)	S				
						250g Amber Jar (ALE210)	S				
						60g VOC (ALE215)	S				
						1kg TUB with Handle (ALE260)	S				









# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

**Results Legend**

- X Test
- N No Determination Possible

**Sample Types -**

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- US - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container						Sample Type
					60g VOC (ALE215)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE260)	60g VOC (ALE215)	
	23229450	TP05		0.70	S	S	S	S	S	S	S
	23229451	TP08		0.80	S	S	S	S	S	S	S
	23229452	TP09		0.00	S	S	S	S	S	S	S
	23229453	TP10		1.10	S	S	S	S	S	S	S
	23229454	TP11		1.80	S	S	S	S	S	S	S
	23229448	TP04 1.3M		1.30	S	S	S	S	S	S	S
pH	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X
Phenols by HPLC (S)	All	NDPs: 1 Tests: 6			X	X	X	X	X	X	X
Phenols by HPLC (W)	All	NDPs: 0 Tests: 3			X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X
Stone count >2.00mm on dry sample	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 3			X	X	X	X	X	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X
Total Sulphate	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X
TPH CWG Filtered (W)	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X
VOC MS (S)	All	NDPs: 0 Tests: 7			X	X	X	X	X	X	X





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Validated

SDG: 201112-94  
Location: Dungloe

Client Reference: IBRI266  
Order Number: 240687404

Report Number: 576544  
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	Inclusions	Inclusions 2
23229450	TP05	0.70	Dark Brown	Sandy Silt Loam	Glass & Stones	Vegetation
23229451	TP08	0.80	Dark Brown	Peat	Glass & Stones	Vegetation
23229452	TP09	0.00	Dark Brown	Sludge	Vegetation	None
23229453	TP10	1.10	Dark Brown	Loamy Sand	Stones	Vegetation
23229454	TP11	1.80	Dark Brown	Sludge	Stones	Oil/Petroleum
23229448	TP04 1.3M	1.30	Dark Brown	Silt Loam	Stones	Plastic
23229449	TP04 1.8M	1.80	Dark Brown	Peat	Vegetation	None

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.



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<b>SDG:</b> 201112-94	<b>Client Reference:</b> IBRI266	<b>Report Number:</b> 576544
<b>Location:</b> Dungloe	<b>Order Number:</b> 240687404	<b>Superseded Report:</b>

Results Legend		Customer Sample Ref.	TP05	TP08	TP09	TP10	TP11	TP04 1.3M
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % 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 1-4*\$@ Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.70 Soil/Solid (S) 09/11/2020 12/11/2020 201112-94 23229450	0.80 Soil/Solid (S) 09/11/2020 12/11/2020 201112-94 23229451	0.00 Soil/Solid (S) 09/11/2020 12/11/2020 201112-94 23229452	1.10 Soil/Solid (S) 09/11/2020 12/11/2020 201112-94 23229453	1.80 Soil/Solid (S) 09/11/2020 12/11/2020 201112-94 23229454	1.30 Soil/Solid (S) 09/11/2020 12/11/2020 201112-94 23229448
Component	LOD/Units	Method						
Stones > 2 mm	<0.1 %	PM024	1.17	8.94	<0.1	36	1.52	0.975
Material Passing a 2mm Sieve	<0.1 %	PM024	98.8	91.1	100	64	98.5	99
Moisture Content Ratio (% of as received sample)	%	PM024	32	65	89	22	34	54
Loss on ignition	<0.7 %	TM018		35.3		7.02	8.88	
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01	<0.01	0.0912	<0.01
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	0.029	0.623	0.0246	0.106	<0.01
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015	<0.015	0.137	<0.015
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035	<0.035	0.623	<0.035	0.334	<0.035
Organic Carbon, Total	<0.2 %	TM132	2.84	21.3	23.8	2.48	3.14	16.9
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0284	0.213	0.238	0.0248	0.0314	0.169
Soil Organic Matter (SOM)	<0.35 %	TM132	4.9	36.7	41	4.28	5.41	29.1
pH	1 pH Units	TM133	7.71	6.83	6.69	7.83	7.42	7.47
Sulphur, Elemental	<10 mg/kg	TM136	60.2	1870	24.4	230	732	73.7
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Aluminium (diss.filt) NRA leach	<10 µg/l	TM152	153	52.2	36.1	180	217	34.7
Antimony (diss.filt) NRA leach	<1 µg/l	TM152	2.01	1.29	<1	2.02	1.16	1.55
Arsenic (diss.filt) NRA leach	<0.5 µg/l	TM152	<0.5	1.57	<0.5	0.844	0.672	0.624
Barium (diss.filt) NRA leach	<0.2 µg/l	TM152	52.6	42.1	242	5.4	8.25	37.2
Cadmium (diss.filt) NRA leach	<0.08 µg/l	TM152	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium (diss.filt) NRA leach	<1 µg/l	TM152	<1	<1	<1	<1	<1	<1
Copper (diss.filt) NRA leach	<0.3 µg/l	TM152	16.4	1.24	5.96	2.48	3.74	4.64
Lead (diss.filt) NRA leach	<0.2 µg/l	TM152	1.43	<0.2	<0.2	<0.2	0.214	0.275
Molybdenum (diss.filt) NRA leach	<3 µg/l	TM152	3.81	13.8	<3	6.29	4.04	3.67
Nickel (diss.filt) NRA leach	<0.4 µg/l	TM152	1.31	1.92	0.827	1.73	1.08	3.16
Selenium (diss.filt) NRA leach	<1 µg/l	TM152	<1	<1	<1	<1	<1	<1
Zinc (diss.filt) NRA leach	<1 µg/l	TM152	13.3	3.21	6.83	5.39	2.53	57.3
Iron (Dis.Filt) NRA leach	<0.019 mg/l	TM152	0.499	0.914	13	<0.019	0.0642	<0.019
Cyanide, Total	<1 mg/kg	TM153	<1	13.9	<1	<1	<1	<1
PCB congener 28	<3 µg/kg	TM168		<15		<3	<3	
PCB congener 52	<3 µg/kg	TM168		<15		<3	<3	
PCB congener 101	<3 µg/kg	TM168		<15		<3	<3	
PCB congener 118	<3 µg/kg	TM168		<15		<3	<3	
PCB congener 138	<3 µg/kg	TM168		<15		<3	<3	



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<b>SDG:</b> 201112-94	<b>Client Reference:</b> IBRI266	<b>Report Number:</b> 576544
<b>Location:</b> Dungloe	<b>Order Number:</b> 240687404	<b>Superseded Report:</b>

Results Legend		Customer Sample Ref.	TP05	TP08	TP09	TP10	TP11	TP04 1.3M
#	ISO17025 accredited.							
M	mCERTS accredited.							
sq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.	Depth (m)	0.70	0.80	0.00	1.10	1.80	1.30
**	% 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	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
(F)	Trigger breach confirmed	Date Sampled	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020
1-4*#@	Sample deviation (see appendix)	Date Received	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020
		SDG Ref	201112-94	201112-94	201112-94	201112-94	201112-94	201112-94
		Lab Sample No.(s)	23229450	23229451	23229452	23229453	23229454	23229448
		AGS Reference						
Component	LOD/Units	Method						
PCB congener 153	<3 µg/kg	TM168		<15		<3	<3	
				#		M	#	
PCB congener 180	<3 µg/kg	TM168		<15		<3	<3	
				#		M	#	
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168		<105		<21	<21	
Naphthalene (diss.filt) NRA leach	<0.01 µg/l	TM178	<0.01	0.104	0.012	0.21	0.0888	<0.01
Acenaphthene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.191	0.0103	0.0431	0.0288	<0.005
Acenaphthylene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.191	0.012	0.0446	0.0308	<0.005
Fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178	0.00551	0.261	<0.005	0.0128	0.0866	0.0349
Anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.0535	<0.005	<0.005	0.0331	0.00651
Phenanthrene (diss.filt) NRA leach	<0.005 µg/l	TM178	0.0151	0.497	0.0129	0.0275	0.215	0.0352
Fluorene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.237	<0.005	0.0345	0.194	<0.005
Chrysene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.0637	<0.005	<0.005	0.0178	0.00631
Pyrene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.209	<0.005	0.0108	0.0615	0.0224
Benzo(a)anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.0384	<0.005	<0.005	0.00677	<0.005
Benzo(b)fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.0375	<0.005	<0.005	0.00639	<0.005
Benzo(k)fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.0139	<0.005	<0.005	<0.005	<0.005
Benzo(a)pyrene (diss.filt) NRA leach	<0.002 µg/l	TM178	<0.002	0.00867	<0.002	<0.002	0.00296	<0.002
Dibenzo(a,h)anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(g,h,i)perylene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.00744	<0.005	<0.005	<0.005	<0.005
Indeno(1,2,3-cd)pyrene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005	0.00782	<0.005	<0.005	<0.005	<0.005
PAH Sum of EPA 16 detected (Diss filt) NRA leach	<0.082 µg/l	TM178	<0.082	1.92	<0.082	0.383	0.772	0.105
Sulphide, Easily liberated	<15 mg/kg	TM180	32.7	335	<15	25.7	<15	<15
			@ M	@ #	@ #	@ M	@ #	@ M
Chromium, Trivalent	<0.9 mg/kg	TM181	13.7	49	<0.9	5.83	9.71	41.3
Aluminium	<11 mg/kg	TM181	6140	14000	1460	7590	5310	11400
Antimony	<0.6 mg/kg	TM181	<0.6	<0.6	<0.6	<0.6	<0.6	2.09
			#	#	#	#	#	#
Arsenic	<0.6 mg/kg	TM181	4.08	7.65	18.8	1.62	3.08	6.88
			M	#	#	M	#	M
Barium	<0.6 mg/kg	TM181	75.7	223	680	40.4	97.6	314
			#	#	#	#	#	#
Boron	<0.7 mg/kg	TM181	14.3	30.8	38.4	4.17	10	27.4
			#	#	#	#	#	#
Cadmium	<0.02 mg/kg	TM181	0.175	0.342	2.26	0.216	0.0924	2.16
			M	#	#	M	#	M
Chromium	<0.9 mg/kg	TM181	13.7	49	<0.9	5.83	9.71	41.3
			M	#	#	M	#	M
Copper	<1.4 mg/kg	TM181	67.7	70.9	6.66	32.7	17.8	196
			M	#	#	M	#	M
Iron	<1000 mg/kg	TM181	16800	42900	245000	13800	14300	58000
			#	#	#	#	#	#
Lead	<0.7 mg/kg	TM181	31.1	188	<0.7	7.46	33.6	1600
			M	#	#	M	#	M
Mercury	<0.14 mg/kg	TM181	0.311	0.253	0.915	<0.14	<0.14	1.31
			M	#	#	M	#	M



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

Results Legend			Customer Sample Ref.	TP05	TP08	TP09	TP10	TP11	TP04 1.3M
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% 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								
1-4\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
				0.70	0.80	0.00	1.10	1.80	1.30
				09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020
				12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020
				201112-94	201112-94	201112-94	201112-94	201112-94	201112-94
				23229450	23229451	23229452	23229453	23229454	23229448
AGS Reference									
Molybdenum	<0.1 mg/kg	TM181		0.732	4.85	5.37	0.938	0.962	3.68
				#	#	#	#	#	#
Nickel	<0.2 mg/kg	TM181		8.5	42	1.46	5.32	9.1	44.1
				M	#	#	M	#	M
Selenium	<1 mg/kg	TM181		<1	1.21	<1	<1	<1	<1
				#	#	#	#	#	#
Zinc	<1.9 mg/kg	TM181		174	>500	92.3	196	70.7	2500
				M	#	#	M	#	M
ANC @ pH 4	<0.03 mol/kg	TM182			0.11		0.0859	0.0813	
ANC @ pH 6	<0.03 mol/kg	TM182			<0.03		<0.03	0.0412	
Mercury (diss.filt) NRA leach	<0.01 µg/l	TM183		0.0157	<0.01	<0.01	<0.01	<0.01	<0.01
Sulphate NRA leach	<2 mg/l	TM184		12.2	162	<2	47.2	26.8	205
Chloride NRA leach	<2 mg/l	TM184		<2	6.9	5.6	<2	<2	3.1
Sulphate, Total	<48 mg/kg	TM221		467	8570	1450	853	2680	5530
				M	#	#	M	#	M
Cyanide, Total NRA leach	<0.05 mg/l	TM227		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride (soluble)	<5 mg/kg	TM243		27.4	166		29.5	63.9	77.4
				M	#		M	#	M
Total Oxidised Nitrogen as N, 2:1 water soluble	<0.226 mg/kg	TM243		1.03	<0.226		0.271	<0.226	2.26
				@	@		@	@	@
pH (diss.filt) NRA leach	1 pH Units	TM256		8.17	7.97	7.51	8.08	8.1	7.98
Low Level Hexavalent Chromium NRA leach	<0.003 mg/l	TM331		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
PAH, Total Detected USEPA 16 + Coronene	<318 µg/kg	TM410		<318	<318	<318	<318	2190	429
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410			<10		<10	<10	
Coronene	<200 µg/kg	TM410		<200	<200	<200	<200	<200	<200
EPH Surrogate % recovery**	%	TM415			96.8		101	87.2	
Mineral Oil >C10-C40	<5 mg/kg	TM415			748		321	109	



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 201112-94	<b>Client Reference:</b> IBRI266	<b>Report Number:</b> 576544
<b>Location:</b> Dungloe	<b>Order Number:</b> 240687404	<b>Superseded Report:</b>

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
Stones > 2 mm	<0.1 %	PM024	TP04 1.8M	1.80	Soil/Solid (S)	09/11/2020		12/11/2020	201112-94	23229449	
Material Passing a 2mm Sieve	<0.1 %	PM024									
Moisture Content Ratio (% of as received sample)	%	PM024									
Organic Carbon, Total	<0.2 %	TM132									
Fraction Organic Carbon (FOC)	<0.002	TM132									
Soil Organic Matter (SOM)	<0.35 %	TM132									
pH	1 pH Units	TM133									
Sulphur, Elemental	<10 mg/kg	TM136									
Aluminium (diss.filt) NRA leach	<10 µg/l	TM152									
Antimony (diss.filt) NRA leach	<1 µg/l	TM152									
Arsenic (diss.filt) NRA leach	<0.5 µg/l	TM152									
Barium (diss.filt) NRA leach	<0.2 µg/l	TM152									
Cadmium (diss.filt) NRA leach	<0.08 µg/l	TM152									
Chromium (diss.filt) NRA leach	<1 µg/l	TM152									
Copper (diss.filt) NRA leach	<0.3 µg/l	TM152									
Lead (diss.filt) NRA leach	<0.2 µg/l	TM152									
Molybdenum (diss.filt) NRA leach	<3 µg/l	TM152									
Nickel (diss.filt) NRA leach	<0.4 µg/l	TM152									
Selenium (diss.filt) NRA leach	<1 µg/l	TM152									
Zinc (diss.filt) NRA leach	<1 µg/l	TM152									
Iron (Dis.Filt) NRA leach	<0.019 mg/l	TM152									
Cyanide, Total	<1 mg/kg	TM153									
Naphthalene (diss.filt) NRA leach	<0.01 µg/l	TM178									
Acenaphthene (diss.filt) NRA leach	<0.005 µg/l	TM178									
Acenaphthylene (diss.filt) NRA leach	<0.005 µg/l	TM178									
Fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178									
Anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178									
Phenanthrene (diss.filt) NRA leach	<0.005 µg/l	TM178									
Fluorene (diss.filt) NRA leach	<0.005 µg/l	TM178									
Chrysene (diss.filt) NRA leach	<0.005 µg/l	TM178									
Pyrene (diss.filt) NRA leach	<0.005 µg/l	TM178									
Benzo(a)anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178									
Benzo(b)fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178									



**CERTIFICATE OF ANALYSIS**

Validated

**SDG:** 201112-94      **Client Reference:** IBRI266      **Report Number:** 576544  
**Location:** Dungloe      **Order Number:** 240687404      **Superseded Report:**

Results Legend		Customer Sample Ref.	TP04 1.8M				
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% 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						
1-4*#@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Benzo(k)fluoranthene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005				
Benzo(a)pyrene (diss.filt) NRA leach	<0.002 µg/l	TM178	<0.002				
Dibenzo(a,h)anthracene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005				
Benzo(g,h,i)perylene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005				
Indeno(1,2,3-cd)pyrene (diss.filt) NRA leach	<0.005 µg/l	TM178	<0.005				
PAH Sum of EPA 16 detected (Diss filt) NRA leach	<0.082 µg/l	TM178	<0.082				
Sulphide, Easily liberated	<15 mg/kg	TM180	<15	@ #			
Aluminium	<11 mg/kg	TM181	2000				
Antimony	<0.6 mg/kg	TM181	<0.6	#			
Arsenic	<0.6 mg/kg	TM181	1.31	#			
Barium	<0.6 mg/kg	TM181	15	#			
Boron	<0.7 mg/kg	TM181	7.08	#			
Cadmium	<0.02 mg/kg	TM181	0.123	#			
Chromium	<0.9 mg/kg	TM181	1.52	#			
Copper	<1.4 mg/kg	TM181	6.05	#			
Iron	<1000 mg/kg	TM181	8740	#			
Lead	<0.7 mg/kg	TM181	22.2	#			
Mercury	<0.14 mg/kg	TM181	0.148	#			
Molybdenum	<0.1 mg/kg	TM181	0.888	#			
Nickel	<0.2 mg/kg	TM181	9.46	#			
Selenium	<1 mg/kg	TM181	2.58	#			
Zinc	<1.9 mg/kg	TM181	35.7	#			
Mercury (diss.filt) NRA leach	<0.01 µg/l	TM183	0.012				
Sulphate NRA leach	<2 mg/l	TM184	<10				
Chloride NRA leach	<2 mg/l	TM184	10.9				
Sulphate, Total	<48 mg/kg	TM221	946	#			
Cyanide, Total NRA leach	<0.05 mg/l	TM227	<0.05				
pH (diss.filt) NRA leach	1 pH Units	TM256	6.5				
Low Level Hexavalent Chromium NRA leach	<0.003 mg/l	TM331	<0.003				
PAH, Total Detected USEPA 16 + Coronene	<318 µg/kg	TM410	<318				
Coronene	<200 µg/kg	TM410	<200				



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 201112-94	<b>Client Reference:</b> IBRI266	<b>Report Number:</b> 576544
<b>Location:</b> Dungloe	<b>Order Number:</b> 240687404	<b>Superseded Report:</b>

## PAH by GCMS

Results Legend		Customer Sample Ref.	TP05	TP09	TP04 1.3M	TP04 1.8M		
#	ISO17025 accredited.							
M	mCERTS accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
aq	Aqueous / settled sample.		0.70	0.00	1.30	1.80		
diss.filt	Dissolved / filtered sample.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
tot.unfilt	Total / unfiltered sample.		09/11/2020	09/11/2020	09/11/2020	09/11/2020		
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% 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		12/11/2020	12/11/2020	12/11/2020	12/11/2020		
(F)	Trigger breach confirmed		201112-94	201112-94	201112-94	201112-94		
1-4*\$@	Sample deviation (see appendix)		23229450	23229452	23229448	23229449		
Component	LOD/Units		Method					
Naphthalene-d8 % recovery**	%		TM218	91.8	92.4	88.5	89.1	
Acenaphthene-d10 % recovery**	%	TM218	96.3	96.1	95.9	95.4		
Phenanthrene-d10 % recovery**	%	TM218	95.7	95.2	93	93.4		
Chrysene-d12 % recovery**	%	TM218	84.2	88.5	77.9	77.1		
Perylene-d12 % recovery**	%	TM218	82.7	89.6	76.2	72.5		
Naphthalene	<9 µg/kg	TM218	<9	<9	<9	<9		
Acenaphthylene	<12 µg/kg	TM218	<12	<12	<12	<12		
Acenaphthene	<8 µg/kg	TM218	<8	<8	<8	<8		
Fluorene	<10 µg/kg	TM218	<10	<10	<10	<10		
Phenanthrene	<15 µg/kg	TM218	<15	<15	<15	<15		
Anthracene	<16 µg/kg	TM218	<16	<16	<16	<16		
Fluoranthene	<17 µg/kg	TM218	<17	<17	45.9	<17		
Pyrene	<15 µg/kg	TM218	<15	<15	51.1	<15		
Benz(a)anthracene	<14 µg/kg	TM218	<14	<14	36.4	<14		
Chrysene	<10 µg/kg	TM218	<10	<10	63.9	<10		
Benzo(b)fluoranthene	<15 µg/kg	TM218	<15	<15	85.5	<15		
Benzo(k)fluoranthene	<14 µg/kg	TM218	<14	<14	<14	<14		
Benzo(a)pyrene	<15 µg/kg	TM218	<15	<15	37.1	<15		
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218	<18	<18	49.3	<18		
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	<23	<23	<23	<23		
Benzo(g,h,i)perylene	<24 µg/kg	TM218	<24	<24	60	<24		
PAH, Total Detected USEPA 16	<118 µg/kg	TM218	<118	<118	429	<118		



**CERTIFICATE OF ANALYSIS**

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

**Semi Volatile Organic Compounds**

Results Legend			Customer Sample Ref.	TP05	TP08	TP09	TP10	TP11	TP04 1.3M
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% 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								
1-4*\$@	Sample deviation (see appendix)								
		Depth (m)	0.70	0.80	0.00	1.10	1.80	1.30	
		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
		Date Sampled	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020
		Sample Time							
		Date Received	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020
		SDG Ref	201112-94	201112-94	201112-94	201112-94	201112-94	201112-94	201112-94
		Lab Sample No.(s)	23229450	23229451	23229452	23229453	23229454	23229448	
		AGS Reference							
Component	LOD/Units	Method							
Phenol	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Pentachlorophenol	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Nitrobenzene	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Isophorone	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Hexachloroethane	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Hexachlorobutadiene	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Hexachlorobenzene	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
n-Dioctyl phthalate	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Dimethyl phthalate	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Diethyl phthalate	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
n-Dibutyl phthalate	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	886
Dibenzofuran	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Carbazole	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Butylbenzyl phthalate	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157	<100	2710	<100	837	939	7870	
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
Azobenzene	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
4-Nitrophenol	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
4-Nitroaniline	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
4-Methylphenol	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
4-Chloroaniline	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
4-Bromophenylphenylether	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
3-Nitroaniline	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
2-Nitrophenol	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
2-Nitroaniline	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
2-Methylphenol	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100
2-Chlorophenol	<100 µg/kg	TM157	<100	<200	<100	<100	<100	<100	<100



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

## Semi Volatile Organic Compounds

Results Legend			Customer Sample Ref.	TP05	TP08	TP09	TP10	TP11	TP04 1.3M
#	ISO17025 accredited.								
M	mCERTS accredited.								
sq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% 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								
1-4*§@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
2,6-Dinitrotoluene	<100 µg/kg	TM157	0.70	<100	<200	<100	<100	<100	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157	0.80	<100	<200	<100	<100	<100	<100
2,4-Dimethylphenol	<100 µg/kg	TM157	0.00	<100	<200	<100	<100	<100	<100
2,4-Dichlorophenol	<100 µg/kg	TM157	1.10	<100	<200	<100	<100	<100	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157	1.80	<100	<200	<100	<100	<100	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157	1.30	<100	<200	<100	<100	<100	<100
1,4-Dichlorobenzene	<100 µg/kg	TM157	09/11/2020	<100	<200	<100	<100	<100	<100
1,3-Dichlorobenzene	<100 µg/kg	TM157	09/11/2020	<100	<200	<100	<100	<100	<100
1,2-Dichlorobenzene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
2-Chloronaphthalene	<100 µg/kg	TM157	12/11/2020	<100	<200	<100	<100	<100	<100
2-Methylnaphthalene	<100 µg/kg	TM157	201112-94	<100	<200	<100	<100	<100	<100
Acenaphthylene	<100 µg/kg	TM157	23229450	<100	<200	<100	<100	<100	<100
Acenaphthene	<100 µg/kg	TM157	23229451	<100	<200	<100	<100	<100	<100
Anthracene	<100 µg/kg	TM157	23229452	<100	<200	<100	<100	<100	<100
Benzo(a)anthracene	<100 µg/kg	TM157	23229453	<100	<200	<100	<100	<100	<100
Benzo(b)fluoranthene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Benzo(k)fluoranthene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Benzo(a)pyrene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Benzo(g,h,i)perylene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Chrysene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Fluoranthene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Fluorene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Phenanthrene	<100 µg/kg	TM157		<100	<200	<100	<100	331	<100
Pyrene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Naphthalene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
Bis(2-chloroisopropyl) ether	<100 µg/kg	TM157		<100	<200	<100	<100	<100	<100
TIC report		TM157		Not Detected	Detected	Not Detected	Detected	Detected	Detected
Total SVOC TIC	<100 µg/kg	TM157		<1000	13900	<1000	4190	1030	2190
Bisnorabietapentaene	mg/kg	TM157					3140		
Eicosane	µg/kg	TM157			2170				
Tetramethylhexadecane	mg/kg	TM157						1030	





**CERTIFICATE OF ANALYSIS**

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

**Semi Volatile Organic Compounds**

Results Legend		Customer Sample Ref.	TP04 1.8M			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.80 Soil/Solid (S) 09/11/2020			
M	mCERTS accredited.					
aq	Aqueous / settled sample.					
diss.filt	Dissolved / filtered sample.					
tot.unfilt	Total / unfiltered sample.					
*	Subcontracted - refer to subcontractor report for accreditation status.					
**	% 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					
1-4*#@	Sample deviation (see appendix)					
Component	LOD/Units			Method		
Phenol	<100 µg/kg	TM157	<100			
Pentachlorophenol	<100 µg/kg	TM157	<100			
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157	<100			
Nitrobenzene	<100 µg/kg	TM157	<100			
Isophorone	<100 µg/kg	TM157	<100			
Hexachloroethane	<100 µg/kg	TM157	<100			
Hexachlorocyclopentadiene	<100 µg/kg	TM157	<100			
Hexachlorobutadiene	<100 µg/kg	TM157	<100			
Hexachlorobenzene	<100 µg/kg	TM157	<100			
n-Dioctyl phthalate	<100 µg/kg	TM157	<100			
Dimethyl phthalate	<100 µg/kg	TM157	<100			
Diethyl phthalate	<100 µg/kg	TM157	<100			
n-Dibutyl phthalate	<100 µg/kg	TM157	<100			
Dibenzofuran	<100 µg/kg	TM157	<100			
Carbazole	<100 µg/kg	TM157	<100			
Butylbenzyl phthalate	<100 µg/kg	TM157	<100			
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157	<100			
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157	<100			
bis(2-Chloroethyl)ether	<100 µg/kg	TM157	<100			
Azobenzene	<100 µg/kg	TM157	<100			
4-Nitrophenol	<100 µg/kg	TM157	<100			
4-Nitroaniline	<100 µg/kg	TM157	<100			
4-Methylphenol	<100 µg/kg	TM157	<100			
4-Chlorophenylphenylether	<100 µg/kg	TM157	<100			
4-Chloroaniline	<100 µg/kg	TM157	<100			
4-Chloro-3-methylphenol	<100 µg/kg	TM157	<100			
4-Bromophenylphenylether	<100 µg/kg	TM157	<100			
3-Nitroaniline	<100 µg/kg	TM157	<100			
2-Nitrophenol	<100 µg/kg	TM157	<100			
2-Nitroaniline	<100 µg/kg	TM157	<100			
2-Methylphenol	<100 µg/kg	TM157	<100			
1,2,4-Trichlorobenzene	<100 µg/kg	TM157	<100			
2-Chlorophenol	<100 µg/kg	TM157	<100			



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

## Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	TP04 1.8M				
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% 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						
1-4*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
2,6-Dinitrotoluene	<100 µg/kg	TM157	<100				
2,4-Dinitrotoluene	<100 µg/kg	TM157	<100				
2,4-Dimethylphenol	<100 µg/kg	TM157	<100				
2,4-Dichlorophenol	<100 µg/kg	TM157	<100				
2,4,6-Trichlorophenol	<100 µg/kg	TM157	<100				
2,4,5-Trichlorophenol	<100 µg/kg	TM157	<100				
1,4-Dichlorobenzene	<100 µg/kg	TM157	<100				
1,3-Dichlorobenzene	<100 µg/kg	TM157	<100				
1,2-Dichlorobenzene	<100 µg/kg	TM157	<100				
2-Chloronaphthalene	<100 µg/kg	TM157	<100				
2-Methylnaphthalene	<100 µg/kg	TM157	<100				
Acenaphthylene	<100 µg/kg	TM157	<100				
Acenaphthene	<100 µg/kg	TM157	<100				
Anthracene	<100 µg/kg	TM157	<100				
Benzo(a)anthracene	<100 µg/kg	TM157	<100				
Benzo(b)fluoranthene	<100 µg/kg	TM157	<100				
Benzo(k)fluoranthene	<100 µg/kg	TM157	<100				
Benzo(a)pyrene	<100 µg/kg	TM157	<100				
Benzo(g,h,i)perylene	<100 µg/kg	TM157	<100				
Chrysene	<100 µg/kg	TM157	<100				
Fluoranthene	<100 µg/kg	TM157	<100				
Fluorene	<100 µg/kg	TM157	<100				
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157	<100				
Phenanthrene	<100 µg/kg	TM157	<100				
Pyrene	<100 µg/kg	TM157	<100				
Naphthalene	<100 µg/kg	TM157	<100				
Dibenzo(a,h)anthracene	<100 µg/kg	TM157	<100				
Bis(2-chloroisopropyl) ether	<100 µg/kg	TM157	<100				
TIC report		TM157	Detected				
Total SVOC TIC	<100 µg/kg	TM157	212000				
Ergostanol	mg/kg	TM157	35400				
Sitosterol	µg/kg	TM157	22000				
Unknown	mg/kg	TM157	155000				



# CERTIFICATE OF ANALYSIS

Validated

SDG: 201112-94  
Location: Dungloe

Client Reference: IBRI266  
Order Number: 240687404

Report Number: 576544  
Superseded Report:

## TPH CWG (S)

Results Legend			Customer Sample Ref.	TP05	TP08	TP09	TP10	TP11	TP04 1.3M
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% 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								
1-4*\$@	Sample deviation (see appendix)								
		Depth (m)	0.70	0.80	0.00	1.10	1.80	1.30	
		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
		Date Sampled	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020
		Sample Time							
		Date Received	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020
		SDG Ref	201112-94	201112-94	201112-94	201112-94	201112-94	201112-94	201112-94
		Lab Sample No.(s)	23229450	23229451	23229452	23229453	23229454	23229448	
		AGS Reference							
Component	LOD/Units	Method							
GRO Surrogate % recovery**	%	TM089	79	103	79.7	118	82.4	72.8	
Aliphatics >C5-C6	<10 µg/kg	TM089	<10	92.8	<10	<100	24.3	<10	
Aliphatics >C6-C8	<10 µg/kg	TM089	<10	247	<10	305	56.2	<10	
Aliphatics >C8-C10	<10 µg/kg	TM089	<10	1570	<10	9690	1250	<10	
Aliphatics >C10-C12	<1000 µg/kg	TM414	<1000	132000	<1000	5810	9470	<1000	
Aliphatics >C12-C16	<1000 µg/kg	TM414	<1000	29400	<1000	6020	31100	<1000	
Aliphatics >C16-C21	<1000 µg/kg	TM414	5530	58400	13700	39700	87200	25200	
Aliphatics >C21-C35	<1000 µg/kg	TM414	26800	609000	32900	155000	235000	121000	
Aliphatics >C35-C44	<1000 µg/kg	TM414	4600	325000	14800	33900	89200	68300	
Total Aliphatics >C10-C44	<5000 µg/kg	TM414	36900	1150000	61400	240000	452000	214000	
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414	188000	1630000	171000	424000	944000	836000	
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10	<10	<10	<100	<10	<10	
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10	17.4	<10	<100	<10	<10	
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10	1050	<10	6460	831	<10	
Aromatics > EC10-EC12	<1000 µg/kg	TM414	<1000	20400	<1000	<1000	4690	<1000	
Aromatics > EC12-EC16	<1000 µg/kg	TM414	<1000	20100	<1000	1450	26300	<1000	
Aromatics > EC16-EC21	<1000 µg/kg	TM414	2990	81500	13800	17100	50400	10900	
Aromatics > EC21-EC35	<1000 µg/kg	TM414	119000	312000	49200	151000	371000	570000	
Aromatics >EC35-EC44	<1000 µg/kg	TM414	29100	45000	46500	13500	39000	40700	
Aromatics > EC40-EC44	<1000 µg/kg	TM414	9460	5950	14700	1490	5780	8070	
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414	151000	479000	110000	184000	492000	622000	
Total Aliphatics & Aromatics >C5-C44	<10000 µg/kg	TM414	188000	1640000	171000	440000	946000	836000	
Total Aliphatics >C5-C10	<50 µg/kg	TM089	<50	1910	<50	9990	1330	<50	
Total Aromatics >EC5-EC10	<50 µg/kg	TM089	<50	1070	<50	6460	831	<50	
GRO >C5-C10	<20 µg/kg	TM089	<20	2980	<20	16400	2160	<20	





# CERTIFICATE OF ANALYSIS

Validated

SDG: 201112-94  
Location: Dungloe

Client Reference: IBRI266  
Order Number: 240687404

Report Number: 576544  
Superseded Report:

## TPH CWG (W)

Results Legend			Customer Sample Ref.	TP05	TP08	TP09	TP10	TP11	TP04 1.3M
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% 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								
1-4*\$@	Sample deviation (see appendix)								
		Depth (m)	0.70	0.80	0.00	1.10	1.80	1.30	
		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
		Date Sampled	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020	09/11/2020
		Sample Time							
		Date Received	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020	12/11/2020
		SDG Ref	201112-94	201112-94	201112-94	201112-94	201112-94	201112-94	201112-94
		Lab Sample No.(s)	23229450	23229451	23229452	23229453	23229454	23229448	
		AGS Reference							
Component	LOD/Units	Method							
GRO Surrogate % recovery**	%	TM245	113	101	106	97	102	111	
NRA leach									
GRO >C5-C12 NRA leach	<50 µg/l	TM245	<50	<50	<50	329	<50	<50	
Methyl tertiary butyl ether (MTBE) NRA leach	<3 µg/l	TM245	<3	<3	<3	<3	<3	<3	
Benzene NRA leach	<7 µg/l	TM245	<7	<7	<7	<7	<7	<7	
Toluene NRA leach	<4 µg/l	TM245	<4	<4	<4	<4	<4	<4	
Ethylbenzene NRA leach	<5 µg/l	TM245	<5	<5	<5	<5	<5	<5	
m,p-Xylene NRA leach	<8 µg/l	TM245	<8	<8	<8	<8	<8	<8	
o-Xylene NRA leach	<3 µg/l	TM245	<3	<3	<3	<3	<3	<3	
Sum of detected Xylenes NRA leach	<11 µg/l	TM245	<11	<11	<11	<11	<11	<11	
Sum of detected BTEX NRA leach	<28 µg/l	TM245	<28	<28	<28	<28	<28	<28	
Aliphatics >C5-C6 NRA leach	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10	
Aliphatics >C6-C8 NRA leach	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10	
Aliphatics >C8-C10 NRA leach	<10 µg/l	TM245	<10	<10	<10	67	<10	<10	
Aliphatics >C10-C12 NRA leach	<10 µg/l	TM245	<10	<10	<10	124	<10	<10	
Aliphatics >C12-C16 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	<10	<10	<10	
Aliphatics >C16-C21 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	<10	<10	<10	
Aliphatics >C21-C35 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	<10	<10	<10	
Total Aliphatics >C12-C35 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	<10	<10	<10	
Aromatics >EC5-EC7 NRA leach	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10	
Aromatics >EC7-EC8 NRA leach	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10	
Aromatics >EC8-EC10 NRA leach	<10 µg/l	TM245	<10	<10	<10	47	<10	<10	
Aromatics >EC10-EC12 NRA leach	<10 µg/l	TM245	<10	<10	<10	82	<10	<10	
Aromatics >EC12-EC16 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	<10	<10	<10	
Aromatics >EC16-EC21 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	<10	<10	<10	
Aromatics >EC21-EC35 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	<10	<10	<10	
Aromatics >EC16-EC35 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	<10	<10	<10	
Total Aromatics >EC12-EC35 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	<10	<10	<10	
Total Aliphatics & Aromatics >C5-35 (diss.filt) NRA leach	<10 µg/l	TM174	<10	<10	<10	330	<10	<10	



**CERTIFICATE OF ANALYSIS**

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

**TPH CWG (W)**

Results Legend		Customer Sample Ref.	TP04 1.8M				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	1.80 Soil/Solid (S) 09/11/2020				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% 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						
1-4*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
GRO Surrogate % recovery** NRA leach	%	TM245	104				
GRO >C5-C12 NRA leach	<50 µg/l	TM245	<50				
Methyl tertiary butyl ether (MTBE) NRA leach	<3 µg/l	TM245	<3				
Benzene NRA leach	<7 µg/l	TM245	<7				
Toluene NRA leach	<4 µg/l	TM245	<4				
Ethylbenzene NRA leach	<5 µg/l	TM245	<5				
m,p-Xylene NRA leach	<8 µg/l	TM245	<8				
o-Xylene NRA leach	<3 µg/l	TM245	<3				
Sum of detected Xylenes NRA leach	<11 µg/l	TM245	<11				
Sum of detected BTEX NRA leach	<28 µg/l	TM245	<28				
Aliphatics >C5-C6 NRA leach	<10 µg/l	TM245	<10				
Aliphatics >C6-C8 NRA leach	<10 µg/l	TM245	<10				
Aliphatics >C8-C10 NRA leach	<10 µg/l	TM245	<10				
Aliphatics >C10-C12 NRA leach	<10 µg/l	TM245	<10				
Aliphatics >C12-C16 (diss.filt) NRA leach	<10 µg/l	TM174	<10				
Aliphatics >C16-C21 (diss.filt) NRA leach	<10 µg/l	TM174	<10				
Aliphatics >C21-C35 (diss.filt) NRA leach	<10 µg/l	TM174	<10				
Total Aliphatics >C12-C35 (diss.filt) NRA leach	<10 µg/l	TM174	<10				
Aromatics >EC5-EC7 NRA leach	<10 µg/l	TM245	<10				
Aromatics >EC7-EC8 NRA leach	<10 µg/l	TM245	<10				
Aromatics >EC8-EC10 NRA leach	<10 µg/l	TM245	<10				
Aromatics >EC10-EC12 NRA leach	<10 µg/l	TM245	<10				
Aromatics >EC12-EC16 (diss.filt) NRA leach	<10 µg/l	TM174	<10				
Aromatics >EC16-EC21 (diss.filt) NRA leach	<10 µg/l	TM174	<10				
Aromatics >EC21-EC35 (diss.filt) NRA leach	<10 µg/l	TM174	<10				
Aromatics >EC16-EC35 (diss.filt) NRA leach	<10 µg/l	TM174	<10				
Total Aromatics >EC12-EC35 (diss.filt) NRA leach	<10 µg/l	TM174	<10				
Total Aliphatics & Aromatics >C5-35 (diss.filt) NRA leach	<10 µg/l	TM174	<10				



# CERTIFICATE OF ANALYSIS

Validated

SDG: 201112-94  
Location: Dungloe

Client Reference: IBRI266  
Order Number: 240687404

Report Number: 576544  
Superseded Report:

## VOC MS (S)

Results Legend			Customer Sample Ref.	TP05	TP08	TP09	TP10	TP11	TP04 1.3M
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% 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								
1-4*\$@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m)						
Dibromofluoromethane**	%	TM116	0.70	114	114	115	113	102	111
Toluene-d8**	%	TM116	0.80	95.8	96	99.3	81.9	86	97.8
4-Bromofluorobenzene**	%	TM116	0.00	85.9	83.5	93.5	71.9	77.9	86
Dichlorodifluoromethane	<6 µg/kg	TM116	Soil/Solid (S)	<120	<120	<120	<6	<6	<120
			09/11/2020	M	#	#	M	#	M
Chloromethane	<7 µg/kg	TM116	Soil/Solid (S)	<140	<140	<140	<7	<7	<140
			09/11/2020	#	#	#	#	#	#
Vinyl Chloride	<6 µg/kg	TM116	0.00	<120	<120	<120	<6	<6	<120
			Soil/Solid (S)	M	#	#	M	#	M
Bromomethane	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
Chloroethane	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
Trichlorofluoromethane	<6 µg/kg	TM116	0.10	<120	<120	<120	<6	<6	<120
			Soil/Solid (S)	M	#	#	M	#	M
1,1-Dichloroethene	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	#	#	#	#	#	#
Carbon Disulphide	<7 µg/kg	TM116	0.10	<140	<140	<140	15.2	17.6	<140
			Soil/Solid (S)	M	#	#	M	#	M
Dichloromethane	<10 µg/kg	TM116	0.10	<200	<200	<200	13.8	<10	<200
			Soil/Solid (S)	#	#	#	#	#	#
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
trans-1,2-Dichloroethene	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
1,1-Dichloroethane	<8 µg/kg	TM116	0.10	<160	<160	<160	<8	<8	<160
			Soil/Solid (S)	M	#	#	M	#	M
cis-1,2-Dichloroethene	<6 µg/kg	TM116	0.10	<120	<120	<120	<6	<6	<120
			Soil/Solid (S)	M	#	#	M	#	M
2,2-Dichloropropane	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
Bromochloromethane	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
Chloroform	<8 µg/kg	TM116	0.10	<160	<160	<160	<8	<8	<160
			Soil/Solid (S)	M	#	#	M	#	M
1,1,1-Trichloroethane	<7 µg/kg	TM116	0.10	<140	<140	<140	<7	<7	<140
			Soil/Solid (S)	M	#	#	M	#	M
1,1-Dichloropropene	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
Carbontetrachloride	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
1,2-Dichloroethane	<5 µg/kg	TM116	0.10	<100	<100	<100	<5	<5	<100
			Soil/Solid (S)	M	#	#	M	#	M
Benzene	<9 µg/kg	TM116	0.10	<180	<180	<180	<9	<9	<180
			Soil/Solid (S)	M	#	#	M	#	M
Trichloroethene	<9 µg/kg	TM116	0.10	<180	<180	<180	<9	<9	<180
			Soil/Solid (S)	#	#	#	#	#	#
1,2-Dichloropropane	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
Dibromomethane	<9 µg/kg	TM116	0.10	<180	<180	<180	<9	<9	<180
			Soil/Solid (S)	M	#	#	M	#	M
Bromodichloromethane	<7 µg/kg	TM116	0.10	<140	<140	<140	<7	<7	<140
			Soil/Solid (S)	M	#	#	M	#	M
cis-1,3-Dichloropropene	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
Toluene	<7 µg/kg	TM116	0.10	<140	<140	<140	<7	<7	<140
			Soil/Solid (S)	M	#	#	M	#	M
trans-1,3-Dichloropropene	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
1,1,2-Trichloroethane	<10 µg/kg	TM116	0.10	<200	<200	<200	<10	<10	<200
			Soil/Solid (S)	M	#	#	M	#	M
1,3-Dichloropropane	<7 µg/kg	TM116	0.10	<140	<140	<140	<7	<7	<140
			Soil/Solid (S)	M	#	#	M	#	M







# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

**VOC MS (S)**

Results Legend		Customer Sample Ref.	TP04 1.8M			
# ISO17025 accredited.		Depth (m)	1.80			
M mCERTS accredited.		Sample Type	Soil/Solid (S)			
aq Aqueous / settled sample.		Date Sampled	09/11/2020			
diss.filt Dissolved / filtered sample.		Sample Time				
tot.unfilt Total / unfiltered sample.		Date Received	12/11/2020			
* Subcontracted - refer to subcontractor report for accreditation status.		SDG Ref	201112-94			
** % 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)	23229449			
(F) Trigger breach confirmed		AGS Reference				
1-4*@\$ Sample deviation (see appendix)						
Component	LOD/Units	Method				
Dibromofluoromethane**	%	TM116	105			
Toluene-d8**	%	TM116	95.7			
4-Bromofluorobenzene**	%	TM116	86.5			
Dichlorodifluoromethane	<6 µg/kg	TM116	<6	#		
Chloromethane	<7 µg/kg	TM116	<7	#		
Vinyl Chloride	<6 µg/kg	TM116	<6	#		
Bromomethane	<10 µg/kg	TM116	<10	#		
Chloroethane	<10 µg/kg	TM116	<10	#		
Trichlorofluoromethane	<6 µg/kg	TM116	<6	#		
1,1-Dichloroethene	<10 µg/kg	TM116	<10	#		
Carbon Disulphide	<7 µg/kg	TM116	<7	#		
Dichloromethane	<10 µg/kg	TM116	<10	#		
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10	#		
trans-1,2-Dichloroethene	<10 µg/kg	TM116	<10	#		
1,1-Dichloroethane	<8 µg/kg	TM116	<8	#		
cis-1,2-Dichloroethene	<6 µg/kg	TM116	<6	#		
2,2-Dichloropropane	<10 µg/kg	TM116	<10	#		
Bromochloromethane	<10 µg/kg	TM116	<10	#		
Chloroform	<8 µg/kg	TM116	<8	#		
1,1,1-Trichloroethane	<7 µg/kg	TM116	<7	#		
1,1-Dichloropropene	<10 µg/kg	TM116	<10	#		
Carbontetrachloride	<10 µg/kg	TM116	<10	#		
1,2-Dichloroethane	<5 µg/kg	TM116	<5	#		
Benzene	<9 µg/kg	TM116	<9	#		
Trichloroethene	<9 µg/kg	TM116	<9	#		
1,2-Dichloropropane	<10 µg/kg	TM116	<10	#		
Dibromomethane	<9 µg/kg	TM116	<9	#		
Bromodichloromethane	<7 µg/kg	TM116	<7	#		
cis-1,3-Dichloropropene	<10 µg/kg	TM116	<10	#		
Toluene	<7 µg/kg	TM116	<7	#		
trans-1,3-Dichloropropene	<10 µg/kg	TM116	<10	#		
1,1,2-Trichloroethane	<10 µg/kg	TM116	<10	#		
1,3-Dichloropropane	<7 µg/kg	TM116	<7	#		



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

**VOC MS (S)**

<b>Results Legend</b> # ISO17025 accredited. M mCERTS accredited. sq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % 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 1-4*#@ Sample deviation (see appendix)		<b>Customer Sample Ref.</b>  Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	TP04 1.8M  1.80 Soil/Solid (S) 09/11/2020 . 12/11/2020 201112-94 23229449				
Component	LOD/Units	Method					
Tetrachloroethene	<5 µg/kg	TM116	<5	#			
Dibromochloromethane	<10 µg/kg	TM116	<10	#			
1,2-Dibromoethane	<10 µg/kg	TM116	<10	#			
Chlorobenzene	<5 µg/kg	TM116	<5	#			
1,1,1,2-Tetrachloroethane	<10 µg/kg	TM116	<10	#			
Ethylbenzene	<4 µg/kg	TM116	<4	#			
p/m-Xylene	<10 µg/kg	TM116	<10	#			
o-Xylene	<10 µg/kg	TM116	<10	#			
Styrene	<10 µg/kg	TM116	<10	#			
Bromoform	<10 µg/kg	TM116	<10	#			
Isopropylbenzene	<5 µg/kg	TM116	<5	#			
1,1,2,2-Tetrachloroethane	<10 µg/kg	TM116	<10	#			
1,2,3-Trichloropropane	<16 µg/kg	TM116	<16	#			
Bromobenzene	<10 µg/kg	TM116	<10	#			
Propylbenzene	<10 µg/kg	TM116	<10	#			
2-Chlorotoluene	<9 µg/kg	TM116	<9	#			
1,3,5-Trimethylbenzene	<8 µg/kg	TM116	<8	#			
4-Chlorotoluene	<10 µg/kg	TM116	<10	#			
tert-Butylbenzene	<14 µg/kg	TM116	<14	#			
1,2,4-Trimethylbenzene	<9 µg/kg	TM116	87.8	#			
sec-Butylbenzene	<10 µg/kg	TM116	<10	#			
4-Isopropyltoluene	<10 µg/kg	TM116	<10	#			
1,3-Dichlorobenzene	<8 µg/kg	TM116	<8	#			
1,4-Dichlorobenzene	<5 µg/kg	TM116	<5	#			
n-Butylbenzene	<11 µg/kg	TM116	<11	#			
1,2-Dichlorobenzene	<10 µg/kg	TM116	<10	#			
1,2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14	#			
Tert-amyl methyl ether	<10 µg/kg	TM116	<10	#			
1,2,4-Trichlorobenzene	<20 µg/kg	TM116	<20	#			
Hexachlorobutadiene	<20 µg/kg	TM116	<20	#			
Naphthalene	<13 µg/kg	TM116	<13	#			
1,2,3-Trichlorobenzene	<20 µg/kg	TM116	<20	#			
VOC TIC		TM116	Not Detected				





# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

## Asbestos Identification - Solid Samples

### Results Legend

- # ISO17025 accredited.
- M mCERTS accredited.
- \* Subcontracted test.
- (F) Trigger breach confirmed
- 1-5&\*§@ Sample deviation (see appendix)

Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre	
Cust. Sample Ref. TP05 Depth (m) 0.70 Sample Type SOLID Date Sampled 09/11/2020 00:00:00 Date Received 12/11/2020 09:15:00 SDG 201112-94 Original Sample 23229450 Method Number TM048	19/11/20	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. TP08 Depth (m) 0.80 Sample Type SOLID Date Sampled 09/11/2020 00:00:00 Date Received 12/11/2020 09:15:00 SDG 201112-94 Original Sample 23229451 Method Number TM048	18/11/2020	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. TP09 Depth (m) 0.00 Sample Type SOLID Date Sampled 09/11/2020 00:00:00 Date Received 12/11/2020 09:15:00 SDG 201112-94 Original Sample 23229452 Method Number TM048	18/11/2020	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. TP10 Depth (m) 1.10 Sample Type SOLID Date Sampled 09/11/2020 00:00:00 Date Received 12/11/2020 09:15:00 SDG 201112-94 Original Sample 23229453 Method Number TM048	19/11/2020	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. TP11 Depth (m) 1.80 Sample Type SOLID Date Sampled 09/11/2020 00:00:00 Date Received 12/11/2020 09:15:00 SDG 201112-94 Original Sample 23229454 Method Number TM048	18/11/2020	Barbara UrbaneK-Walsh	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. TP04 1.3M Depth (m) 1.30 Sample Type SOLID Date Sampled 09/11/2020 00:00:00 Date Received 12/11/2020 09:15:00 SDG 201112-94 Original Sample 23229448 Method Number TM048	19/11/20	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. TP04 1.8M Depth (m) 1.80 Sample Type SOLID Date Sampled 09/11/2020 00:00:00 Date Received 12/11/2020 09:15:00 SDG 201112-94 Original Sample 23229449 Method Number TM048	18/11/2020	Paul Poynton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 201112-94	<b>Client Reference:</b> IBRI266	<b>Report Number:</b> 576544
<b>Location:</b> Dungloe	<b>Order Number:</b> 240687404	<b>Superseded Report:</b>

## CEN 10:1 SINGLE STAGE LEACHATE TEST

### WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

<b>Client Reference</b>	Dungloe	<b>Site Location</b>	Dungloe
<b>Mass Sample taken (kg)</b>	0.148	<b>Natural Moisture Content (%)</b>	62.8
<b>Mass of dry sample (kg)</b>	0.090	<b>Dry Matter Content (%)</b>	61.4
<b>Particle Size &lt;4mm</b>	>95%		

<b>Case</b>	
<b>SDG</b>	201112-94
<b>Lab Sample Number(s)</b>	23229451
<b>Sampled Date</b>	09-Nov-2020
<b>Customer Sample Ref.</b>	TP08
<b>Depth (m)</b>	0.80

#### 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	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	21.3
Loss on Ignition (%)	35.3
Sum of BTEX (mg/kg)	<0.8
Sum of 7 PCBs (mg/kg)	<0.105
Mineral Oil (mg/kg)	748
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	6.83
ANC to pH 6 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	0.11

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 10:1 eluate (mg/l)		A <sub>2</sub> 10:1 conc <sup>n</sup> leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection	3	5	6
Arsenic	0.00266	<0.0005	0.0266	<0.005	0.5	2	25
Barium	0.0525	<0.0002	0.525	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00278	<0.0003	0.0278	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0222	<0.003	0.222	<0.03	0.5	10	30
Nickel	0.00451	<0.0004	0.0451	<0.004	0.4	10	40
Lead	0.00114	<0.0002	0.0114	<0.002	0.5	10	50
Antimony	0.00168	<0.001	0.0168	<0.01	0.06	0.7	5
Selenium	0.00142	<0.001	0.0142	<0.01	0.1	0.5	7
Zinc	0.00918	<0.001	0.0918	<0.01	4	50	200
Chloride	9.4	<2	94	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	267	<2	2670	<20	1000	20000	50000
Total Dissolved Solids	535	<5	5350	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	15	<3	150	<30	500	800	1000

### Leach Test Information

<b>Date Prepared</b>	14-Nov-2020
<b>pH (pH Units)</b>	8.31
<b>Conductivity (µS/cm)</b>	741.00
<b>Temperature (°C)</b>	18.40
<b>Volume Leachant (Litres)</b>	0.842

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable  
 Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation  
 Mcerts Certification does not apply to leachates  
 20/11/2020 16:13:52



# CERTIFICATE OF ANALYSIS

Validated

SDG: 201112-94	Client Reference: IBRI266	Report Number: 576544	
Location: Dungloe	Order Number: 240687404	Superseded Report:	

## CEN 10:1 SINGLE STAGE LEACHATE TEST

### WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	Site Location	Dungloe
Mass Sample taken (kg)	Natural Moisture Content (%)	11.6
Mass of dry sample (kg)	Dry Matter Content (%)	89.6
Particle Size <4mm		>95%

<b>Case</b>	
SDG	201112-94
Lab Sample Number(s)	23229453
Sampled Date	09-Nov-2020
Customer Sample Ref.	TP10
Depth (m)	1.10

#### 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	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	2.48
Loss on Ignition (%)	7.02
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	321
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	7.83
ANC to pH 6 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	0.0859

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 10:1 eluate (mg/l)		A <sub>2</sub> 10:1 conc <sup>n</sup> leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection	Inert	Stable	Hazardous
Arsenic	0.00107	<0.0005	0.0107	<0.005	0.5	2	25
Barium	0.00281	<0.0002	0.0281	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00151	<0.0003	0.0151	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00648	<0.003	0.0648	<0.03	0.5	10	30
Nickel	0.00118	<0.0004	0.0118	<0.004	0.4	10	40
Lead	0.0003	<0.0002	0.003	<0.002	0.5	10	50
Antimony	0.00187	<0.001	0.0187	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00249	<0.001	0.0249	<0.01	4	50	200
Chloride	2.2	<2	22	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	44.7	<2	447	<20	1000	20000	50000
Total Dissolved Solids	201	<5	2010	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	8.85	<3	88.5	<30	500	800	1000

### Leach Test Information

Date Prepared	13-Nov-2020
pH (pH Units)	8.28
Conductivity (µS/cm)	264.00
Temperature (°C)	20.00
Volume Leachant (Litres)	0.890

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable  
 Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation  
 Mcerts Certification does not apply to leachates  
 20/11/2020 16:13:52



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 201112-94	<b>Client Reference:</b> IBRI266	<b>Report Number:</b> 576544	
<b>Location:</b> Dungloe	<b>Order Number:</b> 240687404	<b>Superseded Report:</b>	

## CEN 10:1 SINGLE STAGE LEACHATE TEST

### WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

<b>Client Reference</b>	Dungloe	<b>Site Location</b>	Dungloe
<b>Mass Sample taken (kg)</b>	0.110	<b>Natural Moisture Content (%)</b>	21.3
<b>Mass of dry sample (kg)</b>	0.090	<b>Dry Matter Content (%)</b>	82.5
<b>Particle Size &lt;4mm</b>	>95%		

<b>Case</b>	
<b>SDG</b>	201112-94
<b>Lab Sample Number(s)</b>	23229454
<b>Sampled Date</b>	09-Nov-2020
<b>Customer Sample Ref.</b>	TP11
<b>Depth (m)</b>	1.80

#### 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	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	3.14
Loss on Ignition (%)	8.88
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	109
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	7.42
ANC to pH 6 (mol/kg)	0.0412
ANC to pH 4 (mol/kg)	0.0813

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 10:1 eluate (mg/l)		A <sub>2</sub> 10:1 conc <sup>n</sup> leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Arsenic	0.000748	<0.0005	0.00748	<0.005	0.5	2	25
Barium	0.0157	<0.0002	0.157	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00471	<0.0003	0.0471	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00846	<0.003	0.0846	<0.03	0.5	10	30
Nickel	0.00143	<0.0004	0.0143	<0.004	0.4	10	40
Lead	0.00101	<0.0002	0.0101	<0.002	0.5	10	50
Antimony	0.00127	<0.001	0.0127	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0112	<0.001	0.112	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	36	<2	360	<20	1000	20000	50000
Total Dissolved Solids	192	<5	1920	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	7.75	<3	77.5	<30	500	800	1000

### Leach Test Information

Date Prepared	14-Nov-2020
pH (pH Units)	8.14
Conductivity (µS/cm)	256.00
Temperature (°C)	19.70
Volume Leachant (Litres)	0.880

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable  
 Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation  
 Mcerts Certification does not apply to leachates  
 20/11/2020 16:13:52



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94      **Client Reference:** IBRI266      **Report Number:** 576544  
**Location:** Dungloe      **Order Number:** 240687404      **Superseded Report:**

## Notification of NDPs (No determination possible)

Date Received : 12/11/2020 10:11:31

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
23229449	TP04 1.8M	1.80	Chromium III	Sample cannot be filtered
23229449	TP04 1.8M	1.80	Hexavalent Chromium (s)	Sample cannot be filtered
23229449	TP04 1.8M	1.80	Phenols by HPLC (S)	Sample cannot be filtered
23229449	TP04 1.8M	1.80	NO3, NO2 and TON by KONE (s)	Sample cannot be filtered
23229449	TP04 1.8M	1.80	Anions by Kone (soil)	Sample cannot be filtered
23229452	TP09	0.00	NO3, NO2 and TON by KONE (s)	Sample cannot be filtered
23229452	TP09	0.00	Anions by Kone (soil)	Sample cannot be filtered



# CERTIFICATE OF ANALYSIS

Validated

SDG: 201112-94  
Location: Dungloe

Client Reference: IBRI266  
Order Number: 240687404

Report Number: 576544  
Superseded Report:

## Table of Results - Appendix

Method No	Reference	Description
PM023	Leaching test method for the Assessment of Contaminated Land: Interim NRA Guidance. National Rivers Authority R & D note 301. (1994).	Leaching Procedure for NRA Leachates
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
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) 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
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
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
TM136	Method 17.10, Second Site property, March 2003	Determination of Sulphur by HPLC
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
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
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
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
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
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
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
TM331		Low Level Hexavalent Chromium
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 201112-94  
**Location:** Dungloe

**Client Reference:** IBRI266  
**Order Number:** 240687404

**Report Number:** 576544  
**Superseded Report:**

## Test Completion Dates

Lab Sample No(s)	23229450	23229451	23229452	23229453	23229454	23229448	23229449
Customer Sample Ref.	TP05	TP08	TP09	TP10	TP11	TP04 1.3M	TP04 1.8M
AGS Ref.							
Depth	0.70	0.80	0.00	1.10	1.80	1.30	1.80
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)

ANC at pH4 and ANC at pH 6		17-Nov-2020		16-Nov-2020	17-Nov-2020		
Anions by Kone (soil)	19-Nov-2020	19-Nov-2020		16-Nov-2020	19-Nov-2020	19-Nov-2020	
Anions by Kone (w)	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	19-Nov-2020
Asbestos ID in Solid Samples	19-Nov-2020	18-Nov-2020	18-Nov-2020	19-Nov-2020	18-Nov-2020	19-Nov-2020	18-Nov-2020
CEN 10:1 Leachate (1 Stage)		14-Nov-2020		14-Nov-2020	14-Nov-2020		
CEN Readings		15-Nov-2020		15-Nov-2020	15-Nov-2020		
Chromium III	18-Nov-2020	20-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	
Coronene	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020
Cyanide Comp/Free/Total/Thiocyanate	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020
Dissolved Metals by ICP-MS	19-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020
Dissolved Organic/Inorganic Carbon		17-Nov-2020		17-Nov-2020	17-Nov-2020		
Easily Liberated Sulphide	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020
Elemental Sulphur	19-Nov-2020	19-Nov-2020	20-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020
EPH by GCxGC-FID		17-Nov-2020		17-Nov-2020	17-Nov-2020		
EPH CWG (Aliphatic) Filtered GC (W)	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020
EPH CWG (Aromatic) Filtered GC (W)	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020
EPH CWG GC (S)	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020
Fluoride		16-Nov-2020		16-Nov-2020	16-Nov-2020		
GRO by GC-FID (S)	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	16-Nov-2020	17-Nov-2020	17-Nov-2020
GRO by GC-FID (W)	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020
Hexavalent Chromium (s)	18-Nov-2020	17-Nov-2020	17-Nov-2020	18-Nov-2020	18-Nov-2020	17-Nov-2020	
Loss on Ignition in soils		19-Nov-2020		16-Nov-2020	19-Nov-2020		
Low Level Hexavalent Chromium (w)	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020
Mercury Dissolved	19-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020
Metals in solid samples by OES	19-Nov-2020	20-Nov-2020	18-Nov-2020	18-Nov-2020	19-Nov-2020	18-Nov-2020	20-Nov-2020
Moisture at 105C		14-Nov-2020		13-Nov-2020	14-Nov-2020		
NO3, NO2 and TON by KONE (s)	19-Nov-2020	19-Nov-2020		17-Nov-2020	19-Nov-2020	19-Nov-2020	
NRA Leachate	14-Nov-2020	14-Nov-2020	14-Nov-2020	14-Nov-2020	14-Nov-2020	14-Nov-2020	14-Nov-2020
PAH 16 & 17 Calc	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020
PAH by GCMS	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020
PAH in waters by GC-MS (diss.filt)	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020
PCBs by GCMS		17-Nov-2020		17-Nov-2020	17-Nov-2020		
pH	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020	16-Nov-2020
pH Value of Filtered Water	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020
Phenols by HPLC (S)	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	
Phenols by HPLC (W)		19-Nov-2020		18-Nov-2020	18-Nov-2020		
Sample description	13-Nov-2020	13-Nov-2020	13-Nov-2020	13-Nov-2020	13-Nov-2020	13-Nov-2020	13-Nov-2020
Semi Volatile Organic Compounds	18-Nov-2020	18-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	18-Nov-2020	18-Nov-2020
Stone count >2.00mm on dry sample	17-Nov-2020	17-Nov-2020	17-Nov-2020	18-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020
Total Dissolved Solids		16-Nov-2020		16-Nov-2020	16-Nov-2020		
Total Organic Carbon	19-Nov-2020	20-Nov-2020	20-Nov-2020	17-Nov-2020	19-Nov-2020	19-Nov-2020	20-Nov-2020
Total Sulphate	19-Nov-2020	19-Nov-2020	19-Nov-2020	16-Nov-2020	19-Nov-2020	19-Nov-2020	19-Nov-2020
TPH CWG Filtered (W)	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020	18-Nov-2020
TPH CWG GC (S)	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020
VOC MS (S)	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020	17-Nov-2020



# CERTIFICATE OF ANALYSIS

<b>SDG:</b> 201112-94	<b>Client Reference:</b> IBRI266	<b>Report Number:</b> 576544
<b>Location:</b> Dungle	<b>Order Number:</b> 240687404	<b>Superseded Report:</b>

## Appendix

## General

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. 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 6 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. ALS reserve the right to charge for samples received and stored but not analysed.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

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

11. 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.

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

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. 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.

15. 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.

16. 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.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

### 18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

### 19. Asbestos

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 (NDP). The quantity of asbestos present is not determined unless specifically requested.

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (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 ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

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

#### 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.

#### Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017)*.

**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.**




## Appendix C Trial Pits Logs



# TRIAL PIT LOG

Trial Pit No.  
**TP01**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177660.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	N- 413204.00		
Location: Dungloe, Co Donegal	Equipment: Mechanical Excavator	Scale: 1:25	
Client: Donegal County Council	Dimensions: m x m	Orientation: °	Logged by: JD

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
				0.30		 Organic PEAT with occasional plastic fragments. Supporting grass vegetation growth. No odour. (PEAT)	
				1.20		 Municipal Solid WASTE including plastic bottles, shrink wrap, glass bottles, cassette tapes, timber/wood offcuts. Slight landfill gas odour. Slight leachate inflow at 0.9m bgl.()	
				1.40		 Brown CLAY with some black staining evident. No gravel/stone content.()	
----- End of trialpit at 1.40 m							

Stability:

Groundwater:

Remarks: Slight inflow of leachate at 0.9m bgl. Slight landfill gas odour at 0.3-1.2m.



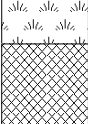
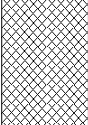




# TRIAL PIT LOG

Trial Pit No.  
**TP03**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177648.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	N- 413215.00		
Location: Dungloe, Co Donegal	Equipment: Mechanical Excavator	Scale: 1:25	
Client: Donegal County Council	Dimensions: m x m	Orientation: °	Logged by: JD

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
0.50 0.50	B PID	ES1 1	Oppm	0.15			PEAT cover with occasional litter (plastic wraps and tin cans). Limited peat cover with scrub vegetation (rushes and brambles) and Himalayan Balsam adjacent to trial pit location. (PEAT)
				0.85			Stone FILL (<250mm diameter crushed compacted rock). No odour. Seepage at 0.5m bgl and 0.8m bgl. (FILL)
End of trialpit at 0.85 m							

Stability:

Groundwater: Slow seepage/ingress at 0.5m bgl. Seepage/ingress at 0.8m bgl.

Remarks: Himalayan Balsam located adjacent to trial pit location. Trial pit terminated due to difficulty in excavation.









# TRIAL PIT LOG

Trial Pit No.  
**TP04**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177662.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	N- 413195.00		
Location: Dungloe, Co Donegal	Equipment: Mechanical Excavator	Scale: 1:25	
Client: Donegal County Council	Dimensions: m x m	Orientation: °	Logged by: JD

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
0.15						 Organic PEAT. Limited peat cover with scrub vegetation (rushes and brambles). No odour. (PEAT)	
1.30	ES	ES1	Oppm			 Municipal Solid WASTE including plastic bags, tyres, concrete blocks, black bags of domestic waste, glass bottles. No distinct strata or soil cover horizons.()	
1.30	PID	1					
1.50						 Organic PEAT, no fibrous matter. Damp. (PEAT)	
1.80	ES	ES2		1.80		 End of trialpit at 1.80 m	

Stability:

Groundwater: No seepages noted.

Remarks:



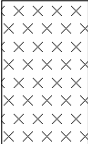




# TRIAL PIT LOG

Trial Pit No.  
**TP05**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177702.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	N- 413184.00		
Location: Dungloe, Co Donegal	Equipment: Mechanical Excavator	Scale: 1:25	
Client: Donegal County Council	Dimensions: m x m	Orientation: °	Logged by: JD

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
0.70	ES	ES1		0.40		 Organic PEAT. Scrub vegetation (grass, rushes and brambles. Suspected Giant Hogweed c.5m north of trial pit). No odour. Dry. (PEAT)	
				0.90		 Municipal Solid WASTE including black plastic bags, shopping bags, clothing and hoses. Slight odour. Dry.(.)	
				1.40		 Dark grey SILT. Strong inflow at 0.9m bgl.(.)	
							End of trialpit at 1.40 m

Stability:

Groundwater: Strong inflow at 0.9m bgl.

Remarks: Suspected Giant Hogweed approximately 5m north of trial pit location.





# TRIAL PIT LOG

Trial Pit No.  
**TP06**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177604.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	N- 413129.00		
Location: Dungloe, Co Donegal	Equipment: Mechanical Excavator	Scale: 1:25	
Client: Donegal County Council	Dimensions: 3.00m x m	Orientation: °	Logged by: JD

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
				1.40			Organic PEAT. Scrub vegetation (rushes and brambles). No odour. (PEAT)
							End of trialpit at 1.40 m

Stability:

Groundwater:

Remarks: Trench on lake slope (3m length).









# TRIAL PIT LOG

Trial Pit No.  
**TP07**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177603.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	N- 413170.00		
Location: Dungloe, Co Donegal	Equipment: Mechanical Excavator	Scale: 1:25	
Client: Donegal County Council	Dimensions: m x m	Orientation: °	Logged by: JD

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
				0.10			Organic PEAT. Limited peat cover with scrub vegetation (brambles). No odour. (PEAT)
				0.60			WASTE, exclusively shredded plastic. Dry.()
				0.90			Municipal Solid WASTE including black plastic bags, glass bottles, plastic bags. Peat present on western face of trial pit. No odour.()
				1.00			Granular single sized stone FILL (16-32mm single sized stone). Substantial inflow at 0.9m bgl. (FILL)
End of trialpit at 1.00 m							

Stability:

Groundwater: Substantial inflow at 0.9m bgl.

Remarks:





# TRIAL PIT LOG

Trial Pit No.  
**TP08**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177603.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	N- 413179.00		
Location: Dungloe, Co Donegal	Equipment: Mechanical Excavator	Scale: 1:25	
Client: Donegal County Council	Dimensions: m x m	Orientation: °	Logged by: JD

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
0.20				0.20			Organic PEAT. Limited peat cover with scrub vegetation (grass and brambles). No odour. (PEAT)
0.30				0.30			Light brown sandy SILT. Dry.()
0.90	ES	ES1	0ppm				Municipal Solid WASTE including timber, clothing, plastic bottles and glass fragments. Strong odour. Slight seepage at 2.0m bgl.()
0.90	PID	1					
				2.10			End of trialpit at 2.10 m

Stability:

Groundwater: Slight seepage at 2.0m bgl.

Remarks: Excavation ceased due to instability; sides falling in.




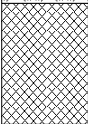





# TRIAL PIT LOG

Trial Pit No.  
**TP10**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177662.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	Co-ordinates: N- 413156.00	Equipment: Mechanical Excavator	Scale: 1:25
Location: Dungloe, Co Donegal	Dimensions: m x m	Orientation: °	Logged by: JD
Client: Donegal County Council			

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
1.10	ES PID	ES1 1	0ppm	0.35			Organic PEAT with small windblown litter fragments (plastic) and logs. No odour. (PEAT)
1.10				0.75		Heavily compacted granular FILL (<300mm crushed angular rock) within sandy SILT matrix. Dry. (FILL)	
				1.80			Municipal Solid WASTE including black plastic bags, clothing, plastic bottles, glass and timber. Occasional C&D waste fragments including insulation panels and timber. Strong odour within horizon. Waste generally saturated, Strong inflow of water at 1.2m bgl and 1.6m bgl.()
							End of trialpit at 1.80 m

Stability:

Groundwater: Strong inflow of water at 1.2m bgl and 1.6m bgl/

Remarks: Excavation ceased due to instability.





# TRIAL PIT LOG

Trial Pit No.  
**TP11**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177697.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	N- 413142.00		
Location: Dungloe, Co Donegal	Equipment: Mechanical Excavator	Scale: 1:25	
Client: Donegal County Council	Dimensions: m x m	Orientation: °	Logged by: JD

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
				0.10			Organic PEAT. Limited peat cover with scrub vegetation. No odour. (PEAT)
				0.45			Light grey SILT and angular GRAVEL (<40mm diameter). No odour. Dry.()
							Municipal Solid WASTE including black plastic bags, silage roll wrap and elements of C&D WASTE including timber offcuts, plastic straps, tarpaulin and empty sand bags. No distinct horizons. Strong odour. Substantial inflow at 1.2 m bgl, strong inflow at 1.9m bgl.()
1.80 1.80	ES PID	ES1 1	1ppm				
				2.80			End of trialpit at 2.80 m

Stability:

Groundwater: Substantial inflow at 1.2m bgl. Strong inflow at 1.9m bgl.

Remarks:





# TRIAL PIT LOG

Trial Pit No.  
**TP12**  
Sheet 1 of 1

Project Name: Donegal Historic Landfills ERA	Co-ordinates: E- 177720.00	Ground Level: m AOD	Date: 09/11/2020
Project No: IBR1266	N- 413095.00		
Location: Dungloe, Co Donegal	Equipment: Mechanical Excavator	Scale: 1:25	
Client: Donegal County Council	Dimensions: m x m	Orientation: °	Logged by: JD

Samples & In Situ Testing				Depth (m)	Level (mAOD)	Legend	Stratum description
Depth (m)	Type	Ref	Results				
				0.40			Organic PEAT - limited peat cover with scrub vegetation (brambles and gorse). No odour.()
				0.50			Light grey gravelly SILT with occasional cobbles. No odour. Dry.()
				0.60			Brown sandy GRAVEL. No odour. Dry.()
							Municipal Solid WASTE including black plastic bags, interspersed with steel panels, rubber belts, domestic refuse, black plastic bags. No distinct horizons. No odour. Water ingress at 1.9m bgl.()
				2.00			End of trialpit at 2.00 m

Stability:

Groundwater: Water ingress at 1.9m bgl.

Remarks:

