Appendix 7.A

Project Opera

Environmental Site Assessment and Preliminary Soil Waste Classification

Project Opera

Limerick City & County Council / Limerick 2030

Project Number: 60533080

16 June 2017

Quality information

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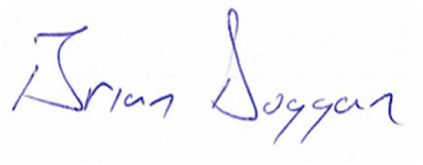		
Brian Duggan Senior Environmental Scientist	Dr. Clare Glanville Associate Director	Dr. Clare Glanville Associate Director

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Prepared for:

Limerick City & County Council / Limerick 2030

Prepared by:

Brian Duggan
Senior Environmental Scientist
T: + 353 1 2933241
E: brian.duggan@aecom.com

AECOM Ireland Limited
4th Floor
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
Co. Dublin
Ireland

T: +353 1 238 3100
aecom.com

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Executive Summary

AECOM Ireland Limited (AECOM) completed this Environmental Site Assessment (ESA) for Limerick City & County Council / Limerick 2030 (the Client) for the Project Opera development site (the site), Limerick City. The site is a brownfield site with a number of historic and more recent commercial and residential buildings (some derelict and some in use).

The Client is proposing to develop and regenerate the site for mixed use development comprising office, retail, culture, and licenced premises uses. As part of the proposed development some of the existing buildings will be demolished while some will be retained.

The objective of the ESA was to assess the potential risks to human health (future site users) and the environment (nearby surface water and underlying groundwater) from soil and groundwater underlying the site and to assess the waste classification of soils which may require excavation and off-site disposal during future redevelopment in order to identify appropriate disposal routes.

AECOM completed a site investigation which included excavation of trial pits; drilling of boreholes; installation of groundwater monitoring wells and subsequent laboratory analysis of soil and groundwater samples in conjunction with a geotechnical site investigation being undertaken by Irish Geotechnical Site investigations Limited (IGSL). During the site investigation there was no evidence of significant contamination present at the site. However, made ground contained some construction waste materials and small volumes of contaminants such as ash. Groundwater was identified during this investigation within shallow soils and made ground.

A risk-based approach was adopted for the assessment of data from the site which involved screening soil and groundwater data against generic acceptance criteria (GAC) considered appropriate for a residential end use (without home-grown produce) and controlled water (groundwater and nearby surface water). The screening showed that:

- Polycyclic Aromatic Hydrocarbon (PAH) compounds in one soil sample and metal concentrations in five soil samples exceeded the GAC protective of human health;
- Metal concentrations in a number of soil leachate samples exceeded the GAC protective of Controlled Water; and
- Groundwater concentrations did not exceed GAC protective of human health or groundwater or surface waters.

Based on the results of the GQRA, the following is concluded:

- A low risk to future site users has been identified from contaminants present in made ground at the site.
- A low risk to groundwater and surface waters has been identified due to leaching of contaminants from soil to groundwater.

. It is recommended that any areas of the development which will not be covered in buildings or hard standing such as landscaped open areas are either capped with an impermeable membrane or covered with a layer of clean imported fill material to a depth of at least 750mm during the redevelopment work thereby reducing the, albeit low, potential risk to future site users from made ground at the site.

A preliminary soil waste classification was undertaken to assess the general nature of the made ground material and natural soil present at the site. This assessment has considered the analytical results from 23 soil samples analysed from this investigation. This soil waste classification was carried out by screening the soil sample results against waste classification criteria and found:

- Ten of the 15 made ground samples have been classified as Inert Category A or Category B (EWC: 17 05 04 Soil & stones);
- Six of the 8 natural clay soil samples at the site have been classified as Inert Category A or Category B (EWC: 17 05 04 Soil & stones);
- Three of 15 made ground and 2 of 8 natural soil samples classified as non-hazardous Category C1 (EWC: 17 05 04 Soil & stones); and
- The remaining 2 made ground samples have been classified as hazardous Category D1 (Soil and stones containing hazardous substances) due to the presence of metals within these samples.

The preliminary waste classification at the site showed that made ground was impacted with a variety of organic and inorganic parameters and as such has been classified as a mixture of Inert, Non-Hazardous and Hazardous with a variety of disposal outlets required for material to be excavated.

1. Introduction

AECOM Ireland Limited (AECOM), is pleased to present this Environmental Site Assessment (ESA) to Limerick City & County Council / Limerick 2030 (the Client), completed for the Project Opera development site, Limerick City, County Limerick.

The Project Opera development site is bounded to the north by Bank Place, to the east by Patrick Street & Rutland Street, to the west by Michael Street and to the south by Ellen Street and hereafter referred to as "the site". The site location is presented in Figure 1 and the indicative site layout is presented in Figure 2.

2. Objective

The objective of this ESA is:

- To assess the potential risks to human health (future site users) and the environment (nearby surface water and underlying groundwater) from potential historical impact which may be present in the soil at the site; and
- To complete a preliminary waste classification of soils at the site in order to identify appropriate disposal routes for these which may require disposal during site redevelopment.

3. Scope of Work

The scope of works undertaken as part of this ESA in order to achieve the above objectives is outlined below:

- Task 1 – Site Investigation;
- Task 2 – Generic Quantitative Risk Assessment (GQRA); and
- Task 3 – Preliminary Soil Classification;
- Task 4 – Remedial Options Appraisal; and
- Task 5 – Reporting.

4. Site Environmental Setting

4.1 Site Description

The site covers an area of approximately 1.62 hectares and is located within a predominantly commercial area of Limerick City Centre on the eastern bank of the River Shannon.

The site consists of a number of residential, commercial and industrial buildings, some of which are currently occupied and some of which are derelict. Many buildings at the site date from the Georgian era and include residential townhouses as well as commercial buildings including shops, merchant's stores and warehouses. In addition to the Georgian era buildings there are a number of more modern warehouse and office buildings at the site.

4.2 Description Proposed Development

It is the understanding of AECOM that the Client is proposing to develop and regenerate the site for mixed use development comprising office, retail, culture, and licenced premises uses. As part of the proposed development some of the existing buildings will be demolished while some will be retained. In addition, a number of new multi-story commercial and residential buildings are proposed for the site.

The development works will comprise:

- The demolition of No's. 6 and 7 Rutland Street; No's 6 and 7/8 Patrick Street; No. 3 Ellen Street, the former Cahill May Roberts building; and warehouse/workspace buildings;
- Refurbishment and modifications of: No's. 4 and 5 Rutland Street, No's 1-5 Patrick Street and No's 4 – 6 Ellen Street, Town Hall (Protected Structure), No's 8-9 Rutland Street, No's 7-9 Ellen Street and modification of the cut stone warehouse Granary (Protected Structure) facing Banks Place and Michael Street;
- Construction of a commercial building comprising 10-13-storeys fronting Bank Place; a 4-6 storey building fronting Rutland Street and proposed public plaza; and a 6-7 storey building fronting Michael Street, all over 1-basement level and may include residential apartments; and

- Development of a public plaza; pedestrian linkages; communal and private open space areas; bicycle parking; vehicular access and 150 car parking spaces at basement level; surface water attenuation tanks, general plant; storage areas and refuse management; signage; diversion of underground services; set-down areas; and all related site development and excavation works above and below ground.

4.3 Adjacent Land Use

Land use adjacent to the site is summarised in the Table 4.1 below.

Table 4.1 Adjacent Land Use

Direction	Land Use
North	The site is bound to the north by Banks Place and Charlotte's Quay (Dublin Rd. R445) and the River Abbey beyond.
South	To the south, along Ellen Street, the site is bound by a number of commercial and residential buildings with the southern extent of a car park in the south-eastern corner.
East	The eastern extent is bounded by Michael Street and comprises of a carpark and predominantly commercial buildings to the north of the street including the Regional Revenue Office and some residential buildings to the south of the street.
West	The western extent is bound by Rutland Street with the Arthurs Quay Shopping Centre beyond with the Hunt Museum at the northern end.

4.4 Site Environmental Setting

A summary of the sites' environmental setting and that of the surrounding area is presented in the Table 4.2 below.

Table 4.2 Site Environmental Setting

Item	Description
Surface of site	The site comprises active and derelict buildings which cover approximately 60% of the site surface. The remainder is predominantly surfaced with weathered concrete or tarmacadam hard standing with and a number of areas comprising of hardcore and building material rubble. A carpark 'Ellen Street Carpark' is located in the southeast corner of the site and has a good quality tarmacadam surface.
Topography	The mean site level at the boundary of the site is in the region of 5 m ordnance datum (OD) but there is a general slope down from street level to the centre of the site which has a ground level elevation of circa 3.3m OD. Ground elevations at street level outside the site range from circa 6.5m OD in the northwest corner of the site to approximately 4.5 OD in the northeast corner and from 5.5m OD in the southwest corner of the site to approximately 4.6m OD in the southeast corner.
Geology	The Teagasc soil map shows that the site is underlain by 'made ground' underlain by marine/estuarine silts and clays. The bedrock underlying this is described by the GSI website as Dinantian Pure Bedded Limestones. The Geological Survey of Ireland (GSI) website also includes information on geotechnical investigation boreholes drilled on an adjacent site (Arthurs Quay) site. Boreholes were drilled to a maximum depth of 16 meters below ground level (m bgl). Borehole logs indicate made ground overlying silty sands, and clay, boulders and gravel to a maximum depth of 11m bgl. Bedrock was encountered at a minimum depth of 7.5m bgl.

Hydrogeology and Aquifer Classification	The bedrock aquifer underlying the site is classified by the GSI as a "Locally Important Aquifer – bedrock which is Generally Moderately Productive". The assigned ground water vulnerability is listed as between high and moderate on the GSI Groundwater website. The site is not located within a groundwater supply source protection zone. The regional groundwater flow direction is expected to be to the west, towards the River Shannon which is located beyond the western boundary of the site. A search of the GSI well database did not identify any wells within 1km of the site. However, it is noted that there is currently no requirement to register wells with the GSI, so unrecorded wells may be present in the area.
Surface Water and Flood Risk	The closest surface water is the Abbey River which is located approximately 40m to the north of the site and is tidal at this point. The Abbey River flows westwards and joins the River Shannon northwest of the site at the opposite side of the Hunt Museum to the northwest of the site. The River Shannon is located approximately 180m west of the site and flows in a southerly direction and is tidal at this point. There is no indicated water quality monitoring station on the River Shannon or Abbey River within 1km of the site for which data is available, however, on the EPA website the River Shannon and Abbey River are classified as transitional water bodies and their status is rated as 'moderate'. The Office of Public Works (OPW) flood map for the area indicates that a number of flood events in the Limerick City region particularly during 2009 and 2010. A number of factors including a combination of heavy rainfall and subsequent surface water runoff into the river. A peak in the water discharge from Parteen Weir was also a factor in the flooding during November and December 2009. The Shannon Area Preliminary Flood Risk Maps (CEFRAM) show portions of the site in areas at risk from fluvial 100 year flood events and coastal 200 year flood events.
Radon	As detailed in radon maps on the EPA's Envision online map viewer prepared by the Radiological Protection Institute of Ireland (RPII), the site is located in an area with between 1% and 5% of properties in a 10km grid square that are estimated to be above the 200Bq/m^3 reference level for radon. Grid squares in which the predicted percentage of properties is 10% or greater are classed as High Radon Areas. Under current building regulations, any building constructed on or after 1 July 1998 should incorporate radon protection measures.
Permit Status	According to the EPA website there are no Integrated Pollution and Control (IPC) or Industrial Emission (IE) facilities within a 2km radius of the site.
Other	There are no other environmentally sensitive areas within 1km of the site.
Sensitive Receptors	Sensitive receptors identified within 1km of the site include the following: • The Abbey River located 40m north of the site and the River Shannon located 180m west of the site; and • A number of residential dwellings within a 200m radius of the site consisting mainly of apartments and townhouses.
Environmental Sensitivity	The environmental sensitivity of the site is **Moderate to High** given the distance to the River Shannon and Abbey River and potential human health receptors including current residents at the site.

4.5 Site History and Potential for Historic Contamination

A summary of the sites history and the potential for significant historic contamination associated with on-site and off-site activities is outlined in the Table 4.3 below.

Table 4.3 Site History and Potential for Historic Contamination

History	Description
History of Site	A document provided to AECOM concerning the background and history to the site indicates that the site and surrounding area of Limerick were extensively redeveloped from the former medieval layout during that mid-18th Century. In 1769 the streets and squares that now characterise this area of the city centre were mapped out and Rutland Street was the commercial and merchant heart of Limerick.

History of Site	Online historical maps dating from 1837 to 1842 (6-inch to 1 mile series) show that the site has been developed. The general layout of the site itself and that of the surroundings streetscape is similar to todays but Michael Street, to the west of the site, has a slightly different layout and connection between Bank Place and Ellen Street is not complete. There is no description of buildings on the site but given the similarity between these marked on the map and existing buildings it is assumed that they are predominantly commercial in nature with some residential properties. Online historical maps dating 1888 to 1913 (25 inch to 1 mile series) and from 1936-1937 show that the layout of the site and surrounding area is broadly unchanged from the 1837 to 1842 mapping. Aerial photography dating from between 1995 and 2005 show the site in a layout very similar to its current layout with the existing office and warehouse buildings in their current layout. A former warehouse building, on the corner of Michael Street and Ellen Street, was demolished post 2005 and this area of the site is now in use as a the Ellen Street carpark.
Potential On-site Sources of Contamination	The site walkover identified a former fuel pump in the centre of the site which may have been connected to an above ground storage tank. Former uses of the site are thought to include: • A print work; and • An automobile garage in parts of the site. Historical maps examined as part of this desktop study did not identify any potentially significant on-site sources of contamination. However, similar to many other city centre brownfield sites a number of general contaminative sources exist: • Former coal cellars, yards, boilers and cellars; • Former use for commercial and warehousing; • Potential oil tanks and fuel lines; • Potential made ground underlying the site; and • Asbestos used in construction of buildings. Overall, the potential for significant ground contamination from on-site sources is considered **Low** / **Moderate.**
Potential Off-Site Sources of Contamination	Historical maps examined as part of this desktop did not identify any potentially significant off-site sources of contamination. However, similar to those detailed in relation to on-site sources a number of general contaminative sources exist as it is a city centre brownfield area. Overall, the potential for significant ground contamination from off-site sources is considered **Low** / **Moderate.**
Potential for Contamination	Based on the known uses of the site and surrounding area, the potential for significant ground contamination is considered to be **Low** / **Moderate.**

5. Preliminary Conceptual Site Model

A Conceptual Site Model (CSM) has been developed and is described in this section, identifying contaminant sources, contaminant migration pathways and potential receptors for the site. The CSM was developed based on desktop study information and on-site observations during a site walkover.

5.1 Pollutant Linkage Concept

In the context of land contamination, there are three essential elements to any risk:

- A **source** – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of controlled waters;
- A **receptor** – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body; and
- A **pathway** – a route or means by which a receptor can be exposed to, or affected by, a contaminant source.

Each of these elements can exist independently, but they create a risk only where they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway. This kind of linked combination of

contaminant–pathway–receptor is described as a 'pollutant linkage'. The CSM was developed to describe viable source-pathway-receptor pollutant linkages for the site.

The desktop study was used to conceptualise the potential contaminant source areas as well as the pathways and receptors.

5.2 Potential Sources

The findings of the desktop study indicate that there are a number of potential sources with associated Potential Contaminants of Concern (PCOCs) at the site as outlined in Table 5.1 below.

Table 5.1 Summary of potentially significant sources of contamination

Potential Source	Contaminants of Potential Concern	Source Area
Reduced quality made ground and overburden potentially contaminated with a variety of organic and inorganic contaminants.	• Hydrocarbons • Polycyclic aromatic hydrocarbons • Volatile Organic Carbon • Semi Volatile Organic Carbons • Metals • Polychlorinated biphenols • Asbestos	Historical maps did not identify potentially significant sources of on-site or off-site contamination; however, similar to many other city centre brownfield sites a number of general contaminative sources exist In additional former industrial and commercial uses of parts of the site are thought to including use as a print works and potentially as an automobile garage with a former fuel pump and fuel storage tank at centre of site.

5.3 Potential Receptors

Human Health

AECOM understand that the site is to be redeveloped for predominantly commercial use with some medium and high density residential units. The on-site human health receptors are considered to be residential (without home-grown produce) and commercial users.

Off-site receptors are also considered to be residential (without home-grown produce), due to the proximity of residential housing and apartments to the east and west of the site and commercial users of neighbouring buildings.

It is expected that risks to off-site residents and workers and construction workers during construction works at the site will be suitably mitigated with the implementation of robust environmental control measures (i.e. dust suppression etc.) and the use of appropriate personal protective equipment by construction workers. Further comment on the risks to construction personnel and off-site residents during the construction phase is beyond the scope of this report.

As the site is located in an urban area serviced by mains water supply and adjacent to tidal water bodies it is considered unlikely that there are any potable groundwater abstractions in the immediate vicinity of the site. A search of the GSI well database did not identify any wells within 1km of the site.

Controlled Waters

The following potential controlled waters receptors were identified given the environmental setting of the site:

Table 5.2 Controlled Water Receptors

Water Environment Receptors	Present (Y/N)	Potable Supply (Y/N)	Description/Comments
Groundwater abstraction within 500m of the site.	No	No	There are no known groundwater abstractions within 500m of the site. The site and surrounding area is serviced by mains water supply.
Surface water body within 500m of the site in direct hydraulic connection with groundwater from the site.	Yes	No	Abbey River located approximately 40m north of the site and is tidal at this point
		No	River Shannon is located approximately 180m west of the site and is tidal at this point.
Groundwater in bedrock beneath the site.	Yes	Possible	The bedrock aquifer underlying the site is classified by the GSI as a ”Locally Important Aquifer”, that is “moderately productive only in local zones”.
Groundwater in superficial deposits beneath the site.	Yes	Unlikely	The superficial deposits beneath the site consist of made ground and marine/estuarine silts and clays and are not considered to be an aquifer.

5.4 Potential Pathways

Based on the proposed development design there are therefore considered to be a number of potential pathways for future site users. The potential pathways to human health and controlled waters receptors which are considered viable are outlined in Table 5.3 below.

Table 5.3 Potential Pathways

Receptor	Pathway
Pathways to human health receptors in a medium and high density residential scenario.	• Soil and dust ingestion from near surface soils • Dermal contact with near surface soils • Inhalation of fugitive dust from near surface soils • Vapours - migration of vapours through made ground to above ground buildings • Permeation - migration of hydrocarbon substances through plastic potable water supply pipes
Pathways to controlled waters receptors.	• Leaching of contaminants from soil into perched groundwater followed by vertical migration • Potential lateral migration of impacted groundwater • Horizontal groundwater migration to nearby surface waters

5.5 Summary of Viable SPR Linkages

The elements of the CSM that form viable source-pathway-receptor (SPR) linkages are summarised in Table 5.4 below:

Table 5.4 Summary of Viable SPR Linkages

RECEPTOR	SOURCE	PATHWAY									
		1) Soil and dust ingestion	2) Consumption of vegetables	3) Dermal contact	4) Inhalation of fugitive dust	5) Ingestion of groundwater	6) Inhalation of vapours	7) Leaching from unsaturated zone	8) Vertical groundwater migration	9) Horizontal groundwater migration	10) Permeation of hydrocarbons through water supply pipes
Commercial Site Users	Soils			✓	✓		✓				✓
	Groundwater						✓				
Residential site users (without plant uptake)	Soils	✓		✓	✓		✓				✓
	Groundwater						✓				
Groundwater	Soils							✓			
	Groundwater								✓	✓	
Surface Water	Soils							✓			
	Groundwater									✓	

✓ = Pathway present Blank = no pathway

6. Intrusive Investigation Methodology

The current intrusive investigation work completed as part of this assessment was carried out by AECOM between 08 and 11 May 2017. The site investigation work was undertaken in conjunction with a geotechnical site investigation being undertaken by Irish Geotechnical Site Investigations Limited (IGSL).

6.1 Health and Safety

An AECOM 'Health Safety and Environmental Plan' (HSEP) was completed prior to field works being undertaken at the site. The HSEP described the health, safety and environmental requirements for AECOM project personnel and their contractors' personnel involved in the environmental site investigation works. The HSEP included key project responsibilities, standard safe working practises, general physical and chemical hazards, a detailed hazard risk assessment, requirements for personal protective equipment (PPE), environmental management, decontamination procedures, waste management, management of change and emergency response plans. The HSEP was maintained on site at all times during the investigation, and acted as a live document. All AECOM staff were inducted into the HSEP by AECOM and were required to sign the HSEP to confirm their understanding of the hazards and mitigation measures.

6.2 Trial Pitting

Four trial pits (TP2 - TP5) were advanced across the site in order to investigate ground conditions beneath the site and to obtain soil samples to complete a GQRA and preliminary soil waste classification. One additional trial pits (TP6) was attempted but both met refusal on a concrete slab at shallow depth while access was unavailable to two proposed locations (TP1 and TP7).

The AECOM field scientist was responsible for logging soils, including a description of the subsurface soils and an inspection for visual evidence of contamination. Soil samples were collected at each new stratum encountered until target depths were achieved.

Trial pit borehole locations are presented in Figure 3 while trial pit logs are presented in Appendix B.

6.3 Window Sample Borehole Drilling

Seven window sample boreholes (WS01 to WS05 and WS07 to WS08) were advanced across the site by IGSL Ltd using a tracked window sampling drilling rig. Boreholes were completed to a maximum depth of 4.0m bgl.

The AECOM field scientist was responsible for logging soils, including a description of the subsurface soils and an inspection for visual evidence of contamination. Soil samples were collected at each new stratum encountered until target depths were achieved.

Window sample borehole locations are presented in Figure 3 while logs are presented in Appendix C.

6.4 Monitoring Well Installation

Monitoring wells were installed in six boreholes (BH01 to BH05 and BH08) which were advanced across the site by IGSL using a Dando 2000 cable percussion drilling rig. These boreholes were completed to a maximum depth of 4.0m bgl.

After completion of drilling, groundwater and ground gas monitoring wells were installed into all boreholes with a screened section from 1.0m bgl to the base of the borehole. Wells comprised a 50 mm diameter high-density polyethylene (HDPE) standpipe. The screened section of the wells were surrounded by a washed gravel filter pack, and a bentonite seal was placed above the screened section in order to prevent the creation of a downward pathway for potential surface-derived contamination.

Groundwater wells were finished at surface using flush metal covers set in a concrete pad to protect the well. Monitoring well locations are presented in Figure 3 while well installation logs are presented in Appendix D.

6.5 Soil Sampling and Analysis

Soil samples were collected from each trial pit and window sample borehole. Depths of sampling were informed by field observations and also to provide coverage of material across the site at multiple depths; samples were obtained from the made ground and from the underlying natural strata.

Standard environmental sampling techniques were adopted to minimise the risk of cross contamination between sampling locations. Soil samples selected for analyses were placed into laboratory supplied sample jars. The AECOM field scientist wore single-use disposable nitrile gloves, which were changed at each sampling location.

Samples were stored in a chilled cool box and dispatched to Scientific Analysis Laboratories Ltd, SAL based in Manchester, UK accompanied with an appropriate chain of custody and scheduled for analysis.

A total of 44 soil samples were collected from boreholes and trial pits at the site and 23 of these were submitted for laboratory analysis in order to allow environmental assessment of the site and to provide a classification of soils to be excavated from the site. Soil samples were scheduled for the following analysis:

Table 6.1 Soil Laboratory Analysis

Soil Analysis	No. of Samples
Speciated total petroleum hydrocarbons (TPH)	23
Benzene, Toluene, Ethylbenzene and Xylene (BTEX) compounds	23
Speciated 16 polycyclic aromatic hydrocarbons (PAHs)	23
Metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Sb, Pb, Se, Zn)	23
Polychlorinated biphenyls (PCBs)	23
Total organic carbon (TOC)	23
Asbestos identification	16
pH	12
Volatile Organic Compounds (VOCs)	6
Semi Volatile Organic Compounds (SVOCs)	6
Leachate Analysis	**No. of Samples**
Metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Sb, Pb, Se, Zn)	23
Chloride, fluoride, sulphate	23
Dissolved Organic Carbon, Total Dissolved Solids (TDS)	23
Total Phenols	23

6.6 Groundwater Sampling and Analysis

Groundwater sampling was completed by IGSL on 17 May 2017. As part of this assessment, groundwater samples were obtained from three newly installed monitoring wells (BH2, BH3 and BH8).

Sample bottles were dispatched to Scientific Analysis Laboratories Ltd, SAL based in Manchester, UK accompanied with an appropriate chain of custody and scheduled for analysis for the parameters outlined in Table 6.2 below.

Table 6.2 Groundwater Laboratory Analysis

Groundwater Analysis	No. of Samples
Speciated total petroleum hydrocarbons (TPH)	3
Benzene, Toluene, Ethylbenzene and Xylene (BTEX) compounds	3
Speciated 16 polycyclic aromatic hydrocarbons (PAHs)	3
Metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Sb, Pb, Se, Zn)	3
Polychlorinated biphenyls (PCBs)	3
Volatile Organic Compounds (VOCs)	3
Semi Volatile Organic Compounds (SVOCs)	3
Inorganics (potassium, alkalinity, chloride, ammoniacal nitrogen, nitrate, sulphate, calcium, potassium, magnesium and sodium)	3
Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD)	3

7. Site Investigation Findings

7.1 Geology

The site surface at all locations consisted of hardstanding to a depth of approximately 0.2m bgl with concrete present at the majority of locations and tarmacadam at the remainder. Beneath the hardstanding made ground generally comprised of dark brown very sandy clay and rubble fill was present to a depth of approximately 1.6m bgl. Made ground overlay natural soils (which included silt lenses at some location); natural soils consisted of firm to very stiff brown very gravelly clay with cobbles and became stiffer with depth.

A general summary of the geological profile encountered during this site investigation completed at the site is presented in Table 7.1 below:

Table 7.1 Summary of the geological profile

Unit	*Thickness (range)*	*Thickness (average)*	*Typical Depth (m bgl)*	*General Description*
Hardstanding	0.1m - 0.5m	0.2m	0.0m - 0.2m	Concrete or tarmacadam hardstanding
Made Ground	0.7m – 2.5m	1.6m	0.2m – 1.8m	Made ground consisting of loose, dark brown very gravelly sandy CLAY with frequent cobbles. brick and builders rubble fragments throughout
Silt	0.1m – 0.8m	0.4m	Sporadic in occurrence	Soft grey black sandy SILT
Clay	>1.4m	>1.4m	1.8m - >3.2m	Firm to very stiff brown very gravelly clay with cobbles

7.2 Field Observations Soil

Made ground including construction waste (brick fragments, slate, cobbles, tiles etc.) was encountered in the majority of trial pits and boreholes with small amounts of ash encountered at a limited number of trial pit and borehole locations. However physical evidence of contamination (i.e. odours, colours, hydrocarbon iridescence) was not encountered.

To assess levels of volatile ionisable compounds, field headspace testing was undertaken at trial pit and window sample borehole investigation locations at 0.5m intervals using a portable photo-ionisation detector (PID). PID results were generally very low (<5.0 parts per million) with a maximum PID reading of 67.7 parts per million (ppm) detected at TP4 (2.5m); a very slight hydrocarbon odour was detected at this location. The PID readings obtained did not identify a significant source of volatile contamination.

Asbestos containing materials (i.e. asbestos slates, lagging etc.) were not noted in soils in any of the trial pits.

8. Generic Quantitative Risk Assessment

8.1 Screening Criteria

A risk-based approach has been adopted for the assessment of data from the site which involves screening data against Generic Acceptance Criteria (GAC) appropriate for human health or controlled water (groundwater or surface water). This is an approach AECOM considers consistent with the principles of human health protection in Irish Environmental Protection Agency, UK DEFRA and UK Environment Agency guidance.

As the proposed end use is commercial with potentially some medium and high density residential use, the data has been assessed against criteria considered appropriate for a future residential use (without home grown produce). This is a conservative approach which will also be protective of on-site commercial receptors and off-site residential and commercial receptors. Soil leachate and groundwater data has been screened against GAC protective of controlled water receptors (i.e. groundwater and surface water).

Contaminant concentrations in soil and groundwater at the site were deemed 'potentially significant' where they exceeded the 'generic' values. These generic values are used for initial assessment of contaminant concentrations for the purpose of providing an initial indication of impacts at a site and evaluating the compounds that could proceed to a detailed assessment. As such, it should be noted that generic exceedances are not an indication of the requirement for remediation but rather, an indication of the need for further assessment.

Additionally, where further risk assessment is considered necessary, use of more site-specific information in the assessment can often lead to the conclusion that the observed concentrations are present at levels which represent an acceptable level of risk, considering the actual or proposed end use of a site (although each site assessment has to be considered on an individual basis).

8.1.1 Soil Screening Criteria

Human Health

The soil analytical data were compared with AECOM in-house Stage 2 GAC for residential development (without home grown produce). The soil GAC for the site are based on a sandy loam soil which was chosen to represent made ground (described as gravelly sandy clay) and underlying natural soils which were described as sandy silt and gravelly clay. The assumed total organic carbon content of between 0.58% and 1.45% in the derivation of the GAC is reasonably reflective of the values encountered on site which range from 0.22% to 4.4%, with a mean value of 1.42%.

The general hierarchy for selection of soil GAC at the site is as follows:

- LQM/CIEH Suitable 4 Use Levels Human Health Risk Assessment (2014);
- EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment (2010);
- Defra (2014) SP1010: Development of Category 4 Screening Levels for Assessment of Land Contamination; and
- US Environmental Protection Agency, Risk Screening Levels, (2015) - industrial (no vapours).

Controlled Waters

In terms of controlled waters (i.e. the underlying groundwater and nearby surface waters), there is a potential for soils to impact these via leaching. Soil GAC for the protection of controlled waters can derived using a theoretical soil:water partitioning coefficient. However, such GAC are likely to be very conservative and consequently, greater reliance is placed on actual groundwater and soil leachate data when assessing the potential risks to controlled waters receptors in the vicinity of the site as outlined in section 8.1.2 below.

8.1.2 Groundwater and Soil Leachate Screening Criteria

Human Health

In terms of human health risks, given that groundwater on site is not used for drinking purposes, the principal risk to human health from groundwater is via vapour inhalation. Therefore, groundwater concentrations were compared against AECOM GAC derived for the assessment of the vapour inhalation pathway in a residential setting, Where AECOM GAC are unavailable, groundwater concentrations were compared against Groundwater Standards albeit acknowledging that these criteria do not directly consider vapour risk.

The screening criteria do not provide detailed information on site-specific risks and, in a significant number of circumstances, may be viewed as being overly conservative. Nevertheless, these values are considered appropriate for initial screening of site conditions for the protection of human health.

Controlled Waters

In terms of controlled waters, appropriate generic assessment criteria were selected based on the site's environmental setting. The closest surface water is the Abby River, which is located 40m from the northern site boundary and the River Shannon located 180m from the western site boundary. Both of these rivers are tidal at this point.

The bedrock aquifer is classified by the GSI as a 'Ll - Locally important aquifer, bedrock which is moderately productive only in local zones'. The GSI indicates that there are no source protection zones within a 1km radius of the site. No groundwater wells have been identified within 1.0km of the site and the probability of wells in the area being sunk into the superficial overburden deposits or limestone aquifer for potable water is low due to the saline nature of the groundwater, and the availability of mains water within Limerick City Centre.

Based on the above analysis, the Abbey River and River Shannon are considered the most sensitive controlled waters receptor in the vicinity of the site. Accordingly, groundwater and soil leachate analytical data were assessed using the criteria from the following hierarchy:

- European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2015. S.I. No. 386 of 2015. Ireland - AA-EQS & MAC-EQS Transitional/Coast
- Ireland Marine EQS (AA) - European Communities Environmental Objectives (Surface Waters) Regs, 2009. Stat. Inst. No. 272 of 2009; European Communities Environmental Objectives (Surface Waters) (Amendment) Regs, 2010. Stat. Inst. No. 327 of 2012.
- The Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015. AA-EQS Transitional/Coast
- The Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015. MAC-EQS Transitional/Coast
- European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2016. S.I. No. 366 of 2016
- European Union Environmental Objectives (Groundwater) Regulations, 2010. Statutory Instrument No. 9 of 2010
- European Union (Drinking Water) Regulations 2014. Statutory Instrument No. 122 of 2014
- Environmental Protection Agency's Draft Interim Guidelines Values (IGVs) for the Protection of Groundwater, 2003

8.2 Soil Analytical Results – Human Health

In order to assess the quality of soils on site in terms of human health AECOM has considered the analytical results from 23 soil samples analysed from this investigation.

Soil analytical results are presented in Tables 1 and 2 in Appendix A and are screened against GAC protective of human health in a residential end use scenario without plant uptake as outlined in Section 8.1.1 above. SAL laboratory reports are presented in Appendix E

Total Petroleum Hydrocarbons, BTEX & MTBE

The analytical results for TPH, BTEX and MTBE for all soil samples were below the Stage 2 GAC protective of human health.

TPH concentrations were generally low and a maximum total aliphatic and aromatics EC5-EC44 concentration of 73 mg/kg was detected in the sample from TP6 (1.0m).

BTEX and MTBE concentrations were not detected in excess of the human health GAC and were below the laboratory MDL in all 23 samples analysed.

PAHs

The analytical results for PAHs in 22 of the 23 samples were below the Stage 2 GAC protective of human health.

A number of PAH parameters including benzo(a)pyrene and dibenzo(ah)anthracene exceeded the human health GAC in one sample WS01 (0.1-0.7m) as outlined in Table 8.1 below.

Metals (As, Ba, Cd, Cr, Cu, Mo, Hg, Ni, Pb, Sb, Zn)

The analytical results for metals in 18 of the 23 samples were below the Stage 2 GAC protective of human health.

The lead concentration in 5 soil samples exceeded the GAC of 310 mg/kg with a maximum concentration of 2,600 mg/kg detected in TP6 (1.0m).

Polychlorinated Biphenyls (PCBs)

The analytical results for PCBs in all soil samples were below the Stage 2 GAC protective of human health and in all cases were also less than the laboratory MDL.

Volatile Organic Compounds (VOCs)

The analytical results for VOCs in all soil samples were below the Stage 2 GAC protective of human health and in all cases were also less than the laboratory MDL.

Semi Volatile Organic Compounds (SVOCs)

The analytical results for SVOCs in all soil samples were below the Stage 2 GAC protective of human health and controlled water in all cases were also less than the laboratory MDL.

Asbestos

Sixteen soil samples were analysed for the presence of asbestos fibres. Asbestos was not detected in any of the soil samples analysed.

Table 8.1 Summary of Soil Exceedances – Human Health

Parameter	GAC protective of Human Health Residential Use (mg/kg)	Maximum Concentration Detected (mg/kg)	Number of Exceedances
Benzo(a)pyrene	3.2	3.9	1
Dibenzo(ah)anthracene	0.31	0.6	1
Lead	310	2600	5

8.3 Soil Leachate Analytical Results – Controlled Water

Soil leachate analytical results are presented in Table 3 in Appendix A in which they are screened against GAC protective of controlled waters as outlined in Section 8.1.2 above. SAL laboratory reports are presented in Appendix E.

Metals (As, Ba, Cd, Cr, Cu, Mo, Hg, Ni, Pb, Sb, Zn)

Stage 2 controlled waters GAC were exceeded in a number of soil leachate samples for parameters including arsenic, chromium, copper, mercury, lead and antimony as detailed in Table 8.2 overleaf.

Phenols

The analytical results for phenols in all soil leachate samples analysed were below the laboratory MDL.

Inorganics

Inorganic parameters for which leachate results are available include fluoride, chloride, and sulphate. Exceedances to the Stage 2 controlled waters GAC were not detected in the samples analysed.

Table 8.2 Summary of Soil Leachate Exceedances – Controlled Water

Parameter	GAC Protective of Controlled Water (mg/kg)	Source of GAC	Maximum Concentration Detected (mg/kg)	Number of Exceedances
Arsenic	0.075	Ireland GTVs 2016	0.11	3
Chromium	0.047	Ireland Freshwater EQS (AA)	0.068	1
Copper	0.05	Ireland Marine EQS (AA)	0.096	3
Mercury	0.0007	EU Env. Objectives Regs 2015. MAC-EQS Coast	0.023	1
Lead	0.013	EU Env. Objectives Regs 2015. (A-EQS Coast	0.15	5
Antimony	0.05	DWS Ireland 2014	2.4	6

8.4 Groundwater Analytical Results – Controlled Water and Human Health

Groundwater analytical results are presented in Tables 4 and 5 in Appendix A in which they are screened against GAC protective of controlled waters and human health as outlined in Section 8.1.2 above. SAL laboratory reports are presented in Appendix F.

Total Petroleum Hydrocarbons, BTEX & MTBE

The analytical results for TPH, BTEX and MTBE in all groundwater samples were below the Stage 2 GAC protective of human health and controlled water and were also below laboratory method detection limits.

PAHs

The analytical results for PAHs in all groundwater samples were below the Stage 2 GAC protective of human health and controlled water and were also below laboratory method detection limits.

Metals (As, Ba, Cd, Cr, Cu, Mo, Hg, Ni, Pb, Sb, Zn)

The analytical results for metals in all groundwater samples were below the Stage 2 GAC protective of human health and controlled water.

Inorganics

With the exception of potassium, inorganic parameter concentrations (alkalinity, chloride, ammoniacal nitrogen, nitrate, sulphate, calcium, magnesium and sodium) did not exceed GAC protective of human health or controlled water.

Potassium concentrations in all three samples exceeded the controlled water GAC (groundwater) of 5.0mg/l with a maximum concentration of 15mg/l detected in the sample from BH3.

Volatile Organic Compounds (VOC's)

The analytical results for VOCs in all groundwater samples were below the Stage 2 GAC protective of human health and controlled water and in all cases were also less than the laboratory MDL.

Semi Volatile Organic Compounds (SVOCs)

The analytical results for SVOCs in all groundwater samples were below the Stage 2 GAC protective of human health and controlled water and in all cases were also less than the laboratory MDL.

Other Organics

Biochemical oxygen demand and chemical oxygen demand in all groundwater samples were low and within expected background levels.

9. Updated Conceptual Model

Based on the information gained from the GQRA, the conceptual model developed in the preliminary risk assessment has been reviewed and is discussed in detail below.

9.1 Sources

9.1.1 Soil Sources

Based on the results of the GQRA, a potential risk to human health (future residential users) was identified due to slightly elevated PAHs in a number of soil samples and significantly elevated lead concentrations in five soil sample. Where exceedances were encountered they were associated with made ground which is located close to the site surface (from ground level to a depth of approximately 1.6m bgl). A large portion of this made ground will be removed as part of the redevelopment work but some may remain on site where excavation is shallow or not required.

There is a potential for soils to impact controlled waters (i.e. the underlying groundwater and nearby surface waters) via leaching. Analytical results have shown a potential risk posed by soils to groundwater for a variety of metal parameters including arsenic, chromium, copper, mercury, lead and antimony. However, this assessment is based on leachates generated within a laboratory and as elevated metal concentrations were not detected in groundwater beneath the site the risk posed by leaching of metals from soils is not considered a significant source. As with human health risk, where exceedances were encountered they were principally associated with made ground which is located close to the site surface and a large portion of this made ground will be removed as part of the redevelopment work.

9.1.2 Groundwater Sources

Groundwater beneath the site is not considered to be a source of risk to human health as exceedances of the GAC were not detected.

Groundwater beneath the site is not considered to be a source of risk to controlled water receptors (Abbey River, River Shannon or groundwater) as with the exception of potassium exceedances of GAC protective of these receptors were not encountered.

9.2 Potential Receptors

Receptors are defined by their potential for being adversely affected by a contaminant. For the purposes of this assessment, receptors have been split into human health and environmental receptors.

9.2.1 Human Health

AECOM understand that the site is to be redeveloped for predominantly commercial use with some medium and high density residential units. The on-site human health receptors are considered to be residential (without home grown produce) and commercial users.

Off-site receptors are also considered to be residential, due to the proximity of residential housing and apartments to the east and west of the site and commercial.

9.2.2 Controlled Waters

The following potential controlled waters receptors were identified given the environmental setting of the site:

Table 9.1 Controlled Water Receptors

Water Environment Receptors	Present (Y/N)	Potable Supply (Y/N)	Description/Comments
Groundwater abstraction within 500m of the site.	No	No	There are no known groundwater abstractions within 500m of the site. The site and surrounding area is serviced by mains water supply.
Surface water body within 500m of the site in direct hydraulic connection with groundwater from the site.	Yes	No	Abbey River located approximately 40m north of the site and is tidal at this point.
		No	River Shannon is located approximately 180m west of the site and is tidal at this point.
Groundwater in bedrock beneath the site.	Yes	Possible	The bedrock aquifer underlying the site is classified by the GSI as a"Locally Important Aquifer", that is "moderately productive only in local zones".
Groundwater in superficial deposits beneath the site.	Yes	No	The superficial deposits beneath the site consist of made ground and marine/estuarine silts and clays and are not considered to be an aquifer.

9.3 Potential Pathways

Future redevelopment of the site is likely to include construction of basement car parking over the majority of the site and/or cover with building footprint, hard standing or imported fill materials over a large proportion of the remainder. Excavation of made ground from across the site will reduce the risk posed by contaminants present in near surface soil and made ground and the proposed development will itself limit the pathways for exposure of site users to any contamination contained within the underlying made ground / soil by removing pathways including soil and dust ingestion, dermal contact, inhalation of fugitive dust from the majority of the site. Potential exposure pathways in these areas to human health are therefore confined to the vapour migration pathway which is not considered significant as volatile contaminants were not identified at the site in excess of GAC protective of human health.

Certain areas of the site are earmarked for public plaza; pedestrian linkages; communal and private open space. Should these area allow contact with or leave exposed existing made ground; pathways such as soil and dust ingestion, dermal contact, inhalation of fugitive dust will remain viable.

It should be noted that ground conditions beneath basements / cellars of existing buildings have not been assessed and potential risks posed to users of existing structures which are to be retained cannot be discounted.

A potential risk was identified through leaching of contaminants (principally metals) from soils at the site. However, as discussed previously groundwater at the site did not contain contaminants of concern at concentrations in excess of GAC protective of controlled water and leaching is not considered a significant pathway. Furthermore, the presence of stiff clay beneath the site and cover of large areas of the site with buildings or hard standing during future development will restrict the potential vertical pathway for water moving beneath the site and limit rainfall percolation, consequently reducing further leachate generation. Excavation of made ground from across the site will further reduce the risk posed by contaminants present in near surface soil and made ground.

9.4 Risks Assessment Procedure

By considering the sources, pathways and receptors (pollutant linkages), an assessment of the human health and environmental risks is made with reference to the significance and degree of the risk. This assessment is based on consideration of whether the source contamination can reach a receptor, and hence whether it is of major or minor significance.

The risk assessment has been undertaken with reference to BS10175:2001 and CIRIA Document C552: 'Contaminated Land Risk assessment - A Guide to Good Practice'. The risk assessment has been carried out by assessing the severity of the potential consequence, taking into account both the potential severity of the hazard and the sensitivity of the target, based on the categories given in Table 9.2 below.

Table 9.2 Potential Hazard Severity Definition

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters.
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures.
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures.
Minor	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species.

The likelihood of an event (probability) takes into account both the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given in Table 9.3 below.

Table 9.3 Probability of Risk Definition

Category	Definition
High likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable.

The potential severity of the risk and the probability of the risk occurring have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard as shown in the table 9.4 below.

Table 9.4 Level of Risk for Potential Hazard Definition

Probability of Risk	Potential Severity			
	Severe	Medium	Mild	Minor
High	Very high	High	Moderate	Low/Moderate
Likely	High	Moderate	Low/Moderate	Low
Low	Moderate	Low/Moderate	Low	Very low
Unlikely	Low/Moderate	Low	Very low	Very low

Table 9.5 Revised Conceptual Site Model

Source	Pathway	Receptor	Severity	Likelihood	Potential Risk	Discussion
PAH concentrations one made ground samples in excess of Stage 2 screening criteria Lead concentrations in five made ground samples in excess of the Stage 2 screening criteria	Landscaped Areas Only • Soil and dust ingestion • Dermal contact • Inhalation of fugitive dust	• Future site users in a residential scenario • Future site users in a commercial end use scenario • Off-site residents of neighbouring properties • Off-site users of commercial buildings	Medium	Unlikely	Low (provided there is no pathway to made ground remaining in-situ following redevelopment)	Future redevelopment of the site is likely to include basement excavation and cover with hard standing or a building over a large proportion of the site which will remove much of the source and limit the pathways for exposure of site users Should areas of the site be earmarked for landscaped areas including lawns and planting of trees and/or bushes a source-pathway-receptor pollutant linkage exists but can be broken by capping landscaped areas with a surface cover of clean imported fill at least 750mm thick and / or with a geomembrane.
Metals in soil across the site in excess of the Stage 2 criteria protective of controlled water.	• Leaching from soil to groundwater • Vertical and horizontal migration of groundwater	• Groundwater in bedrock beneath the site	Mild	Unlikely	Very Low	Groundwater at the site did not contain contaminants of concern at concentrations in excess of GAC protective of controlled water. Excavation of made ground and cover of large areas of the site with buildings or hard standing during future development will limit leachate generation and further reducing the risk posed to groundwater beneath the site and to nearby surface water.
		• Off-site surface water including Abbey River and River Shannon	Mild	Unlikely	Very low	

9.5 Discussion of Revised Site Conceptual Model

Based on the results of the GQRA, a potential risk to future site users has been identified from PAHs and metals in made ground at the site. Basement excavation will remove a large proportion of made ground and the majority of the site will be covered in buildings or hardstanding breaking potential pathways.

The viable pathway between soil remaining in-situ following redevelopment work and future human health receptors is therefore limited to future landscaped areas. Provided that the future development plan provides building cover, hard standing or a surface cover of clean imported fill with a minimum thickness of 750mm and/or a geomembrane, the risks posed to future site users by PAHs and metals will be low.

It should be noted that ground conditions beneath basements / cellars of existing buildings have not been assessed and potential risks posed to users of existing structures which are to be retained cannot be discounted.

Leaching of metals from made ground was found to be a potential risk but groundwater at the site did not contain contaminants of concern at concentrations in excess of GAC protective of controlled water.

Excavation of made ground from across the site will reduce the risk posed by contaminants present in near surface soil and as large areas of the site will be covered by buildings or hard standing during future development, this will limit leachate generation further reducing reduce the risk posed by leachate to groundwater and surface water. Based on the results of the GQRA a very low risk to surface water and groundwater have been identified.

10. Preliminary Soil Waste Classification

A preliminary soil waste classification was undertaken to assess the general nature of the made ground material and natural soil present at the site, in order to identify potential disposal routes for these materials that will require removal as part of basements/services trenches etc. at the site. This assessment has considered the analytical results from 23 soil samples analysed from this investigation.

Assessment of the laboratory data was carried out by screening the composite soil sample results against the following waste classification criteria:

Waste Category	Classification Criteria
Category A Inert**	Reported concentrations less than inert waste guidelines, which are based on waste acceptance criteria set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HazWasteOnline^{tm} application*.
Category B Inert – MEHL	Reported concentrations greater than Category A criteria but less than Murphy Environmental Hollywood Limited (MEHL) inert waste licensed landfill acceptance criteria, as set out in their Waste Licence W0129-02. Results also found to be non-hazardous using the HazWasteOnline^{tm} application*.
Category C1 Non Hazardous	Analytical results greater than Category A and B criteria but not classified as hazardous using the HazWasteOnlinetm application*.
Category C2 Non Hazardous	As Category C1 but containing < 0.001% w/w asbestos fibres.
Category C3 Non Hazardous	As Category C1 but containing >0.001% and <0.01% w/w asbestos fibres.
Category C4 Non Hazardous	As Category C1 but containing >0.01% and <0.1% w/w asbestos fibres.
Category D1 Hazardous for Export	Analytical results found to be hazardous using the HazWasteOnline^{tm} application* with PAH concentration <500mg/kg and mineral oil concentration <8000mg/kg.
Category D2 Hazardous for Export	Analytical results found to be hazardous using the HazWasteOnline^{tm} application* but containing >0.01% w/w asbestos fibres.
Category D3 Hazardous for Export	Soil which has been classified as hazardous solely due to presence of asbestos

* http://www.hazwasteonline.com. Application developed by One Touch Data Limited based on Regulation (EC) No. 1272/2008: the classification, labelling and packaging of substances and mixtures (CLP) and the latest UK Environment Agency guidance, WM3. AECOM's experience has shown that this approach is considered acceptable to the EPA and Local Authorities.

**Please note: While waste soil is classified as Inert based on the EU Council Decision 2003/33/EC, waste acceptance criteria may vary at each potential waste receiving facility and further assessment and consultation may be required with the proposed waste receiving facility to confirm suitability for disposal In terms of Waste Permitted sites. Further assessment in terms of potential impact to the environment may be required or inert waste comprising made ground may not be considered acceptable.

10.1 Waste Classification Results

Laboratory results for the soil samples collected by AECOM are presented in Table 5 in Appendix A. SAL laboratory reports are presented in Appendix E attached to this report and HazWasteOnline™ classification reports are provided in Appendix G.

Based on the available analytical results, the following waste categories were identified and classified in accordance with European Waste Catalogue and Hazardous Waste List (EPA, 2002). The findings of the hazardous waste classification are presented in Table 10.1 overleaf.

Table 10.1 Waste Classification

Location	Depth m bgl	Soil Type	Waste Classification	Waste Classification Category
TP2	0.5	Made Ground	**Category A Inert**	17 05 04
TP2	2	Made Ground	**Category A Inert**	17 05 04
TP3	1.0	Made Ground	**Category A Inert**	17 05 04
TP3	2.5	Made Ground	**Category A Inert**	17 05 04
TP4	0.5	Made Ground	**Category C1 Non Hazardous**	17 05 04
TP4	2.0	Clay	**Category A Inert**	17 05 04
TP5	0.5	Made Ground	**Category C1 Non Hazardous**	17 05 04
TP6	1.0	Made Ground	**Category D1 Hazardous for Export**	17 05 03
TP6	3.0	Made Ground	**Category C1 Non Hazardous**	17 05 04
WS01	0.1-0.7	Made Ground	**Category B Inert**	17 05 04
WS01	1.45 - 2.60	Clay	**Category A Inert**	17 05 04
WS02	0.1 - 0.55	Made Ground	**Category A Inert**	17 05 04
WS02	1.05 - 2.9	Clay	**Category A Inert**	17 05 04
WS03	0.1 - 0.35	Made Ground	**Category A Inert**	17 05 04
WS03	0.35 - 1.0	Clay	**Category A Inert**	17 05 04
WS04	0.05 - 2.1	Made Ground	**Category B Inert**	17 05 04
WS04	2.1 - 2.6	Clay	**Category A Inert**	17 05 04
WS05	0.05 - 1.35	Made Ground	**Category D1 Hazardous for Export**	17 05 03
WS05	2.0 - 2.6	Clay	**Category C1 Non Hazardous**	17 05 04
WS07	0.2 - 2.4	Made Ground	**Category B Inert**	17 05 04
WS07	2.4 - 2.9	Clay	**Category A Inert**	17 05 04
WS08	0.2 - 1.0	Made Ground	**Category A Inert**	17 05 04
WS08	2.0 - 2.4	Clay	**Category C1 Non Hazardous**	17 05 04

Table 10.2 Summary of Soil Waste Classification

Waste Classification		EWC CODE	Number of Made Ground Samples	Number of Clay Samples	Total Number of Samples
Category A	Inert	17 05 04	7	6	13
Category B	Inert	17 05 04	3	-	3
Category C1	Non-Hazardous	17 05 04	3	2	5
Category D1	Hazardous	17 05 03	2	-	2

Made ground samples from the site have been classified as a mixture of inert, non-hazardous and hazardous. Ten made ground samples were classified as inert (Category A and Category B); three made ground samples classified as non-hazardous (Category C) principally due to the presence of metals (antimony and molybdenum in leachate); and two made ground samples classified as Hazardous (Category D1) due to the presence of metals in bulk soil (lead and zinc).

The majority of natural clay samples from the site at the site have been classified as inert (Category A) with two soil samples classified as Non-Hazardous (Category C) due to the presence of molybdenum and mercury in leachate.

While waste soil is classified as Inert, waste acceptance criteria may vary at each potential waste receiving facility. Many inert facilities are only permitted to accept “clean soil and stone from greenfield sites” and soil at the site, particularly made ground which contained significant quantities of red brick, mortar, concrete, wood, plastic and metal fragments may not be acceptable at many inert facilities. Consultation may be required with the proposed waste receiving facility to confirm suitability for disposal In terms of Waste Permitted sites. Further assessment in terms of potential impact to the environment may be required or inert waste comprising made ground may not be considered acceptable.

10.2 Soil Waste Management

It should be noted that a Soil Management Plan including and excavation plan should be developed for the site indicating waste soil classifications to enable the Client or appointed Contractor identify appropriate disposal/transfer routes for proposed excavated material based on the nature of the material i.e. made ground or natural soil.

In addition to the above in-situ soil assessment, service clearance, foundation excavation and pile arising’s will be generated during the works. These should be segregated, stockpiled on site and sampled. Soil waste classification should be completed on these materials in order to identify an appropriate waste receiving facility.

Prior to the transfer of material from the site for export or to a specific waste permitted/licensed site, the appropriate waste classification data should be submitted to the permit/licence holder to confirm the suitability of the material in writing for the transfer to their facility.

In order to control off-site soil movements and undertaken appropriate waste disposal/recovery, a comprehensive docketing system should be detailed in the site construction waste management plan and implemented on the site. A daily record (including preparing and reconciling waste transfer notes) of soil excavation at the site should be maintained by the appointed contractor.

The documentation to be maintained in relation to soil wastes includes the following:

- The names of the agent(s) and the transporter(s) of the wastes;
- The name(s) of the person(s) responsible for the ultimate recovery or disposal of the wastes;
- The ultimate destination(s) of the wastes;
- Written confirmation of the acceptance and recovery or disposal of any hazardous waste consignments;
- The tonnages and EWC (European Waste Catalogue) Code for the waste soil materials;
- Details of each individual consignment dispatched from site:
  - Description of waste (source description, stockpile number or type and origin of soil);
  - Date and time of dispatch from site;

  - Name of haulage company;
  - Details of Contractor and Haulier docket numbers;
  - Vehicle registration number and driver name;
  - Volume/weight of waste removed;
  - Name of waste receiving facility;
  - Date and time of arrival at waste receiving facility.
- Details of any rejected consignments;
- The Waste Transfer Forms for hazardous soil wastes transferred from the site (stamped at receiving facility);
- The Trans-frontier Shipment of Waste forms for hazardous soil wastes transferred abroad; and
- The results of any analysis conducted on excavated soil.

It is recommended that waste transfer notes are issued in triplicate. On dispatch, the note should be signed by the issuing operative and one copy retained at the site office. The remaining two copies should accompany the load and signed or stamped by the receiving facility. One of these signed copies should be returned to the site office for reconciliation. It is noted that a suitably licensed hauler should be appointed to transfer waste soil from site.

11. Findings and Conclusions

AECOM (in conjunction with IGSL) completed an Environmental Site Assessment for the Project Opera site located in Limerick City Centre. The site investigation involved excavation of four trial pits, seven window sample boreholes and installation of six groundwater monitoring wells across the site as well as subsequent laboratory analysis of soil and groundwater samples.

During the site investigation there was no evidence of significant contamination present at the site; however; there is made ground present across the site which contains some construction waste materials and small volumes of potential contaminants such as ash. Groundwater was identified during this investigation within shallow soils and made ground.

A risk-based approach was adopted for the assessment of data from the site. Laboratory data was screened against criteria considered appropriate for a residential end use (without home-grown produce) and within the context of the site environmental setting. Contaminant concentrations in soil and groundwater at the site were deemed ‘potentially significant’ where they exceeded the GAC and where a potential source-pathway-receptor linkage was present.

- PAH compounds in one soil samples and metal concentrations in five soil samples exceed the GAC protective of human health;
- Metal concentrations in a number of soil leachate samples exceeded the GAC protective of Controlled Water; and
- Groundwater concentrations did not exceed GAC protective of human health or groundwater or surface waters.

Based on the results of the GQRA, the following is concluded:

- A low risk to future site users has been identified from contaminants present in made ground at the site.
- A low risk to groundwater and surface waters has been identified due to leaching of contaminants from soil to groundwater.

It is expected that risks to off-site residents and construction workers during construction works at the site will be suitably mitigated with the implementation of robust Environmental Control Measures (i.e. dust suppression, wheel washes) and the use of appropriate Personal Protective Equipment (PPE) by construction workers.

The preliminary soil waste classification carried out by screening analytical results from 23 soil samples against waste classification criteria indicated that:

- Ten of the 15 made ground samples have been classified as Inert Category A or Category B (EWC: 17 05 04 Soil & stones);
- Six of the 8 natural clay soil samples at the site have been classified as Inert Category A or Category B (EWC: 17 05 04 Soil & stones);
- Three of 15 made ground and 2 of 8 natural soil samples classified as non-hazardous Category C1 (EWC: 17 05 04 Soil & stones); and
- The remaining 2 made ground samples have been classified as hazardous Category D1 (Soil and stones containing hazardous substances) due to the presence of metals within these samples.

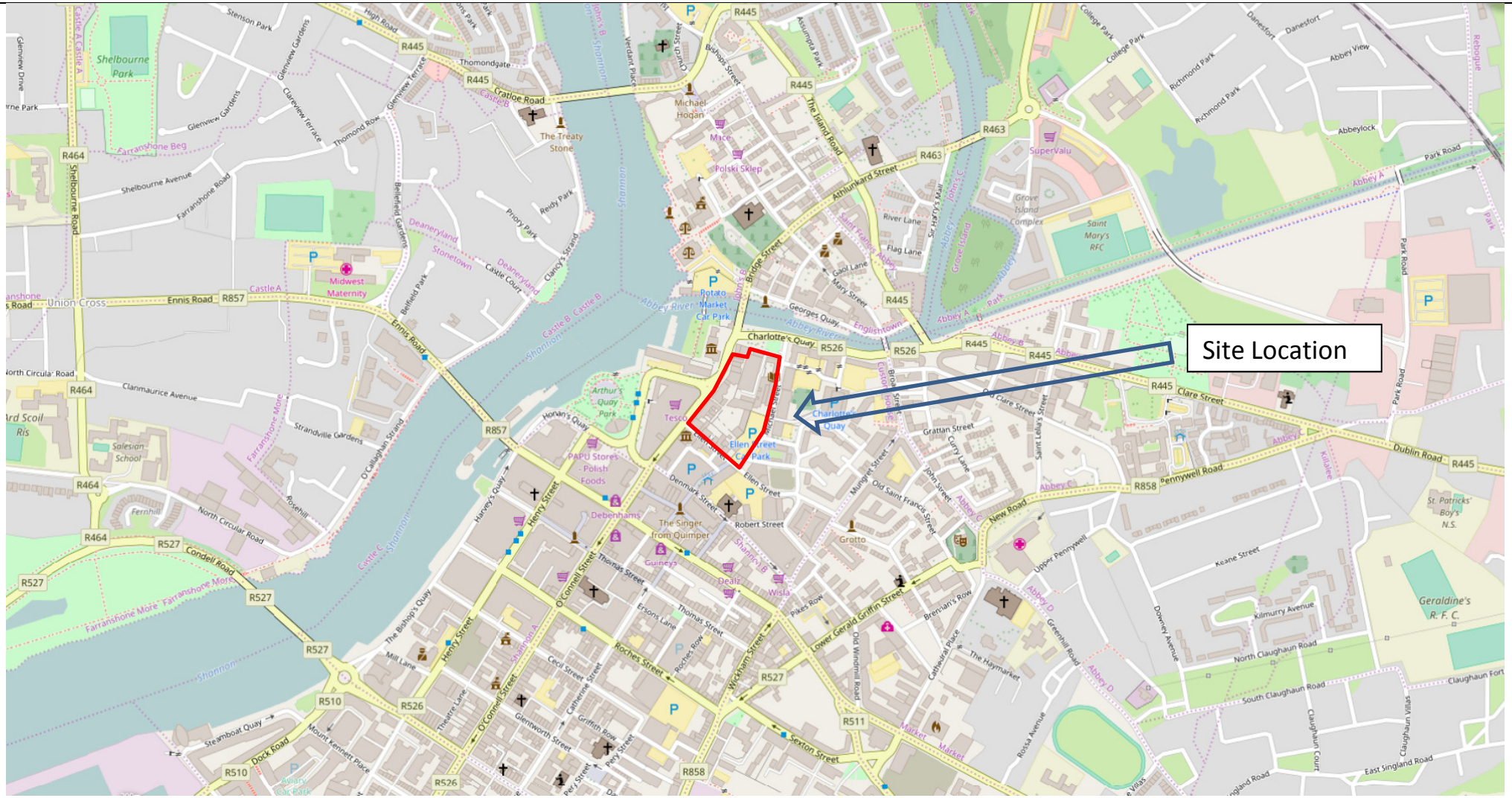
12. Recommendations

Made ground at the site was found to pose a potential risk, albeit low, to future users of the site. It is recommended that any areas of the development which will not be covered in buildings or hard standing such as landscaped open areas are either capped with an impermeable membrane or covered with a layer of clean imported fill material to a depth of at least 750mm during the redevelopment work thereby reducing the potential risk.

The waste classification at the site showed that made ground was impacted with a variety of organic and inorganic parameters and as such has been classified as a mixture of Inert, Non-Hazardous and Hazardous with a variety of disposal outlets required for material to be excavated.

The site contractor should be cognisant of these classifications and develop a dig plan which identifies areas of the site to be excavated and material to be disposed of as well as identification of appropriate disposal outlets for this material. It is recommended that the laboratory reports are provided to potential waste disposal outlets and that written confirmation of acceptance form disposal outlets is obtained prior to commencement of site works.

Figures



AECOM

4TH FLOOR, ADELPHI PLAZA, ADELPHI CENTRE,
GEORGE'S STREET UPPER,
DUN LAOGHAIRE, CO. DUBLIN, IRELAND. T +353 (0)1 238 3100, F +353 (0)1 238 3199

Drawing Title

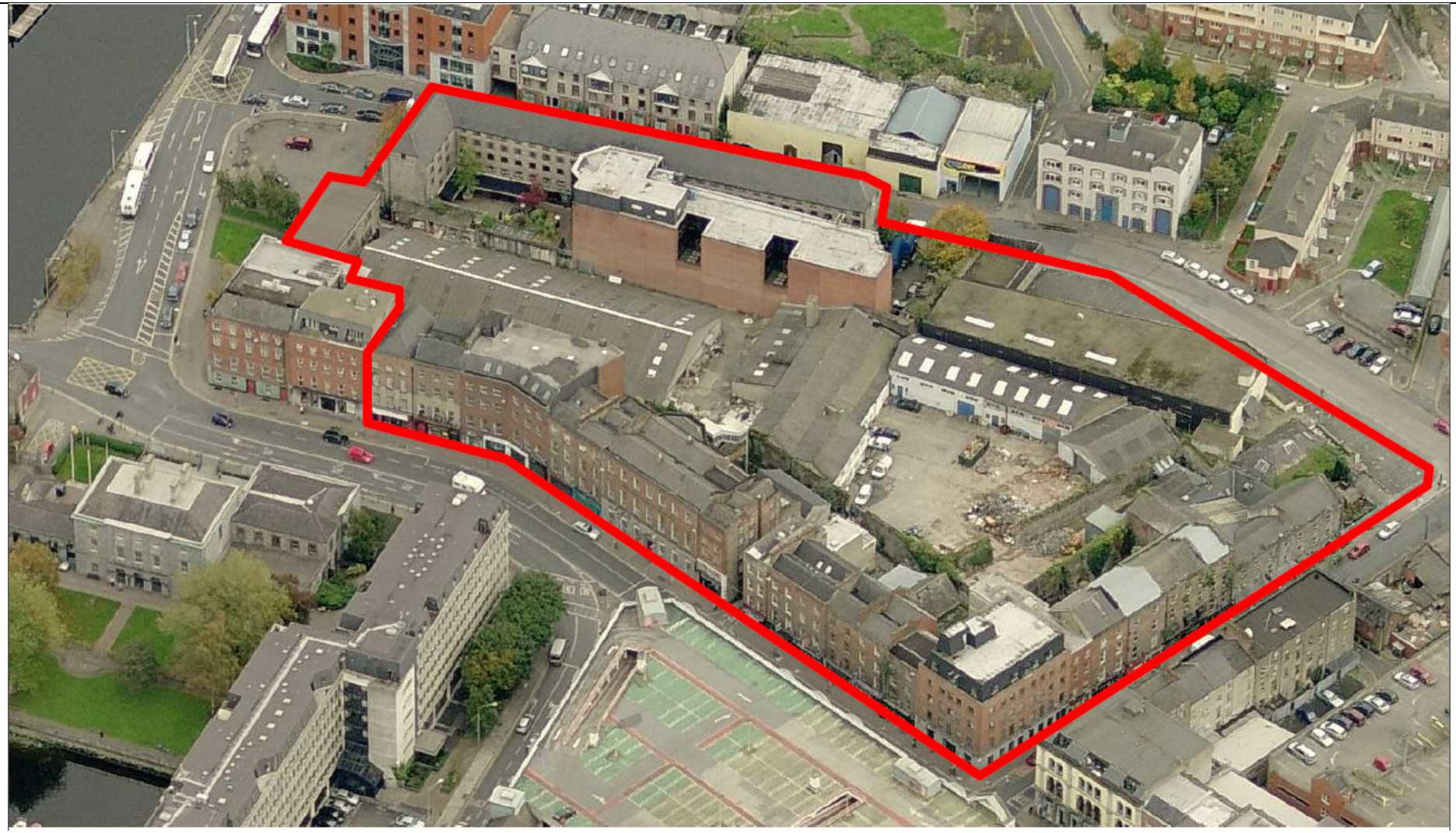
Figure 1

Site Location Plan

Client
Limerick City & County Council / Limerick 2030

Project
Project Opera, Limerick

Indicative Site Boundary



AECOM

4TH FLOOR, ADELPHI PLAZA, ADELPHI CENTRE,
GEORGE'S STREET UPPER,
DUN LAOGHAIRE, CO. DUBLIN, IRELAND. T +353 (0)1 238 3100, F +353 (0)1 238 3199

Drawing Title

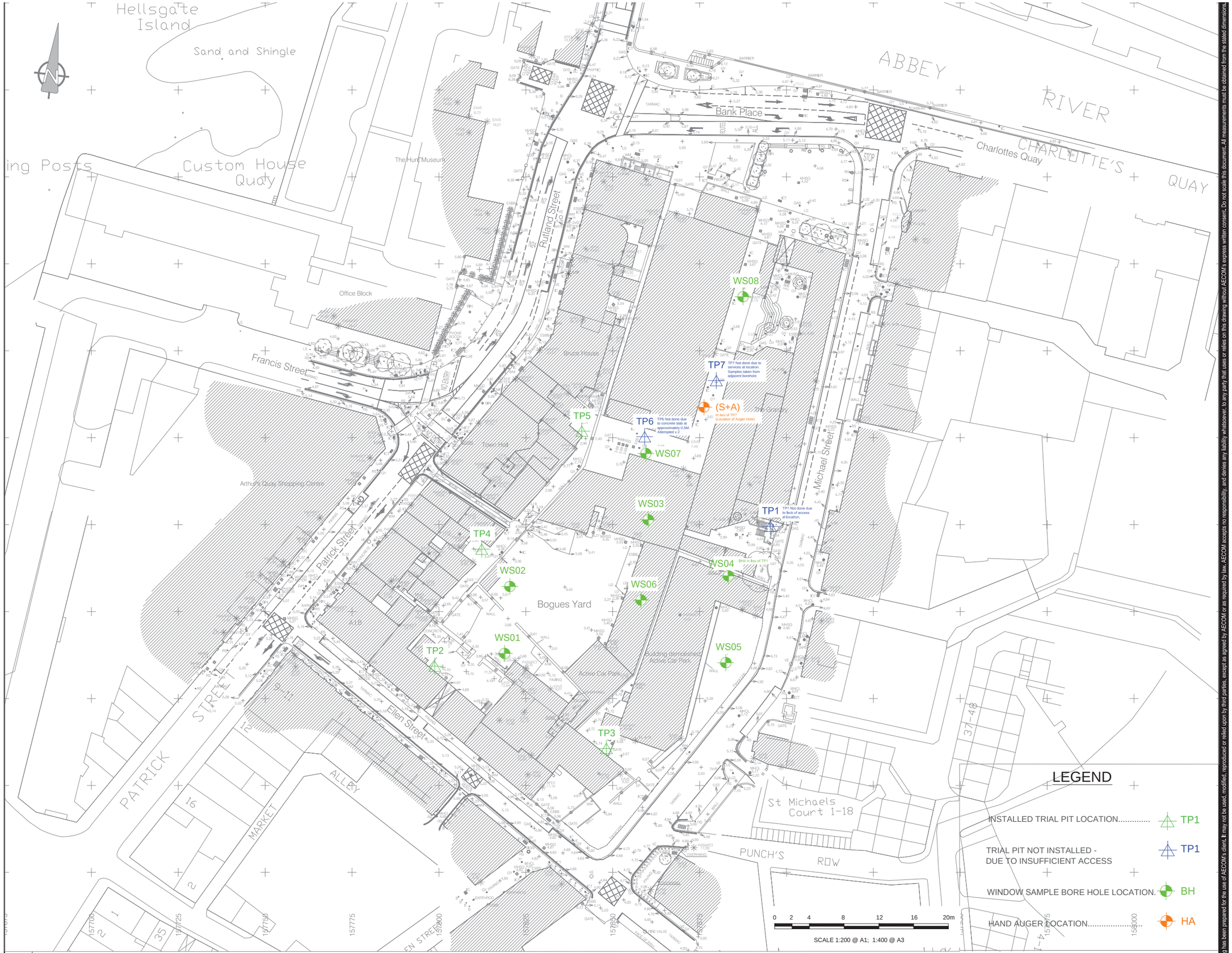
Figure 2

Site Layout

Client
Limerick City & County Council / Limerick 2030

Project
Project Opera, Limerick

Indicative Site Boundary



LEGEND

- INSTALLED TRIAL PIT LOCATION..... TP1
- TRIAL PIT NOT INSTALLED - DUE TO INSUFFICIENT ACCESS TP1
- WINDOW SAMPLE BORE HOLE LOCATION. BH
- HAND AUGER LOCATION..... HA

A | **SITE INVESTIGATION TEST LOCATIONS**

610 Scale: 1:200

Project Management Initials: Designer: CD Checked: MD Approved: CO'B ISO A1 594mm x 841mm

Filename: C:\USERS\SARAH_MCLOONE\DESKTOP\60533084--410 PROJECT OPERA SITE SURVEY.DWG Last saved by: SARAH.MCLOONE Last Plotted: 2017-05-31

AECOM

PROJECT

PROJECT OPERA SITE INVESTIGATION

CLIENT

LIMERICK 2030

CONSULTANT

AECOM
4th Floor, Adelphi Plaza
George's Street Upper
Dun Laoghaire
Co. Dublin
Ireland
Tel:+353 (0) 1 238 3100
Fax:+353 (0) 1 238 3199
www.aecom.com

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS, ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER.
2. ALL DIMENSIONS TO BE CONFIRMED BY THE CONTRACTOR ON SITE PRIOR TO COMMENCEMENT OF WORKS.
3. AECOM LIMITED TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORKS ON SITE.
4. DIMENSIONS OF ALL BOUNDARIES AND ADJOINING ROADS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
5. DO NOT SCALE, ALL MEASUREMENTS AND COORDINATES TO BE CHECKED ON SITE.

ISSUE/REVISION

I/R	DATE	DESCRIPTION
A	07.02.2017	INITIAL ISSUE

PROJECT NUMBER

60533084

SHEET TITLE

SITE INVESTIGATIONS
TRIAL PIT AND BORE HOLE LOCATIONS

SHEET NUMBER

60533084 -- 610

Appendix A - Tables

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 1

Sample Type			**HH Soil. Residential without Plant Uptake. Sandy Loam. TOC >=0.58 to <1.45%**	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID				TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP6	TP6
Sample Depth (m)				0.5	2	1.0	2.5	0.5	2.0	0.5	1.0	3.0
				Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Clay	Made Ground	Made Ground	Made Ground
Date Sampled				09/05/2017	09/05/2017	10/05/2017	10/05/2017	09/05/2017	09/05/2017	09/05/2017	10/05/2017	10/05/2017
Lab Reference				17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Parameters	**Units**	**MDL**										
TPH CWG												
TPH Aliphatics												
TPH (>EC5-6) aliphatic	mg/kg	1.0	42	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC6-8) aliphatic	mg/kg	1.0	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC8-10) aliphatic	mg/kg	1.0	27	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC10-12) aliphatic	mg/kg	1.0	130	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC12-16) aliphatic	mg/kg	1.0	1100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC16-21) aliphatic	mg/kg	1.0	nc	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (EC21-35) aliphatic	mg/kg	1.0	nc	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	12	< 1.0
TPH (EC35-44) aliphatic	mg/kg	1.0	65000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatics (C5-C44)	mg/kg	5.0	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	12	< 5.0
TPH Aromatics												
TPH (>EC5-7) aromatic	mg/kg	1.0	370	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC7-8) aromatic	mg/kg	1.0	860	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC8-10) aromatic	mg/kg	1.0	47	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC10-12) aromatic	mg/kg	1.0	250	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC12-16) aromatic	mg/kg	1.0	1800	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC16-21) aromatic	mg/kg	1.0	1900	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	28	< 1.0	4.2	< 1.0
TPH (>EC21-35) aromatic	mg/kg	1.0	1900	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	43	< 1.0	57	< 1.0
TPH (>EC35-44) aromatic	mg/kg	1.0	1900	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatics (C5-C44)	mg/kg	5.0	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	71	< 5.0	61	< 5.0
Total aliphatics & aromatics (C5-C	mg/kg	10	nc	< 10	< 10	< 10	< 10	< 10	71	< 10	73	< 10
BTEX												
Benzene	ug/kg	1.0	380	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1.0	880000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1.0	83000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m/p-Xylene	ug/kg	1.0	84000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	ug/kg	1.0	88000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
BTEX	ug/kg	5.0	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE												
MTBE	ug/kg	1.0	73000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOC												
Total Organic Carbon	%	0.2	nc	1.6	0.22	0.74	1.1	0.96	< 0.20	2.6	2.3	< 0.20
PAHs												
Naphthalene	mg/kg	0.1	2.3	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10	< 0.10
Acenaphthylene	mg/kg	0.1	2900	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	3000	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	2800	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	1300	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.49	< 0.10
Anthracene	mg/kg	0.1	31000	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	1500	0.13	< 0.10	<0.5	<0.5	0.2	<0.5	< 0.10	1.6	< 0.10
Pyrene	mg/kg	0.1	3700	0.12	< 0.10	<0.5	<0.5	0.18	<0.5	< 0.10	1.6	< 0.10
Benzo(a)anthracene	mg/kg	0.1	11	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.85	< 0.10
Chrysene	mg/kg	0.1	30	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	1.2	< 0.10
Benzo(b)fluoranthene	mg/kg	0.1	3.9	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	1.1	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	110	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.72	< 0.10
Benzo(a)pyrene	mg/kg	0.1	3.2	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	1.2	< 0.10
Indeno(123cd)pyrene	mg/kg	0.1	45	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.86	< 0.10
Dibenzo(ah)anthracene	mg/kg	0.1	0.31	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.3	< 0.10
Benzo(ghi)perylene	mg/kg	0.1	360	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.81	< 0.10
Total 16 PAHs	mg/kg	2	nc	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	11	< 2.0
PCBs												
PCB 28	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	mg/kg	0.010	0.12	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB Total of 7 Congeners	mg/kg	0.10	0.23	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Heavy Metals												
Arsenic	mg/kg	1.0	40	23	15	17	15	22	20	28	26	23
Barium	mg/kg	10.0	1300	74	66	70	68	330	33	120	320	32
Cadmium	mg/kg	0.1	85	0.28	0.7	0.34	0.56	0.36	0.33	0.41	0.48	0.35
Chromium	mg/kg	1.0	910	13	16	14	14	18	9.7	19	19	8.4
Copper	mg/kg	0.5	7100	25	18	25	28	31	11	65	47	8.9
Mercury	mg/kg	0.1	56	0.56	0.2	0.63	0.23	0.84	0.12	1.6	0.86	0.13
Molybdenum	mg/kg	2.0	670	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.2	< 2.0	< 2.0
Nickel	mg/kg	0.5	180	19	33	19	20	20	15	26	25	13
Lead	mg/kg	0.5	310	78	19	87	39	500	16	270	2600	24
Antimony	mg/kg	2.0	550	3.2	2	< 2.0	< 2.0	3	< 2.0	5.8	370	10
Selenium	mg/kg	0.2	430	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	mg/kg	0.5	40000	51	39	42	54	160	22	150	320	21
pH - solid	pH units	0.10	nc	11.6	-	-	8.2	-	8.7	-	10.8	8.9
Asbestos Fibres in Soil												
ACM Type Detected	Presence	0.001	nc	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected

xx Exceedance - HH Soil. Residential without Plant Uptake

NOTES

MDL	
-	
nc	No Criteria
TPH CWG	Total Petroleum Hydrocarbons Criteria Working Group
NAD	No Asbestos Detected

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 1

Sample Type			**HH Soil. Residential without Plant Uptake. Sandy Loam. TOC >=0.58 to <1.45%**	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID				WS01	WS01	WS02	WS02	WS03	WS03	WS04	WS04	WS05
Sample Depth (m)				0.1-0.7	1.45 - 2.60	0.1 - 0.55	1.05 - 2.9	0.1 - 0.35	0.35 - 1.0	0.05 - 2.1	2.1 - 2.6	0.05 - 1.35
				Made Ground	Clay	Made Ground	Clay	Made Ground	Clay	Made Ground	Clay	Made Ground
Date Sampled				09/05/2017	09/05/2017	09/05/2017	09/05/2017	09/05/2017	09/05/2017	10/05/2017	10/05/2017	10/05/2017
Lab Reference				17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Parameters	**Units**	**MDL**										
TPH CWG												
TPH Aliphatics												
TPH (>EC5-6) aliphatic	mg/kg	1.0	42	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC6-8) aliphatic	mg/kg	1.0	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC8-10) aliphatic	mg/kg	1.0	27	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC10-12) aliphatic	mg/kg	1.0	130	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC12-16) aliphatic	mg/kg	1.0	1100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC16-21) aliphatic	mg/kg	1.0	nc	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (EC21-35) aliphatic	mg/kg	1.0	nc	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (EC35-44) aliphatic	mg/kg	1.0	65000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatics (C5-C44)	mg/kg	5.0	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TPH Aromatics												
TPH (>EC5-7) aromatic	mg/kg	1.0	370	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC7-8) aromatic	mg/kg	1.0	860	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC8-10) aromatic	mg/kg	1.0	47	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC10-12) aromatic	mg/kg	1.0	250	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC12-16) aromatic	mg/kg	1.0	1800	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC16-21) aromatic	mg/kg	1.0	1900	4.3	< 1.0	< 1.0	< 1.0	< 1.0	8.6	7.3	< 1.0	3
TPH (>EC21-35) aromatic	mg/kg	1.0	1900	18	< 1.0	< 1.0	< 1.0	< 1.0	45	60	< 1.0	13
TPH (>EC35-44) aromatic	mg/kg	1.0	1900	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatics (C5-C44)	mg/kg	5.0	nc	22	< 5.0	< 5.0	< 5.0	< 5.0	54	67	< 5.0	16
Total aliphatics & aromatics (C5-C	mg/kg	10	nc	22	< 10	< 10	< 10	< 10	54	67	< 10	16
BTEX												
Benzene	ug/kg	1.0	380	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1.0	880000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1.0	83000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m/p-Xylene	ug/kg	1.0	84000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	ug/kg	1.0	88000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
BTEX	ug/kg	5.0	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE												
MTBE	ug/kg	1.0	73000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOC												
Total Organic Carbon	%	0.2	nc	0.85	< 0.20	0.53	< 0.20	1.2	2.5	1.6	1.2	1.8
PAHs												
Naphthalene	mg/kg	0.1	2.3	< 0.10	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.12	<0.5	< 0.10
Acenaphthylene	mg/kg	0.1	2900	0.36	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.17	<0.5	< 0.10
Acenaphthene	mg/kg	0.1	3000	< 0.10	< 0.10	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10
Fluorene	mg/kg	0.1	2800	< 0.10	< 0.10	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10
Phenanthrene	mg/kg	0.1	1300	0.54	< 0.10	< 0.10	< 0.10	<0.5	<0.5	1.2	<0.5	0.35
Anthracene	mg/kg	0.1	31000	0.35	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.17	<0.5	< 0.10
Fluoranthene	mg/kg	0.1	1500	5.5	< 0.10	0.2	0.2	<0.5	<0.5	2.2	<0.5	0.84
Pyrene	mg/kg	0.1	3700	5.7	< 0.10	0.15	0.2	<0.5	<0.5	2	<0.5	0.72
Benzo(a)anthracene	mg/kg	0.1	11	3.2	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.81	<0.5	0.41
Chrysene	mg/kg	0.1	30	3.2	< 0.10	< 0.10	< 0.10	<0.5	<0.5	1.3	<0.5	0.64
Benzo(b)fluoranthene	mg/kg	0.1	3.9	3.5	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.95	<0.5	0.47
Benzo(k)fluoranthene	mg/kg	0.1	110	1.9	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.65	<0.5	0.37
Benzo(a)pyrene	mg/kg	0.1	3.2	3.9	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.89	<0.5	0.43
Indeno(123cd)pyrene	mg/kg	0.1	45	2.6	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.57	<0.5	0.24
Dibenzo(ah)anthracene	mg/kg	0.1	0.31	0.6	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.22	<0.5	< 0.10
Benzo(ghi)perylene	mg/kg	0.1	360	2.7	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.5	<0.5	0.24
Total 16 PAHs	mg/kg	2	nc	34	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	12	< 2.0	4.7
PCBs												
PCB 28	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	mg/kg	0.010	0.12	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB Total of 7 Congeners	mg/kg	0.10	0.23	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Heavy Metals												
Arsenic	mg/kg	1.0	40	23	19	20	23	23	17	23	35	19
Barium	mg/kg	10.0	1300	240	31	190	35	180	210	96	170	100
Cadmium	mg/kg	0.1	85	0.37	0.4	0.29	0.42	0.27	0.82	0.28	0.87	0.53
Chromium	mg/kg	1.0	910	14	9.7	19	9.8	19	24	17	27	15
Copper	mg/kg	0.5	7100	48	8.9	31	8.5	79	130	29	48	22
Mercury	mg/kg	0.1	56	1.3	0.13	0.28	0.1	0.38	0.54	0.22	0.31	0.28
Molybdenum	mg/kg	2.0	670	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	3.1	< 2.0
Nickel	mg/kg	0.5	180	19	16	25	18	27	32	25	33	22
Lead	mg/kg	0.5	310	560	12	330	18	140	89	79	72	270
Antimony	mg/kg	2.0	550	5.6	< 2.0	2.2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Selenium	mg/kg	0.2	430	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	mg/kg	0.5	40000	110	20	75	25	110	150	80	110	1300
pH - solid	pH units	0.10	nc	-	8.7	-	8.7	-	7.9	-	8	-
Asbestos Fibres in Soil												
ACM Type Detected	Presence	0.001	nc	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected

xx Exceedance - HH Soil. Residential without Plant

NOTES

MDL
-
nc No Criteria
TPH CWG Total Petroleum Hydrocarbons Criteria Working
NAD No Asbestos Detected

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 1

Sample Type			**HH Soil. Residential without Plant Uptake. Sandy Loam. TOC >=0.58 to <1.45%**	Soil	Soil	Soil	Soil	Soil
Sample ID				WS05	WS07	WS07	WS08	WS08
Sample Depth (m)				2.0 - 2.6	0.2 - 2.4	2.4 - 2.9	0.2 - 1.0	2.0 - 2.4
				Clay	Made Ground	Clay	Made Ground	Clay
Date Sampled				10/05/2017	10/05/2017	10/05/2017	10/05/2017	10/05/2017
Lab Reference				17-11825	17-11825	17-11825	17-11825	17-11825
Parameters	**Units**	**MDL**						
TPH CWG								
TPH Aliphatics								
TPH (>EC5-6) aliphatic	mg/kg	1.0	42	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC6-8) aliphatic	mg/kg	1.0	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC8-10) aliphatic	mg/kg	1.0	27	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC10-12) aliphatic	mg/kg	1.0	130	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC12-16) aliphatic	mg/kg	1.0	1100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC16-21) aliphatic	mg/kg	1.0	nc	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (EC21-35) aliphatic	mg/kg	1.0	nc	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (EC35-44) aliphatic	mg/kg	1.0	65000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatics (C5-C44)	mg/kg	5.0	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
TPH Aromatics								
TPH (>EC5-7) aromatic	mg/kg	1.0	370	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC7-8) aromatic	mg/kg	1.0	860	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC8-10) aromatic	mg/kg	1.0	47	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC10-12) aromatic	mg/kg	1.0	250	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC12-16) aromatic	mg/kg	1.0	1800	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC16-21) aromatic	mg/kg	1.0	1900	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC21-35) aromatic	mg/kg	1.0	1900	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (>EC35-44) aromatic	mg/kg	1.0	1900	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatics (C5-C44)	mg/kg	5.0	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total aliphatics & aromatics (C5-C	mg/kg	10	nc	< 10	< 10	< 10	< 10	< 10
BTEX								
Benzene	ug/kg	1.0	380	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1.0	880000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1.0	83000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m/p-Xylene	ug/kg	1.0	84000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	ug/kg	1.0	88000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
BTEX	ug/kg	5.0	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE								
MTBE	ug/kg	1.0	73000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOC								
Total Organic Carbon	%	0.2	nc	4.1	0.32	< 0.20	0.49	1.6
PAHs								
Naphthalene	mg/kg	0.1	2.3	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	mg/kg	0.1	2900	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	3000	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	2800	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	1300	< 0.10	0.52	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	31000	< 0.10	0.11	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	1500	< 0.10	0.93	< 0.10	0.19	< 0.10
Pyrene	mg/kg	0.1	3700	< 0.10	0.87	< 0.10	0.18	< 0.10
Benzo(a)anthracene	mg/kg	0.1	11	< 0.10	0.42	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.1	30	< 0.10	0.75	< 0.10	< 0.10	< 0.10
Benzo(b)fluoranthene	mg/kg	0.1	3.9	< 0.10	0.44	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	110	< 0.10	0.33	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	3.2	< 0.10	0.41	< 0.10	< 0.10	< 0.10
Indeno(123cd)pyrene	mg/kg	0.1	45	< 0.10	0.26	< 0.10	< 0.10	< 0.10
Dibenzo(ah)anthracene	mg/kg	0.1	0.31	< 0.10	0.12	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.1	360	< 0.10	0.33	< 0.10	< 0.10	< 0.10
Total 16 PAHs	mg/kg	2	nc	< 2.0	5.5	< 2.0	< 2.0	< 2.0
PCBs								
PCB 28	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	mg/kg	0.010	0.12	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	mg/kg	0.010	nc	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB Total of 7 Congeners	mg/kg	0.10	0.23	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Heavy Metals								
Arsenic	mg/kg	1.0	40	19	19	20	21	22
Barium	mg/kg	10.0	1300	180	120	24	170	180
Cadmium	mg/kg	0.1	85	1	0.21	0.31	0.27	0.53
Chromium	mg/kg	1.0	910	27	18	8.3	23	23
Copper	mg/kg	0.5	7100	94	21	6.9	35	54
Mercury	mg/kg	0.1	56	0.54	0.65	0.13	1.7	0.57
Molybdenum	mg/kg	2.0	670	2.4	< 2.0	< 2.0	< 2.0	< 2.0
Nickel	mg/kg	0.5	180	38	23	13	26	24
Lead	mg/kg	0.5	310	82	120	7.7	480	120
Antimony	mg/kg	2.0	550	< 2.0	2.4	< 2.0	< 2.0	< 2.0
Selenium	mg/kg	0.2	430	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	mg/kg	0.5	40000	310	83	20	120	110
pH - solid	pH units	0.10	nc	7.9	-	9	8.8	-
Asbestos Fibres in Soil								
ACM Type Detected	Presence	0.001	nc	-	No Asbestos Detected	-	No Asbestos Detected	-

xx	Exceedance - HH Soil. Residential without Plant

NOTES

MDL	
-	
nc	No Criteria
TPH CWG	Total Petroleum Hydrocarbons Criteria Working
NAD	No Asbestos Detected

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 2

Sample Type			**HH Soil. Residential without Plant Uptake. Sandy Loam. TOC >=0.58 to <1.45%**	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID				TP3	TP3	TP4	WS03	WS03	WS04
Sample Depth (m)				1.0	2.5	2.0	0.1 - 0.35	0.35 - 1.0	2.1 - 2.6
Date Sampled				10/05/2017	10/05/2017	09/05/2017	09/05/2017	09/05/2017	10/05/2017
Lab Reference				17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Parameters	**Units**	**MDL**							
VOCs									
Dichlorodifluoromethane	µg/kg	1.0	87000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	µg/kg	1.0	8.5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1.0	0.77	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	20	6800	< 20	< 20	< 20	< 20	< 20	< 20
Chloroethane	µg/kg	2.0	8400	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	µg/kg	1.0	23000000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1.0	230	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	µg/kg	1.0	190	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1.0	2500	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	µg/kg	1.0	120	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	µg/kg	5.0	150000	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	µg/kg	1.0	8.5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1.0	9000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1.0	8.5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1.0	nc	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	2.0	9.2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	µg/kg	1.0	17	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1.0	24	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1.0	24000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	5.0	290	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	µg/kg	10	nc	< 10	< 10	< 10	< 10	< 10	< 10
Trans-1,3-Dichloropropene	µg/kg	10	nc	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	µg/kg	10	880	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	µg/kg	1.0	180	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	2.0	1600000	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	µg/kg	10	8300	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	µg/kg	5.0	36	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	1.0	460	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	2.0	1500	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Styrene	µg/kg	1.0	35000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1.0	nc	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1.0	12000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1.0	910	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	µg/kg	50	5.1	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	µg/kg	1.0	40000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1.0	1600000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1.0	780000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1.0	1600000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	µg/kg	1.0	7800000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1.0	410	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	µg/kg	1.0	7800000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1.0	440	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	µg/kg	1.0	nc	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1.0	61000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	µg/kg	1.0	3900000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1.0	24000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	µg/kg	50	5.3	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	µg/kg	1.0	2600	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1.0	320	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	2.0	1500	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SVOCs									
N-Nitrosodimethylamine	mg/kg	0.50	0.002	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	mg/kg	0.50	440	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	mg/kg	0.50	390	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	mg/kg	0.50	0.23	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	mg/kg	0.50	0.44	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	mg/kg	0.50	61	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	mg/kg	0.50	24	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol	mg/kg	0.50	Use Cresol Total	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	mg/kg	0.50	3100	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	mg/kg	0.50	0.22	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	mg/kg	0.50	0.078	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	mg/kg	0.50	Use Cresol Total	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	mg/kg	0.50	5.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	mg/kg	0.50	570	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	mg/kg	0.50	nc	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	mg/kg	0.50	210	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	mg/kg	0.50	190	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	mg/kg	0.50	190	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	mg/kg	0.50	2.6	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	mg/kg	0.50	2.3	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	mg/kg	0.50	2.7	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	mg/kg	0.50	0.32	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	mg/kg	0.50	6300	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	mg/kg	0.50	240	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	mg/kg	0.50	nc	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	mg/kg	0.50	1.8	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	mg/kg	0.50	49	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	mg/kg	0.50	6300	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	mg/kg	0.50	3.8	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	mg/kg	0.50	630	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	mg/kg	0.50	2900	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	mg/kg	0.50	16.4	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	mg/kg	0.50	78	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	mg/kg	0.50	3000	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	mg/kg	0.50	nc	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	mg/kg	0.50	73	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	mg/kg	0.50	nc	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	mg/kg	0.50	170	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	mg/kg	0.50	2800	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	mg/kg	0.50	1800	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	mg/kg	0.50	27	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	mg/kg	0.50	nc	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	mg/kg	0.50	5.6	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	mg/kg	0.50	nc	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	mg/kg	0.50	4.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	mg/kg	0.50	27	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	mg/kg	0.50	1300	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	mg/kg	0.50	31000	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	mg/kg	0.50	nc	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	mg/kg	0.50	450	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	mg/kg	0.50	1500	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	mg/kg	0.50	3700	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	mg/kg	0.50	42000	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	mg/kg	0.50	11	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	mg/kg	0.50	30	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	mg/kg	0.50	2700	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	mg/kg	0.50	3400	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	mg/kg	0.50	3.9	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	mg/kg	0.50	110	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	mg/kg	0.50	3.2	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	mg/kg	0.50	45	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	mg/kg	0.50	0.31	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	mg/kg	0.50	360	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Does not exceed the screening criteria

xx Exceedance HH Soil. Residential without Plant Uptake

NOTES

MDL	Method Detection Limit
-	Not Analysed
nc	No Criteria

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 3

Sample Type			**CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal**	**CW/WE Water. Aquatic Toxicity - Ireland - Freshwater**	**CW/WE Water. GTV - Ireland**	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID						TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP6	TP6	WS01
Sample Depth (m)						0.5	2	1	2.5	0.5	2	0.5	1	3	0.1-0.7
						Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Clay	Made Ground	Made Ground	Made Ground	Made Ground
Date Sampled						09/05/2017	09/05/2017	10/05/2017	10/05/2017	09/05/2017	09/05/2017	09/05/2017	10/05/2017	10/05/2017	09/05/2017
Lab Reference						17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Parameters	**Units**	**MDL**													
Heavy Metal Leachates															
Arsenic	mg/kg	0.01	0.2	0.25	0.075	0.046	0.033	0.036	0.021	0.02	0.015	**0.11**	**0.1**	0.031	0.045
Barium	mg/kg	0.05	nc	1.0	1	0.05	0.11	<0.05	<0.05	0.43	<0.05	<0.05	0.11	0.12	0.093
Cadmium	mg/kg	0.0008	0.002	0.0008	0.0375	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Chromium	mg/kg	0.01	nc	0.047	0.375	<0.01	<0.01	0.068	<0.01	<0.01	0.022	0.018	0.031	<0.01	<0.01
Copper	mg/kg	0.01	0.05	0.05	15	0.015	0.012	0.02	0.021	0.013	0.017	0.093	0.096	0.026	0.03
Mercury	mg/kg	0.005	0.0007	0.0007	0.0075	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	mg/kg	0.01	nc	nc	0.7	0.025	0.092	0.052	0.08	0.13	0.017	0.065	0.03	0.026	0.016
Nickel	mg/kg	0.01	0.086	0.04	0.15	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	<0.01	0.011	<0.01	<0.01
Lead	mg/kg	0.01	0.013	0.012	0.075	<0.01	<0.01	<0.01	<0.01	0.035	<0.01	0.023	**0.15**	<0.01	<0.01
Antimony	mg/kg	0.01	nc	nc	0.05	0.022	0.036	0.013	0.011	**0.16**	0.01	**0.11**	**2.4**	**0.14**	0.039
Selenium	mg/kg	0.01	nc	nc	0.1	0.011	<0.01	0.011	0.011	<0.01	0.01	0.017	0.01	<0.01	<0.01
Zinc	mg/kg	0.01	0.4	0.08	0.75	0.012	<0.01	<0.01	<0.01	0.046	0.013	0.016	0.05	<0.01	<0.01
Other Leachates															
Total Phenols	mg/kg	0.3	nc	0.005	0.005	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Fluoride	mg/kg	1	15	5	8	1.7	1.5	1.2	1.2	1.5	1.5	2.8	1.7	1.2	2.6
Chloride	mg/kg	10	nc	2500	1875	14	18	16	16	14	29	17	41	17	15
Sulphate	mg/kg	10	nc	2000	1875	380	160	130	310	1300	96	170	130	40	34
Dissolved Organic Carbon	mg/kg	20	nc	nc	nc	100	110	100	100	71	81	100	100	96	61
Total Dissolved Solids (TDS)	mg/kg	10	nc	nc	nc	940	930	800	1200	2300	520	1600	1200	1100	1100

xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater
xx	Exceedance GTV - Ireland
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & Freshwater
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & GTV
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater & GTV
xx	Exceedance Aquatic Method Detection Limit

NOTES

MDL	Method Detection Limit
-	Not Analysed
nc	No Criteria

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 3

Sample Type			**CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal**	**CW/WE Water. Aquatic Toxicity - Ireland - Freshwater**	**CW/WE Water. GTV - Ireland**	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID						WS01	WS02	WS02	WS03	WS03	WS04	WS04	WS05	WS05	WS07
Sample Depth (m)						1.45 - 2.60	0.1 - 0.55	1.05 - 2.9	0.1 - 0.35	0.35 - 1.0	0.05 - 2.1	2.1 - 2.6	0.05 - 1.35	2.0 - 2.6	0.2 - 2.4
						Clay	Made Ground	Clay	Made Ground	Clay	Made Ground	Clay	Made Ground	Clay	Made Ground
Date Sampled						09/05/2017	09/05/2017	09/05/2017	09/05/2017	09/05/2017	10/05/2017	10/05/2017	10/05/2017	10/05/2017	10/05/2017
Lab Reference						17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Parameters	**Units**	**MDL**													
Heavy Metal Leachates															
Arsenic	mg/kg	0.01	0.2	0.25	0.075	<0.01	0.062	0.012	0.061	**0.092**	0.065	0.051	0.063	0.049	0.027
Barium	mg/kg	0.05	nc	1.0	1	<0.05	<0.05	<0.05	0.11	0.22	<0.05	<0.05	0.093	0.26	0.1
Cadmium	mg/kg	0.0008	0.002	0.0008	0.0375	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Chromium	mg/kg	0.01	nc	0.047	0.375	<0.01	<0.01	0.026	<0.01	<0.01	<0.01	<0.01	0.026	<0.01	0.022
Copper	mg/kg	0.01	0.05	0.05	15	0.015	0.017	<0.01	0.038	0.063	0.02	0.032	0.026	0.02	0.014
Mercury	mg/kg	0.005	0.0007	0.0007	0.0075	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	mg/kg	0.01	nc	nc	0.7	0.023	0.016	0.014	0.075	0.43	0.036	0.063	0.049	0.62	0.034
Nickel	mg/kg	0.01	0.086	0.04	0.15	<0.01	<0.01	<0.01	0.016	0.034	<0.01	<0.01	<0.01	0.03	<0.01
Lead	mg/kg	0.01	0.013	0.012	0.075	<0.01	<0.01	<0.01	<0.01	<0.01	0.014	<0.01	0.012	<0.01	<0.01
Antimony	mg/kg	0.01	nc	nc	0.05	<0.01	0.031	<0.01	**0.054**	0.036	<0.01	0.02	0.015	**0.06**	0.037
Selenium	mg/kg	0.01	nc	nc	0.1	0.013	<0.01	<0.01	<0.01	0.015	<0.01	0.013	0.011	0.01	<0.01
Zinc	mg/kg	0.01	0.4	0.08	0.75	<0.01	<0.01	<0.01	0.013	0.024	0.011	<0.01	0.012	0.033	<0.01
Other Leachates															
Total Phenols	mg/kg	0.3	nc	0.005	0.005	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Fluoride	mg/kg	1	15	5	8	1.5	1.4	1.4	1.2	1.3	1.8	1.4	2.1	1.4	2.1
Chloride	mg/kg	10	nc	2500	1875	27	26	16	21	130	19	20	32	49	< 10
Sulphate	mg/kg	10	nc	2000	1875	130	74	57	130	62	95	110	240	580	170
Dissolved Organic Carbon	mg/kg	20	nc	nc	nc	78	96	69	180	320	120	160	140	280	99
Total Dissolved Solids (TDS)	mg/kg	10	nc	nc	nc	810	1100	890	1900	2600	930	970	770	1800	680

xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater
xx	Exceedance GTV - Ireland
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & Freshwater
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & GTV
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater & GTV
xx	Exceedance Aquatic Method Detection Limit

NOTES

MDL	Method Detection Limit
-	Not Analysed
nc	No Criteria

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 3

Sample Type			**CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal**	**CW/WE Water. Aquatic Toxicity - Ireland - Freshwater**	**CW/WE Water. GTV - Ireland**	Soil	Soil	Soil
Sample ID						WS07	WS08	WS08
Sample Depth (m)						2.4 - 2.9	0.2 - 1.0	2.0 - 2.4
						Clay	Made Ground	Clay
Date Sampled						10/05/2017	10/05/2017	10/05/2017
Lab Reference						17-11825	17-11825	17-11825
Parameters	**Units**	**MDL**						
Heavy Metal Leachates								
Arsenic	mg/kg	0.01	0.2	0.25	0.075	0.014	0.027	0.022
Barium	mg/kg	0.05	nc	1.0	1	0.062	0.14	0.18
Cadmium	mg/kg	0.0008	0.002	0.0008	0.0375	<0.0008	<0.0008	<0.0008
Chromium	mg/kg	0.01	nc	0.047	0.375	<0.01	<0.01	<0.01
Copper	mg/kg	0.01	0.05	0.05	15	0.013	0.025	<0.01
Mercury	mg/kg	0.005	0.0007	0.0007	0.0075	0.0061	<0.005	0.023
Molybdenum	mg/kg	0.01	nc	nc	0.7	0.058	<0.01	0.32
Nickel	mg/kg	0.01	0.086	0.04	0.15	<0.01	<0.01	0.015
Lead	mg/kg	0.01	0.013	0.012	0.075	<0.01	0.042	<0.01
Antimony	mg/kg	0.01	nc	nc	0.05	0.027	0.012	0.033
Selenium	mg/kg	0.01	nc	nc	0.1	<0.01	<0.01	<0.01
Zinc	mg/kg	0.01	0.4	0.08	0.75	<0.01	<0.01	0.023
Other Leachates								
Total Phenols	mg/kg	0.3	nc	0.005	0.005	<0.3	<0.3	<0.3
Fluoride	mg/kg	1	15	5	8	2	1.7	1.2
Chloride	mg/kg	10	nc	2500	1875	18	16	66
Sulphate	mg/kg	10	nc	2000	1875	52	40	500
Dissolved Organic Carbon	mg/kg	20	nc	nc	nc	92	69	130
Total Dissolved Solids (TDS)	mg/kg	10	nc	nc	nc	700	610	1600

xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater
xx	Exceedance GTV - Ireland
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & Freshwater
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & GTV
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater & GTV
xx	Exceedance Aquatic Method Detection Limit

NOTES

MDL	Method Detection Limit
-	Not Analysed
nc	No Criteria

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 4

Sample Type			**CW/WE Water. Aquatic Toxicity - Ireland - Transitional / Coastal**	**CW/WE Water. Aquatic Toxicity - Ireland - Freshwater**	**CW/WE Water. GTV - Ireland**	**Groundwater Human Health GAC - Residential**	Groundwater	Groundwater	Groundwater
Sample ID							BH2	BH3	BH8
Sample Depth (m)							-	-	-
Date Sampled							17/05/2017	17/05/2017	17/05/2017
Lab Reference							17-12718	17-12718	17-12718
Parameters	**Units**	**MDL**							
Other Organics									
Biochemical Oxygen Demand	mg O2/l	4.0	nc	4	nc	nc	4	< 4.0	< 4.0
Chemical Oxygen Demand	mg O2/l	10	nc	nc	nc	nc	19	14	16
Inorganics									
Alkalinity (Total)	mg CaCO3/l	10	nc	nc	nc	nc	240	310	300
Chloride	mg/l	1.0	nc	250	187.5	250	22	14	21
Ammoniacal Nitrogen	mg/l	0.010	nc	nc	nc	nc	0.14	0.58	0.16
Nitrate	mg/l	0.50	nc	50	37.5	50	1.7	< 0.50	1.1
Sulphate	mg/l	1.0	nc	200	187.5	250	69	35	66
Calcium	mg/l	5.0	nc	nc	200	No path	110	78	110
Potassium	mg/l	0.50	nc	nc	5	nc	**5.2**	**15**	**5.1**
Magnesium	mg/l	0.50	nc	nc	50	No path	11	13	11
Sodium	mg/l	0.50	nc	nc	150	200	14	18	14
Metals									
Arsenic	µg/l	1.0	20	25	7.5	No path	1.2	4.4	1.5
Barium	µg/l	5.0	nc	100	100	No path	67	47	84
Cadmium	µg/l	0.080	0.2	0.08	3.75	No path	< 0.080	< 0.080	< 0.080
Chromium	µg/l	1.0	nc	nc	37.5	No path	< 1.0	< 1.0	< 1.0
Copper	µg/l	1.0	5	5	1500	No path	1.4	< 1.0	1.3
Mercury	µg/l	0.50	nc	nc	nc	nc	0.84	0.77	0.92
Molybdenum	µg/l	1.0	nc	nc	70	No path	2.3	4.7	2.5
Nickel	µg/l	1.0	8.6	4	15	No path	1.9	2.3	1.9
Lead	µg/l	1.0	1.3	1.2	7.5	No path	< 1.0	< 1.0	< 1.0
Antimony	µg/l	1.0	nc	nc	5	No path	1	< 1.0	< 1.0
Selenium	µg/l	1.0	nc	nc	10	No path	1.1	< 1.0	< 1.0
Zinc	µg/l	1.0	40	8	75	No path	4	3.8	3.3
TPH CWH									
TPH Aliphatics									
Aliphatic TPH >C5-C6	µg/l	0.10	nc	nc	15000	1900	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	µg/l	0.10	nc	nc	15000	1500	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	µg/l	0.10	nc	nc	300	57	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	µg/l	0.10	nc	nc	300	37	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	µg/l	0.10	nc	nc	300	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	µg/l	0.10	nc	nc	300	nc	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	µg/l	0.10	nc	nc	nc	nc	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	µg/l	0.10	nc	nc	300	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	µg/l	5.0	nc	nc	nc	nc	< 5.0	< 5.0	< 5.0
TPH Aromatics									
Aromatic TPH >C5-C7	µg/l	0.10	8	10	0.75	210000	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	µg/l	0.10	10	10	10	220000	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	µg/l	0.10	nc	nc	300	1900	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	µg/l	0.10	nc	nc	90	6800	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	µg/l	0.10	nc	nc	90	39000	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	µg/l	0.10	nc	nc	90	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	µg/l	0.10	nc	nc	90	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	µg/l	0.10	nc	nc	90	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	µg/l	5.0	nc	nc	nc	nc	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	µg/l	10	nc	nc	0.75	nc	< 10	< 10	< 10
PAHs									
Naphthalene	µg/l	0.10	2	2	0.075	220	< 0.10	< 0.10	< 0.10
Acenaphthylene	µg/l	0.10	nc	nc	18	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Acenaphthene	µg/l	0.10	nc	nc	18	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Fluorene	µg/l	0.10	nc	nc	12	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Phenanthrene	µg/l	0.10	nc	nc	4	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Anthracene	µg/l	0.10	0.1	0.1	0.075	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Fluoranthene	µg/l	0.10	0.0063	0.0063	1	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Pyrene	µg/l	0.10	nc	nc	9	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	µg/l	0.10	nc	nc	3.5	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Chrysene	µg/l	0.10	nc	nc	7	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	µg/l	0.10	nc	nc	0.075	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	µg/l	0.10	nc	nc	0.075	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	µg/l	0.10	0.00017	0.00017	0.0075	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	µg/l	0.10	nc	nc	0.075	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	µg/l	0.10	nc	nc	0.07	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	µg/l	0.10	nc	nc	0.075	Insufficiently volatile	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	µg/l	2.0	nc	nc	nc	nc	< 2.0	< 2.0	< 2.0
BTEX									
Benzene	µg/l	1.0	8	10	0.75	210	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1.0	10	10	525	230000	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1.0	20	10	10	10000	< 1.0	< 1.0	< 1.0
m & p-Xylene	µg/l	1.0	nc	nc	nc	nc	< 1.0	< 1.0	< 1.0
o-Xylene	µg/l	1.0	10	10	10	12000	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	µg/l	1.0	260	5100	10	83000	< 1.0	< 1.0	< 1.0
PCBs									
PCB 28	µg/l	0.010	nc	nc	nc	nc	< 0.010	< 0.010	< 0.010
PCB 52	µg/l	0.010	nc	nc	nc	nc	< 0.010	< 0.010	< 0.010
PCB 90+101	µg/l	0.010	nc	nc	nc	nc	< 0.010	< 0.010	< 0.010
PCB 118	µg/l	0.010	nc	nc	0.004	nc	< 0.010	< 0.010	< 0.010
PCB 153	µg/l	0.010	nc	nc	nc	nc	< 0.010	< 0.010	< 0.010
PCB 138	µg/l	0.010	nc	nc	nc	nc	< 0.010	< 0.010	< 0.010
PCB 180	µg/l	0.010	nc	nc	nc	nc	< 0.010	< 0.010	< 0.010
Total PCBs (7 congeners)	µg/l	0.010	nc	nc	0.044	nc	< 0.010	< 0.010	< 0.010

xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater
xx	Exceedance GTV - Ireland
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & Freshwater
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & GTV
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater & GTV
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & Freshwater & GTV
xx	Exceedance of Human Health - Residential

NOTES

MDL	Method Detection Limit
-	Not Analysed
nc	No Criteria
TPH CWG	Total Petroleum Hydrocarbons Criteria Working Group

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 4

Sample Type			**CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal**	**CW/WE Water. Aquatic Toxicity - Ireland - Freshwater**	**CW/WE Water. GTV - Ireland**	**Groundwater Human Health GAC - Residential**	Groundwater	Groundwater	Groundwater
Sample ID							BH2	BH3	BH8
Sample Depth (m)							-	-	-
Date Sampled							17/05/2017	17/05/2017	17/05/2017
Lab Reference							17-12718	17-12718	17-12718
Parameters	**Units**	**MDL**							
VOCs									
Dichlorodifluoromethane	µg/l	1.0	nc	nc	200	nc	< 1.0	< 1.0	< 1.0
Chloromethane	µg/l	1.0	nc	nc	190	14	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1.0	nc	nc	0.375	0.62	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	5.0	nc	nc	7.5	nc	< 5.0	< 5.0	< 5.0
Chloroethane	µg/l	2.0	nc	nc	21000	10000	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	µg/l	1.0	nc	nc	5200	nc	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1.0	nc	nc	30	160	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	µg/l	1.0	nc	nc	2.25	160	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1.0	nc	nc	2.8	2700	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	µg/l	1.0	nc	nc	2.25	130	< 1.0	< 1.0	< 1.0
Bromochloromethane	µg/l	5.0	nc	nc	83	nc	< 5.0	< 5.0	< 5.0
Trichloromethane	µg/l	1.0	2.5	2.5	75	790	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1.0	100	500	500	3000	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1.0	12	12	2	5.3	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1.0	nc	nc	nc	nc	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	2.0	10	10	2.25	8.9	< 2.0	< 2.0	< 2.0
Trichloroethene	µg/l	1.0	10	10	7.5	5.7	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1.0	nc	nc	40	22	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	10	nc	nc	8.3	nc	< 10	< 10	< 10
Bromodichloromethane	µg/l	5.0	nc	nc	75	17	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	µg/l	10	nc	nc	nc	nc	< 10	< 10	< 10
Trans-1,3-Dichloropropene	µg/l	10	nc	nc	nc	nc	< 10	< 10	< 10
1,1,2-Trichloroethane	µg/l	10	300	400	0.28	520	< 10	< 10	< 10
Tetrachloroethene	µg/l	1.0	10	10	7.5	34	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	2.0	nc	nc	370	nc	< 2.0	< 2.0	< 2.0
Dibromochloromethane	µg/l	10	nc	nc	75	100	< 10	< 10	< 10
1,2-Dibromoethane	µg/l	5.0	nc	nc	0.4	nc	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/l	1.0	25	1.5	1	98	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	2.0	nc	nc	0.57	240	< 2.0	< 2.0	< 2.0
Styrene	µg/l	1.0	50	50	20	8800	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1.0	nc	nc	nc	nc	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1.0	nc	nc	450	850	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1.0	nc	nc	62	220	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	µg/l	50	nc	nc	0.00075	nc	< 50	< 50	< 50
N-Propylbenzene	µg/l	1.0	nc	nc	660	2700	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1.0	nc	nc	240	nc	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1.0	nc	nc	120	nc	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1.0	nc	nc	250	nc	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	µg/l	1.0	nc	nc	690	nc	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1.0	nc	nc	15	24	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	µg/l	1.0	nc	nc	2000	nc	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1.0	nc	nc	nc	31	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	µg/l	1.0	nc	nc	nc	nc	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1.0	nc	nc	300	5000	< 1.0	< 1.0	< 1.0
N-Butylbenzene	µg/l	1.0	nc	nc	1000	nc	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1.0	nc	10	10	2000	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	µg/l	50	nc	nc	1	nc	< 50	< 50	< 50
1,2,4-Trichlorobenzene	µg/l	1.0	0.4	0.4	0.4	68	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1.0	0.6	0.6	0.1	1.7	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	2.0	0.4	0.4	0.1	35	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	µg/l	1.0	260	5100	10	83000	< 1.0	< 1.0	< 1.0
SVOCs									
N-Nitrosodimethylamine	µg/l	0.50	nc	nc	0.1	nc	< 0.50	< 0.50	< 0.50
Phenol	µg/l	0.50	8	8	5800	Insufficiently volatile	< 0.50	< 0.50	< 0.50
2-Chlorophenol	µg/l	0.50	50	50	200	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	µg/l	0.50	nc	nc	0.014	nc	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	µg/l	0.50	nc	nc	nc	31	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	µg/l	0.50	nc	nc	300	5000	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	µg/l	0.50	nc	10	10	2000	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	µg/l	0.50	nc	nc	1500	nc	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	µg/l	0.50	nc	nc	710	nc	< 0.50	< 0.50	< 0.50
Hexachloroethane	µg/l	0.50	nc	nc	0.33	8.5	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	µg/l	0.50	nc	nc	0.011	nc	< 0.50	< 0.50	< 0.50
4-Methylphenol	µg/l	0.50	nc	nc	1900	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Nitrobenzene	µg/l	0.50	nc	nc	10	nc	< 0.50	< 0.50	< 0.50
Isophorone	µg/l	0.50	nc	nc	78	nc	< 0.50	< 0.50	< 0.50
2-Nitrophenol	µg/l	0.50	nc	nc	nc	nc	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	µg/l	0.50	nc	nc	360	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	µg/l	0.50	nc	nc	59	nc	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	µg/l	0.50	0.42	4.2	46	Insufficiently volatile	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	µg/l	0.50	0.4	0.4	0.4	68	< 0.50	< 0.50	< 0.50
Naphthalene	µg/l	0.50	2	2	see PAHs (sum of 6)	220	< 0.50	< 0.50	< 0.50
4-Chloroaniline	µg/l	0.50	nc	nc	0.37	nc	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	µg/l	0.50	0.6	0.6	0.1	1.7	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	µg/l	0.50	40	40	1400	nc	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	µg/l	0.50	nc	nc	36	nc	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	µg/l	0.50	nc	nc	0.41	nc	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	µg/l	0.50	nc	nc	200	Insufficiently volatile	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	µg/l	0.50	nc	nc	1200	nc	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	µg/l	0.50	nc	nc	750	160	< 0.50	< 0.50	< 0.50
2-Nitroaniline	µg/l	0.50	nc	nc	190	nc	< 0.50	< 0.50	< 0.50
Acenaphthylene	µg/l	0.50	nc	nc	18	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Dimethylphthalate	µg/l	0.50	800	800	nc	nc	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	µg/l	0.50	nc	nc	0.049	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Acenaphthene	µg/l	0.50	nc	nc	18	Insufficiently volatile	< 0.50	< 0.50	< 0.50
3-Nitroaniline	µg/l	0.50	nc	nc	nc	nc	< 0.50	< 0.50	< 0.50
Dibenzofuran	µg/l	0.50	nc	nc	7.9	nc	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	µg/l	0.50	nc	nc	nc	nc	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	µg/l	0.50	nc	nc	0.24	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Fluorene	µg/l	0.50	nc	nc	12	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	µg/l	0.50	200	200	15000	Insufficiently volatile	< 0.50	< 0.50	< 0.50
4-Nitroaniline	µg/l	0.50	nc	nc	3.8	nc	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	µg/l	0.50	nc	nc	nc	nc	< 0.50	< 0.50	< 0.50
Azobenzene	µg/l	0.50	nc	nc	0.12	nc	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	µg/l	0.50	nc	nc	nc	nc	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	µg/l	0.50	0.05	0.05	0.03	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Pentachlorophenol	µg/l	0.50	0.4	0.4	2	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Phenanthrene	µg/l	0.50	nc	nc	4	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Anthracene	µg/l	0.50	0.1	0.1	0.075	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Carbazole	µg/l	0.50	nc	nc	nc	nc	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	µg/l	0.50	8	8	2	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Fluoranthene	µg/l	0.50	0.0063	0.0063	1	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Pyrene	µg/l	0.50	nc	nc	9	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	µg/l	0.50	0.75	7.5	16	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	µg/l	0.50	nc	nc	3.5	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Chrysene	µg/l	0.50	nc	nc	7	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	µg/l	0.50	1	1	6	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	µg/l	0.50	20	20	200	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	µg/l	0.50	see BaP and notes	see BaP and notes	see PAHs (sum of 6)	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	µg/l	0.50	see BaP and notes	see BaP and notes	0.075	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	µg/l	0.50	0.00017	0.00017	0.0075	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	µg/l	0.50	see BaP and notes	see BaP and notes	see PAHs (sum of 6)	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	µg/l	0.50	nc	nc	0.07	Insufficiently volatile	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	µg/l	0.50	see BaP and notes	see BaP and notes	see PAHs (sum of 6)	Insufficiently volatile	< 0.50	< 0.50	< 0.50
4-Nitrophenol	µg/l	0.50	nc	nc	nc	nc	< 0.50	< 0.50	< 0.50

xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater
xx	Exceedance GTV - Ireland
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & Freshwater
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & GTV
xx	Exceedance Aquatic Toxicity - Ireland - Freshwater & GTV
xx	Exceedance Aquatic Toxicity - Ireland - Transitional/Coastal & Freshwater & GTV
xx	Exceedance of Human Health - Residential

NOTES

MDL	Method Detection Limit
-	Not Analysed
nc	No Criteria

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 5

Sample Type						Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID						TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP6
Sample Depth (m)						0.5	2.0	1.0	2.5	0.5	2.0	0.5	1.0
						Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Clay	Made Ground	Made Ground
Date Sampled						09/05/2017	09/05/2017	10/05/2017	10/05/2017	09/05/2017	09/05/2017	09/05/2017	10/05/2017
Lab Reference						17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
						Category A Inert	**Category A Inert**	**Category A Inert**	**Category A Inert**	**Category C1 Non Hazardous**	**Category A Inert**	**Category C1 Non Hazardous**	**Category D1 Hazardous for Export**
Parameters	**Units**	**MDL**	**Inert Waste Criteria**	**MEHL Acceptance Criteria**	**Hazardous Criteria**								
Hydrocarbons													
TPH CWG													
Total aliphatics & aromatics (C5-C40)	mg/kg	10	nc	nc	See Haz Tool	< 10	< 10	< 10	< 10	< 10	71	< 10	73
BTEX													
Benzene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m/p-Xylene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
BTEX	ug/kg	5	6000	6000	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE													
MTBE	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOC													
Total Organic Carbon	%	0.2	3	3	nc	1.6	0.22	0.74	1.1	0.96	< 0.20	2.6	2.3
PAHs													
Naphthalene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10
Acenaphthylene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10
Fluorene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.49
Anthracene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	nc	nc	See Haz Tool	0.13	< 0.10	<0.5	<0.5	0.2	<0.5	< 0.10	1.6
Pyrene	mg/kg	0.1	nc	nc	See Haz Tool	0.12	< 0.10	<0.5	<0.5	0.18	<0.5	< 0.10	1.6
Benzo(a)anthracene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.85
Chrysene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	1.2
Benzo(b)fluoranthene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	1.1
Benzo(k)fluoranthene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.72
Benzo(a)pyrene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	1.2
Indeno(123cd)pyrene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.86
Dibenzo(ah)anthracene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.3
Benzo(ghi)perylene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	<0.5	<0.5	< 0.10	<0.5	< 0.10	0.81
Coronene	mg/kg		nc	nc	nc								
Total 6 PAHs (6)	mg/kg	0.1	2	nc	nc	0.13	<0.10	<0.10	<0.10	0.2	<0.10	<0.10	**6.29**
Total 17 PAHs (17)	mg/kg	2	nc	100	nc	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	11
Benzo(j)fluoranthene	mg/kg		nc	nc	See Haz Tool								
PCBs													
PCB Total of 7 Congeners	ug/kg	0.1	1000	1000	See Haz Tool	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Heavy Metals													
Arsenic	mg/kg	1	nc	nc	See Haz Tool	23	15	17	15	22	20	28	26
Barium	mg/kg	10	nc	nc	See Haz Tool	74	66	70	68	330	33	120	320
Cadmium	mg/kg	0.1	nc	nc	See Haz Tool	0.28	0.7	0.34	0.56	0.36	0.33	0.41	0.48
Chromium	mg/kg	1	nc	nc	See Haz Tool	13	16	14	14	18	9.7	19	19
Copper	mg/kg	0.5	nc	nc	See Haz Tool	25	18	25	28	31	11	65	47
Mercury	mg/kg	0.1	nc	nc	See Haz Tool	0.56	0.2	0.63	0.23	0.84	0.12	1.6	0.86
Molybdenum	mg/kg	2	nc	nc	See Haz Tool	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.2	< 2.0
Nickel	mg/kg	0.5	nc	nc	See Haz Tool	19	33	19	20	20	15	26	25
Lead	mg/kg	0.5	nc	nc	See Haz Tool	78	19	87	39	500	16	270	2600
Antimony	mg/kg	2	nc	nc	See Haz Tool	3.2	2	< 2.0	< 2.0	3	< 2.0	5.8	370
Selenium	mg/kg	0.2	nc	nc	See Haz Tool	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	mg/kg	0.5	nc	nc	See Haz Tool	51	39	42	54	160	22	150	320
Hexavalent Chromium	mg/kg		nc	nc	See Haz Tool	13	16	14	14	18	9.7	19	19
Chromium III	mg/kg		nc	nc	See Haz Tool	13	16	14	14	18	9.7	19	19
pH - solid	pH units		nc	nc	See Haz Tool	11.6	-	-	8.2	-	8.7	-	10.8
Asbestos Fibres in Soil													
ACM Type Detected	Presence	0.001	Presence	Presence	nc	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Heavy Metal Leachates													
Arsenic	mg/kg	0.01	0.5	0.5	nc	0.046	0.033	0.036	0.021	0.02	0.015	0.11	0.1
Barium	mg/kg	0.05	20	20	nc	0.05	0.11	<0.05	<0.05	0.43	<0.05	<0.05	0.11
Cadmium	mg/kg	0.0008	0.04	0.04	nc	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Chromium	mg/kg	0.01	0.5	0.5	nc	<0.01	<0.01	0.068	<0.01	<0.01	0.022	0.018	0.031
Copper	mg/kg	0.01	2	2	nc	0.015	0.012	0.02	0.021	0.013	0.017	0.093	0.096
Mercury	mg/kg	0.005	0.01	0.01	nc	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	mg/kg	0.01	0.5	0.5	nc	0.025	0.092	0.052	0.08	0.13	0.017	0.065	0.03
Nickel	mg/kg	0.01	0.4	0.4	nc	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	<0.01	0.011
Lead	mg/kg	0.01	0.5	0.5	nc	<0.01	<0.01	<0.01	<0.01	0.035	<0.01	0.023	0.15
Antimony	mg/kg	0.01	0.06	0.06	nc	0.022	0.036	0.013	0.011	**0.16**	0.01	**0.11**	**2.4**
Selenium	mg/kg	0.01	0.1	0.1	nc	0.011	<0.01	0.011	0.011	<0.01	0.01	0.017	0.01
Zinc	mg/kg	0.01	4	4	nc	0.012	<0.01	<0.01	<0.01	0.046	0.013	0.016	0.05
Other Leachates													
Total Phenols	mg/kg	0.3	1	1	nc	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Fluoride	mg/kg	1	10	10	nc	1.7	1.5	1.2	1.2	1.5	1.5	2.8	1.7
Chloride	mg/kg	10	800	800	nc	14	18	16	16	14	29	17	41
Sulphate	mg/kg	10	1000	1000	nc	380	160	130	310	**1300**	96	170	130
Dissolved Organic Carbon	mg/kg	20	500	500	nc	100	110	100	100	71	81	100	100
Total Dissolved Solids (TDS)	mg/kg	10	4000	4000	nc	940	930	800	1200	2300	520	1600	1200

Found not to be hazardous using the HazWasteOnline™ Application	xx	Does not exceed the Inert Waste Limit Values (2003/33/EC)
	xx	Exceeds Inert Waste Limit Values (2003/33/EC) but does not exceed the Murphy Environmental Hollywood Limited (MEHL) Acceptance Criteria (EPA Waste
	xx	Exceeds both the Inert Waste Limit Values (2003/33/EC) and the MEHL Acceptance Criteria but is not a hazardous waste
	xx	Exceeds both the Inert Waste Limit Values (2003/33/EC) and the MEHL Acceptance Criteria and contains non-hazardous levels of asbestos fibres but is
	xx	Found to be hazardous using the HazWasteOnline™ Application

MDL	Method Detection Limit
-	Not Analysed
nc	No Criteria
TPH CWG	Total Petroleum Hydrocarbons Criteria Working Group
NAD	No Asbestos Detected
ACM	Asbestos Containing Material

2003/33/EC Notes:
Note 1: If the waste exceeds the sulphate criterion, it may still be considered as complying with the acceptance criteria if the leaching does not exceed either of the following values: 1500 mg/kg as C0 at L/S = 0.1 l/kg and 6000mg/kg at L/S = 10 l/kg. It will be necessary to use a percolation test to determine the limit value at L/S = 0.1 l/kg under initial equilibrium conditions, whereas the value at L/S = 10 l/kg may be determined either by a batch leaching test or by a percolation test under conditions approaching local equilibrium.

Note 2: If the waste exceeds the value for dissolved organic carbon (DOC) at its own pH value, it may alternatively be tested at L/S = 10 l/kg and a pH between 7.5 and 8.0. The waste may be considered as complying with the acceptance criteria for DOC, if the result of this determination does not exceed 500 mg/kg. (A draft method based on prEN 14429 is available).
Note 3: The values for TDS (Total Dissolved Solids) can be used alternatively to the values for Sulphate and Chloride.
Note 4: The TOC limit value is complied with as long as the loss on ignition does not exceed 5% per weight. In the case of soils a higher limit value may be admitted by the Agency, provided the Dissolved Organic Carbon at pH 7 (DOC7) value of 500 mg/kg is achieved.

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 5

Sample Type						Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID						TP6	WS01	WS01	WS02	WS02	WS03	WS03	WS04
Sample Depth (m)						3.0	0.1-0.7	1.45 - 2.60	0.1 - 0.55	1.05 - 2.9	0.1 - 0.35	0.35 - 1.0	0.05 - 2.1
						Made Ground	Made Ground	Clay	Made Ground	Clay	Made Ground	Clay	Made Ground
Date Sampled						10/05/2017	09/05/2017	09/05/2017	09/05/2017	09/05/2017	09/05/2017	09/05/2017	10/05/2017
Lab Reference						17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
						Category C1 Non Hazardous	**Category B Inert**	**Category A Inert**	**Category A Inert**	**Category A Inert**	**Category A Inert**	**Category A Inert**	**Category B Inert**
Parameters	**Units**	**MDL**	**Inert Waste Criteria**	**MEHL Acceptance Criteria**	**Hazardous Criteria**								
Hydrocarbons													
TPH CWG													
Total aliphatics & aromatics (C5-C40)	mg/kg	10	nc	nc	See Haz Tool	< 10	22	< 10	< 10	< 10	< 10	54	67
BTEX													
Benzene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m/p-Xylene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
BTEX	ug/kg	5	6000	6000	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE													
MTBE	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOC													
Total Organic Carbon	%	0.2	3	3	nc	< 0.20	0.85	< 0.20	0.53	< 0.20	1.2	2.5	1.6
PAHs													
Naphthalene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.12
Acenaphthylene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	0.36	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.17
Acenaphthene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.5	<0.5	< 0.10
Fluorene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	<0.5	<0.5	< 0.10
Phenanthrene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	0.54	< 0.10	< 0.10	< 0.10	<0.5	<0.5	1.2
Anthracene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	0.35	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.17
Fluoranthene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	5.5	< 0.10	0.2	0.2	<0.5	<0.5	2.2
Pyrene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	5.7	< 0.10	0.15	0.2	<0.5	<0.5	2
Benzo(a)anthracene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	3.2	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.81
Chrysene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	3.2	< 0.10	< 0.10	< 0.10	<0.5	<0.5	1.3
Benzo(b)fluoranthene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	3.5	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.95
Benzo(k)fluoranthene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	1.9	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.65
Benzo(a)pyrene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	3.9	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.89
Indeno(123cd)pyrene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	2.6	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.57
Dibenzo(ah)anthracene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	0.6	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.22
Benzo(ghi)perylene	mg/kg	0.1	nc	nc	See Haz Tool	< 0.10	2.7	< 0.10	< 0.10	< 0.10	<0.5	<0.5	0.5
Coronene	mg/kg		nc	nc	nc								
Total 6 PAHs (6)	mg/kg	0.1	2	nc	nc	<0.10	**20.1**	<0.10	0.2	0.2	<0.10	<0.10	**5.76**
Total 17 PAHs (17)	mg/kg	2	nc	100	nc	< 2.0	34	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	12
Benzo(j)fluoranthene	mg/kg		nc	nc	See Haz Tool								
PCBs													
PCB Total of 7 Congeners	ug/kg	0.1	1000	1000	See Haz Tool	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Heavy Metals													
Arsenic	mg/kg	1	nc	nc	See Haz Tool	23	23	19	20	23	23	17	23
Barium	mg/kg	10	nc	nc	See Haz Tool	32	240	31	190	35	180	210	96
Cadmium	mg/kg	0.1	nc	nc	See Haz Tool	0.35	0.37	0.4	0.29	0.42	0.27	0.82	0.28
Chromium	mg/kg	1	nc	nc	See Haz Tool	8.4	14	9.7	19	9.8	19	24	17
Copper	mg/kg	0.5	nc	nc	See Haz Tool	8.9	48	8.9	31	8.5	79	130	29
Mercury	mg/kg	0.1	nc	nc	See Haz Tool	0.13	1.3	0.13	0.28	0.1	0.38	0.54	0.22
Molybdenum	mg/kg	2	nc	nc	See Haz Tool	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Nickel	mg/kg	0.5	nc	nc	See Haz Tool	13	19	16	25	18	27	32	25
Lead	mg/kg	0.5	nc	nc	See Haz Tool	24	560	12	330	18	140	89	79
Antimony	mg/kg	2	nc	nc	See Haz Tool	10	5.6	< 2.0	2.2	< 2.0	< 2.0	< 2.0	< 2.0
Selenium	mg/kg	0.2	nc	nc	See Haz Tool	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	mg/kg	0.5	nc	nc	See Haz Tool	21	110	20	75	25	110	150	80
Hexavalent Chromium	mg/kg		nc	nc	See Haz Tool	8.4	14	9.7	19	9.8	19	24	17
Chromium III	mg/kg		nc	nc	See Haz Tool	8.4	14	9.7	19	9.8	19	24	17
pH - solid	pH units		nc	nc	See Haz Tool	8.9	-	8.7	-	8.7	-	7.9	-
Asbestos Fibres in Soil													
ACM Type Detected	Presence	0.001	Presence	Presence	nc	No Asbestos Detected	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected
Heavy Metal Leachates													
Arsenic	mg/kg	0.01	0.5	0.5	nc	0.031	0.045	<0.01	0.062	0.012	0.061	0.092	0.065
Barium	mg/kg	0.05	20	20	nc	0.12	0.093	<0.05	<0.05	<0.05	0.11	0.22	<0.05
Cadmium	mg/kg	0.0008	0.04	0.04	nc	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Chromium	mg/kg	0.01	0.5	0.5	nc	<0.01	<0.01	<0.01	<0.01	0.026	<0.01	<0.01	<0.01
Copper	mg/kg	0.01	2	2	nc	0.026	0.03	0.015	0.017	<0.01	0.038	0.063	0.02
Mercury	mg/kg	0.005	0.01	0.01	nc	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	mg/kg	0.01	0.5	0.5	nc	0.026	0.016	0.023	0.016	0.014	0.075	0.43	0.036
Nickel	mg/kg	0.01	0.4	0.4	nc	<0.01	<0.01	<0.01	<0.01	<0.01	0.016	0.034	<0.01
Lead	mg/kg	0.01	0.5	0.5	nc	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.014
Antimony	mg/kg	0.01	0.06	0.06	nc	**0.14**	0.039	<0.01	0.031	<0.01	0.054	0.036	<0.01
Selenium	mg/kg	0.01	0.1	0.1	nc	<0.01	<0.01	0.013	<0.01	<0.01	<0.01	0.015	<0.01
Zinc	mg/kg	0.01	4	4	nc	<0.01	<0.01	<0.01	<0.01	<0.01	0.013	0.024	0.011
Other Leachates													
Total Phenols	mg/kg	0.3	1	1	nc	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Fluoride	mg/kg	1	10	10	nc	1.2	2.6	1.5	1.4	1.4	1.2	1.3	1.8
Chloride	mg/kg	10	800	800	nc	17	15	27	26	16	21	130	19
Sulphate	mg/kg	10	1000	1000	nc	40	34	130	74	57	130	62	95
Dissolved Organic Carbon	mg/kg	20	500	500	nc	96	61	78	96	69	180	320	120
Total Dissolved Solids (TDS)	mg/kg	10	4000	4000	nc	1100	1100	810	1100	890	1900	2600	930

Found not to be hazardous using the HazWasteOnline™ Application	xx	Does not exceed the Inert Waste Limit Values (2003/33/EC)
	xx	Exceeds Inert Waste Limit Values (2003/33/EC) but does not exceed the Murphy Environmental Hollywood Limited (MEHL) Acceptance Criteria (EPA Waste
	xx	Exceeds both the Inert Waste Limit Values (2003/33/EC) and the MEHL Acceptance Criteria but is not a hazardous waste
	xx	Exceeds both the Inert Waste Limit Values (2003/33/EC) and the MEHL Acceptance Criteria and contains non-hazardous levels of asbestos fibres but is
	xx	Found to be hazardous using the HazWasteOnline™ Application

MDL	Method Detection Limit
-	Not Analysed
nc	No Criteria
TPH CWG	Total Petroleum Hydrocarbons Criteria Working Group
NAD	No Asbestos Detected
ACM	Asbestos Containing Material

2003/33/EC Notes:
Note 1: If the waste exceeds the sulphate criterion, it may still be considered as complying with the acceptance criteria if the leaching does not exceed either of the following values: 1500 mg/kg as C0 at L/S = 0.1 l/kg and 6000mg/kg at L/S = 10 l/kg. It will be necessary to use a percolation test to determine the limit value at L/S = 0.1 l/kg under initial equilibrium conditions, whereas the value at L/S = 10 l/kg may be determined either by a batch leaching test or by a percolation test under conditions approaching local equilibrium.

Note 2: If the waste exceeds the value for dissolved organic carbon (DOC) at its own pH value, it may alternatively be tested at L/S = 10 l/kg and a pH between 7.5 and 8.0. The waste may be considered as complying with the acceptance criteria for DOC, if the result of this determination does not exceed 500 mg/kg. (A draft method based on prEN 14429 is available).
Note 3: The values for TDS (Total Dissolved Solids) can be used alternatively to the values for Sulphate and Chloride.
Note 4: The TOC limit value is complied with as long as the loss on ignition does not exceed 5% per weight. In the case of soils a higher limit value may be admitted by the Agency, provided the Dissolved Organic Carbon at pH 7 (DOC7) value of 500 mg/kg is achieved.

Client: Limerick City & County Council
Project: Project Opera
Location: Limerick
Job Number: 60533080
Appendix A: Table 5

Sample Type						Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID						WS04	WS05	WS05	WS07	WS07	WS08	WS08
Sample Depth (m)						2.1 - 2.6	0.05 - 1.35	2.0 - 2.6	0.2 - 2.4	2.4 - 2.9	0.2 - 1.0	2.0 - 2.4
						Clay	Made Ground	Clay	Made Ground	Clay	Made Ground	Clay
Date Sampled						10/05/2017	10/05/2017	10/05/2017	10/05/2017	10/05/2017	10/05/2017	10/05/2017
Lab Reference						17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
						Category A Inert	**Category D1 Hazardous for Export**	**Category C1 Non Hazardous**	**Category B Inert**	**Category A Inert**	**Category A Inert**	**Category C1 Non Hazardous**
Parameters	**Units**	**MDL**	**Inert Waste Criteria**	**MEHL Acceptance Criteria**	**Hazardous Criteria**							
Hydrocarbons												
TPH CWG												
Total aliphatics & aromatics (C5-C40)	mg/kg	10	nc	nc	See Haz Tool	< 10	16	< 10	< 10	< 10	< 10	< 10
BTEX												
Benzene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m/p-Xylene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
BTEX	ug/kg	5	6000	6000	nc	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE												
MTBE	ug/kg	1	nc	nc	See Haz Tool	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOC												
Total Organic Carbon	%	0.2	3	3	nc	1.2	1.8	**4.1**	0.32	< 0.20	0.49	1.6
PAHs												
Naphthalene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.35	< 0.10	0.52	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	< 0.10	< 0.10	0.11	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.84	< 0.10	0.93	< 0.10	0.19	< 0.10
Pyrene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.72	< 0.10	0.87	< 0.10	0.18	< 0.10
Benzo(a)anthracene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.41	< 0.10	0.42	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.64	< 0.10	0.75	< 0.10	< 0.10	< 0.10
Benzo(b)fluoranthene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.47	< 0.10	0.44	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.37	< 0.10	0.33	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.43	< 0.10	0.41	< 0.10	< 0.10	< 0.10
Indeno(123cd)pyrene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.24	< 0.10	0.26	< 0.10	< 0.10	< 0.10
Dibenzo(ah)anthracene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	< 0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.1	nc	nc	See Haz Tool	<0.5	0.24	< 0.10	0.33	< 0.10	< 0.10	< 0.10
Coronene	mg/kg		nc	nc	nc							
Total 6 PAHs (6)	mg/kg	0.1	2	nc	nc	<0.10	**2.59**	<0.10	**2.7**	<0.10	0.19	<0.10
Total 17 PAHs (17)	mg/kg	2	nc	100	nc	< 2.0	4.7	< 2.0	5.5	< 2.0	< 2.0	< 2.0
Benzo(j)fluoranthene	mg/kg		nc	nc	See Haz Tool							
PCBs												
PCB Total of 7 Congeners	ug/kg	0.1	1000	1000	See Haz Tool	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Heavy Metals												
Arsenic	mg/kg	1	nc	nc	See Haz Tool	35	19	19	19	20	21	22
Barium	mg/kg	10	nc	nc	See Haz Tool	170	100	180	120	24	170	180
Cadmium	mg/kg	0.1	nc	nc	See Haz Tool	0.87	0.53	1	0.21	0.31	0.27	0.53
Chromium	mg/kg	1	nc	nc	See Haz Tool	27	15	27	18	8.3	23	23
Copper	mg/kg	0.5	nc	nc	See Haz Tool	48	22	94	21	6.9	35	54
Mercury	mg/kg	0.1	nc	nc	See Haz Tool	0.31	0.28	0.54	0.65	0.13	1.7	0.57
Molybdenum	mg/kg	2	nc	nc	See Haz Tool	3.1	< 2.0	2.4	< 2.0	< 2.0	< 2.0	< 2.0
Nickel	mg/kg	0.5	nc	nc	See Haz Tool	33	22	38	23	13	26	24
Lead	mg/kg	0.5	nc	nc	See Haz Tool	72	270	82	120	7.7	480	120
Antimony	mg/kg	2	nc	nc	See Haz Tool	< 2.0	< 2.0	< 2.0	2.4	< 2.0	< 2.0	< 2.0
Selenium	mg/kg	0.2	nc	nc	See Haz Tool	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	mg/kg	0.5	nc	nc	See Haz Tool	110	1300	310	83	20	120	110
Hexavalent Chromium	mg/kg		nc	nc	See Haz Tool	27	15	27	18	8.3	23	23
Chromium III	mg/kg		nc	nc	See Haz Tool	27	15	27	18	8.3	23	23
pH - solid	pH units		nc	nc	See Haz Tool	8	-	7.9	-	9	8.8	-
Asbestos Fibres in Soil												
ACM Type Detected	Presence	0.001	Presence	Presence	nc	-	No Asbestos Detected	-	No Asbestos Detected	-	No Asbestos Detected	-
Heavy Metal Leachates												
Arsenic	mg/kg	0.01	0.5	0.5	nc	0.051	0.063	0.049	0.027	0.014	0.027	0.022
Barium	mg/kg	0.05	20	20	nc	<0.05	0.093	0.26	0.1	0.062	0.14	0.18
Cadmium	mg/kg	0.0008	0.04	0.04	nc	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Chromium	mg/kg	0.01	0.5	0.5	nc	<0.01	0.026	<0.01	0.022	<0.01	<0.01	<0.01
Copper	mg/kg	0.01	2	2	nc	0.032	0.026	0.02	0.014	0.013	0.025	<0.01
Mercury	mg/kg	0.005	0.01	0.01	nc	<0.005	<0.005	<0.005	<0.005	0.0061	<0.005	**0.023**
Molybdenum	mg/kg	0.01	0.5	0.5	nc	0.063	0.049	**0.62**	0.034	0.058	<0.01	0.32
Nickel	mg/kg	0.01	0.4	0.4	nc	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.015
Lead	mg/kg	0.01	0.5	0.5	nc	<0.01	0.012	<0.01	<0.01	<0.01	0.042	<0.01
Antimony	mg/kg	0.01	0.06	0.06	nc	0.02	0.015	0.06	0.037	0.027	0.012	0.033
Selenium	mg/kg	0.01	0.1	0.1	nc	0.013	0.011	0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/kg	0.01	4	4	nc	<0.01	0.012	0.033	<0.01	<0.01	<0.01	0.023
Other Leachates												
Total Phenols	mg/kg	0.3	1	1	nc	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Fluoride	mg/kg	1	10	10	nc	1.4	2.1	1.4	2.1	2	1.7	1.2
Chloride	mg/kg	10	800	800	nc	20	32	49	< 10	18	16	66
Sulphate	mg/kg	10	1000	1000	nc	110	240	580	170	52	40	500
Dissolved Organic Carbon	mg/kg	20	500	500	nc	160	140	280	99	92	69	130
Total Dissolved Solids (TDS)	mg/kg	10	4000	4000	nc	970	770	1800	680	700	610	1600

Found not to be hazardous using the HazWasteOnline™ Application	xx	Does not exceed the Inert Waste Limit Values (2003/33/EC)
	xx	Exceeds Inert Waste Limit Values (2003/33/EC) but does not exceed the Murphy Environmental Hollywood Limited (MEHL) Acceptance Criteria (EPA Waste
	xx	Exceeds both the Inert Waste Limit Values (2003/33/EC) and the MEHL Acceptance Criteria but is not a hazardous waste
	xx	Exceeds both the Inert Waste Limit Values (2003/33/EC) and the MEHL Acceptance Criteria and contains non-hazardous levels of asbestos fibres but is
	xx	Found to be hazardous using the HazWasteOnline™ Application

MDL	Method Detection Limit
-	Not Analysed
nc	No Criteria
TPH CWG	Total Petroleum Hydrocarbons Criteria Working Group
NAD	No Asbestos Detected
ACM	Asbestos Containing Material

2003/33/EC Notes:
Note 1: If the waste exceeds the sulphate criterion, it may still be considered as complying with the acceptance criteria if the leaching does not exceed either of the following values: 1500 mg/kg as C0 at L/S = 0.1 l/kg and 6000mg/kg at L/S = 10 l/kg. It will be necessary to use a percolation test to determine the limit value at L/S = 0.1 l/kg under initial equilibrium conditions, whereas the value at L/S = 10 l/kg may be determined either by a batch leaching test or by a percolation test under conditions approaching local equilibrium.

Note 2: If the waste exceeds the value for dissolved organic carbon (DOC) at its own pH value, it may alternatively be tested at L/S = 10 l/kg and a pH between 7.5 and 8.0. The waste may be considered as complying with the acceptance criteria for DOC, if the result of this determination does not exceed 500 mg/kg. (A draft method based on prEN 14429 is available).
Note 3: The values for TDS (Total Dissolved Solids) can be used alternatively to the values for Sulphate and Chloride.
Note 4: The TOC limit value is complied with as long as the loss on ignition does not exceed 5% per weight. In the case of soils a higher limit value may be admitted by the Agency, provided the Dissolved Organic Carbon at pH 7 (DOC7) value of 500 mg/kg is achieved.

Appendix B - Trial Pit Logs

Client: Limerick City Council..

Project: Project Opera SI River Abbey, Limerick City

Contract No: 0

AECOM

Record of Cable Percussion Borehole

TP2

Samples & in situ Tests				Water Level	Strata				
Depth	Type/ No.	Test Results	PID (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Visual/Olfactory Observations
0.00	B/TP2 0.5						(0.90)	MADE GROUND. Dark brown, loose, dry, silty, sandy, gravel with frequent cobbles. brick and builders rubble fragments throughout	
0.50	B/TP2 1.0		4.7						
							0.90		
1 1.00	B/TP2 1.5		3.5				1.10	White, dry CHALK layer approximately 200mm thick.	
							(0.70)	MADE GROUND. Dark brown, loose, dry, silty, sandy, gravel with frequent cobbles. brick and builders rubble fragments throughout	
1.50	B/TP2 2.0		4.3						
							1.80		
2 2.00	B/TP2 2.5		1.7				(0.80)	Brown - dark brown damp silty, sandy CLAY with occasional pebbles & cobbles. Getting progressively wetter and looser with increasing depth	
			0.5				2.60		
							(0.30)	Light brown, loose, very wet, muddy silty sandy GRAVEL. Some cobbles and occasional blobs of black mud/clay	
							2.90		
							2.91	EOH	
3								**End of Borehole at 2.91m**	

GENERAL REMARKS

EOH = End of hole
NEC = No sign of cantamination

Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Boring Progress and Water Observations

Date	Time	Hole Depth	Cas'g Depth	Cas'g Dia	Standing Level	Strike	Rise	Time (mins)	Sealed

Chiselling

From	To	Time (hr:min)

Water Added

From	To

Logged by: Stephen O'Sullivan 9/5/17
Checked by:
Status:

Equipment: Mini digger
Contractor: IGSL

Co-ordinates: Not Surveyed

Ground Level: Not Surveyed

Date: Start: 09/05/2017 End: 09/05/2017

AGS

Client: Limerick City Council..

Project: Project Opera SI River Abbey, Limerick City

Contract No: 0

AECOM

Record of Cable Percussion Borehole

TP3

Samples & in situ Tests				Water Level	Strata					
Depth	Type/ No.	Test Results	PID (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Visual/Olfactory Observations	
0.00	B/TP3 0.5						(0.30)	Tarmac/Hardcore		
							0.30			
0.50	B/TP3 1.0		10.3					MADE GROUND. Light brown, dry loose, silty, sandy gravel with frequent cobbles and very occasional boulders.		
1 1.00	B/TP3 1.5		56.7				(1.30)			
1.50	B/TP3 2.0		53.4				1.60			
2 2.00	B/TP3 2.5		38.7				(0.90)	MADE GROUND. Brown, slightly damp, silty sandy clayey gravel with darker clay rich units. Getting stiffer and more damp with increased depth		
			41.4				2.50			
							2.51	EOH. Unable to progress due to bedrock/large boulders		
3								**End of Borehole at 2.51m**		

GENERAL REMARKS	Boring Progress and Water Observations										Chiselling			Water Added	
EOH = End of hole NEC = No sign of cantamination	Date	Time	Hole Depth	Cas'g Depth	Cas'g Dia	Standing Level	Strike	Rise	Time (mins)	Sealed	From	To	Time (hr:min)	From	To

Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Logged by:	Equipment:	Co-ordinates:	Ground Level:	Date:	
Stephen O'Sullivan 10/5/17	Mini digger	Not Surveyed	Not Surveyed	Start: 10/05/2017	AGS
Checked by:	Contractor:			End: 10/05/2017	Sheet 1 of 1
Status:	IGSL				

Client: Limerick City Council..

Project: Project Opera SI River Abbey, Limerick City

Contract No: 0

AECOM

Record of Cable Percussion Borehole

TP4

Samples & in situ Tests				Water Level	Strata					
Depth	Type/ No.	Test Results	PID (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Visual/Olfactory Observations	
0.00	B/TP4 0.5						0.25	Reinforced concrete/hardcore		
0.50	B/TP4 1.0		0.8				(0.45) 0.70	MADE GROUND. Light brown, dry, sandy gravelly cobbles. Brick Fragments. pockets of black sandy gravel		
1 1.00	B/TP4 1.5		2.1				(0.60) 1.30	MADE GROUND. Black, slightly damp, silty, sandy, gravel with some cobbles. No odour/NEC		
1.50	B/TP4 2.0		1.1				(0.80) 2.10	Dark brown, slightly damp, firm, sandy, gravelly CLAY. Limestone cobbles		
2 2.00	B/TP4 2.5		67.7				(0.40) 2.50	Light brown, wet, loose, sandy, clayey, GRAVEL with frequent cobbles & occasional boulders		
			0.5				2.51	EOH. Sides caving in due to wet loose material **End of Borehole at 2.51m**		
3										

GENERAL REMARKS	Boring Progress and Water Observations										Chiselling			Water Added	
EOH = End of hole NEC = No sign of cantamination	Date	Time	Hole Depth	Cas'g Depth	Cas'g Dia	Standing Level	Strike	Rise	Time (mins)	Sealed	From	To	Time (hr:min)	From	To

Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Logged by:	Equipment:	Co-ordinates:	Ground Level:	Date:	
Stephen O'Sullivan 9/5/17	Mini digger	Not Surveyed	Not Surveyed	Start: 09/05/2017	AGS
Checked by:	Contractor:			End: 09/05/2017	
Status:	IGSL				Sheet 1 of 1

Client: Limerick City Council..

Project: Project Opera SI River Abbey, Limerick City

Contract No: 0

AECOM

Record of Cable Percussion Borehole

TP5

Samples & in situ Tests				Water Level	Strata					
Depth	Type/ No.	Test Results	PID (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Visual/Olfactory Observations	
0.00	B/TP5 0.5						0.20	Concrete		
								MADE GROUND. Dry black silty, sandy gravel with slate, brick and tile fragments. Frequent cobbles.Thin red layer (0.05m) at 0.8m - crushed brick.	
0.50	B/TP5 1.0		1.5				(0.80)			
1 1.00	B/TP5 1.5		2.1				1.00			
								MADE GROUND. Slightly damp, silty sandy clayey gravel. Brick fragments and cobbles		
							(0.65)			
1.50	B/TP5 2.0		3.6				1.65			
								MADE GROUND. Dark brown, wet, sandy gravelly clay. Some large boulders (~ 0.5m).		
2			0.7				(0.60)			
							2.25			
								Red/brownm stiff CLAY lens with some wet, loose grey sandy gravel		
							(0.30)			
							2.55			
							2.56	EOH. Water flow causing collapse		
								End of Borehole at 2.56m		
3										

GENERAL REMARKS	Boring Progress and Water Observations										Chiselling			Water Added	
EOH = End of hole NEC = No sign of cantamination	Date	Time	Hole Depth	Cas'g Depth	Cas'g Dia	Standing Level	Strike	Rise	Time (mins)	Sealed	From	To	Time (hr:min)	From	To

Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Logged by:	Equipment:	Co-ordinates:	Ground Level:	Date:	
Checked by:		Not Surveyed	Not Surveyed	Start: 09/05/2017	AGS
Status:	Contractor: IGSL			End: 09/05/2017	Sheet 1 of 1

Appendix C - Window Sample Borehole Logs

WINDOW SAMPLE RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick
PROBE NO.	**WS01**
SHEET	Sheet 1 of 1
CO-ORDINATES	
GROUND LEVEL (mOD)	
DATE DRILLED	09/05/2017
DATE LOGGED	09/05/2017
CLIENT	Limerick County Council
ENGINEER	Aecom
SAMPLED BY	JC / PF
LOGGED BY	JC

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	Concrete		0.10							
	Cobbles (possible old surface)		0.20							
	MADE GROUND comprising of brick,ash and clay									
	Soft grey black sandy SILT		0.80			0.00-1.00	90			
1.0	Firm brown sandy gravelly CLAY		1.10							
	Stiff brown sandy gravelly CLAY		1.50		1	1.00-2.00	100			
2.0						2.00-2.60	60			
	Obstruction Final Depth 2.60m		2.60							
3.0										
4.0										
5.0										

General Remarks
Pre-cored concrete slab and inspection pit excavated

Installations

WINDOW SAMPLE RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick
PROBE NO.	**WS02**
SHEET	Sheet 1 of 1
CO-ORDINATES	
GROUND LEVEL (mOD)	
DATE DRILLED	09/05/2017
DATE LOGGED	09/05/2017
CLIENT	Limerick County Council
ENGINEER	Aecom
SAMPLED BY	JC / PF
LOGGED BY	JC

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	Concrete		0.10							
	Cobbles (possible old surface)		0.30							
	MADE GROUND comprising of brick,ash and clay									
	Soft grey black sandy SILT		0.70							
	Firm to stiff grey brown sandy gravelly CLAY		0.90			0.00-1.00	60			
1.0										
						1.00-2.00	60			
2.0										
						2.00-2.90	40			
	Obstruction Final Depth 2.90m		2.90							
3.0										
4.0										
5.0										

General Remarks
Pre-cored concrete slab and inspection pit excavated

Installations

WINDOW SAMPLE RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick
PROBE NO.	**WS03**
SHEET	Sheet 1 of 1
CO-ORDINATES	
GROUND LEVEL (mOD)	
DATE DRILLED	09/05/2017
DATE LOGGED	09/05/2017
CLIENT	Limerick County Council
ENGINEER	Aecom
SAMPLED BY	JC / PF
LOGGED BY	JC

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	Concrete		0.10							
	MADE GROUND comprising of brick,ash and clay									
	Soft to Firm grey black sandy SILT		0.70			0.00-1.00	80			
1.0	Firm to stiff grey brown sandy gravelly CLAY		1.00		1	1.00-2.00	80			
2.0						2.00-3.00	85			
3.0						3.00-3.40	40			
	Obstruction Final Depth 3.40m		3.40							
4.0										
5.0										

General Remarks
Pre-cored concrete slab and inspection pit excavated

Installations

IGSL WS LOG 20088X.GPJ IGSL.GDT 17/5/17

WINDOW SAMPLE RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick	**PROBE NO.**	**WS05**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**DATE DRILLED**	10/05/2017
GROUND LEVEL (mOD)		**DATE LOGGED**	10/05/2017
CLIENT	Limerick County Council	**SAMPLED BY**	JC / PF
ENGINEER	Aecom	**LOGGED BY**	JC

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	Tarmacadam									
	MADE GROUND comprising of brick,ash and clay		0.50			0.00-1.00	75			
1.0										
						1.00-2.00	70			
2.0	Stiff to very stiff brown sandy gravelly CLAY		2.00							
						2.00-2.60	50			
	Obstruction Final Depth 2.60m		2.60							
3.0										
4.0										
5.0										

General Remarks

Installations

IGSL WS LOG 20088X.GPJ IGSL.GDT 17/5/17

WINDOW SAMPLE RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick
PROBE NO.	**WS07**
SHEET	Sheet 1 of 1
CO-ORDINATES	
GROUND LEVEL (mOD)	
DATE DRILLED	10/05/2017
DATE LOGGED	10/05/2017
CLIENT	Limerick County Council
ENGINEER	Aecom
SAMPLED BY	JC / PF
LOGGED BY	JC

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	Concrete		0.20							
	MADE GROUND comprising of brick,ash and clay					0.00-1.00	90			
1.0	Stiff to very stiff brown sandy gravelly CLAY		1.20			1.00-2.00	70			
2.0					1	2.00-2.60	60			
	Obstruction Final Depth 2.60m		2.60							
3.0										
4.0										
5.0										

General Remarks
Pre-cored concrete slab and inspection pit excavated

Installations

IGSL WS LOG 20088X.GPJ IGSL.GDT 17/5/17

WINDOW SAMPLE RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick
PROBE NO.	**WS08**
SHEET	Sheet 1 of 1
CO-ORDINATES	
GROUND LEVEL (mOD)	
DATE DRILLED	10/05/2017
DATE LOGGED	10/05/2017
CLIENT	Limerick County Council
ENGINEER	Aecom
SAMPLED BY	JC / PF
LOGGED BY	JC

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Blowcount	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	Concrete		0.22							
	MADE GROUND comprising of brick,ash and clay					0.00-1.00	90			
1.0	Firm brown sandy gravelly CLAY		1.20							
	Stiff to very stiff grey/blacklack sandy gravelly CLAY with cobbles		1.90		1	1.00-2.00	50			
2.0						2.00-2.40	40			
	Obstruction Final Depth 2.40m		2.40							
3.0										
4.0										
5.0										

General Remarks
Pre-cored concrete slab and inspection pit excavated

Installations

Appendix D - Groundwater Well Logs

GEOTECHNICAL BORING RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick	**BOREHOLE NO.**	**BH01**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	2.80
		DATE COMMENCED	09/05/2017
		DATE COMPLETED	09/05/2017
CLIENT	Limerick County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Aecom Ltd	**ENERGY RATIO (%)**	
		BORED BY	P.Thomas
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	CONCRETE			0.10						
	MADE GROUND (Comprised of black very sandy rubble fill)			1.10	AA66658	B	1.00		N = 11 (1, 2, 2, 2, 2, 5)	
1	Stiff to very stiff brown sandy gravelly CLAY with frequent cobbles and boulders									
2					AA66659	B	2.00		N = 31 (3, 5, 8, 5, 5, 13)	
					AA66660	B	2.50			
				2.80						
3	Obstruction End of Borehole at 2.80 m								N = 50/110 mm (11, 14, 31, 19)	
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
2.6	2.8	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.30	2.30	No	2.00	20	Slow

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
09-05-17	2.80	1.00	2.80	50mm SP

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Concrete slab pre-cored and Hand dug inspection pit excavated .

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 20088X.GPJ IGSL.GDT 17/5/17

GEOTECHNICAL BORING RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick	**BOREHOLE NO.**	**BH02**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2001
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	0.60
		DATE COMMENCED	08/05/2017
		DATE COMPLETED	08/05/2017
CLIENT	Limerick County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Aecom Ltd	**ENERGY RATIO (%)**	
		BORED BY	P.Thomas
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	CONCRETE			0.12						
	MADE GROUND (Comprised of clayey rubble fill with bricks)			0.60						
	Obstruction End of Borehole at 0.60 m									
1										
2										
3										
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS Concrete slab pre-cored and Hand dug inspection pit excavated. Refusal at 0.60m.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 20088X.GPJ IGSL.GDT 17/5/17

GEOTECHNICAL BORING RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick	**BOREHOLE NO.**	**BH02A**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	4.00
		DATE COMMENCED	08/05/2017
		DATE COMPLETED	08/05/2017
CLIENT	Limerick County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Aecom Ltd	**ENERGY RATIO (%)**	
		BORED BY	P.Thomas
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	CONCRETE			0.10						
	MADE GROUND (Comprised of brown very gravelly clay fill with cobbles and boulders)			1.00						
1	Soft to firm brown very sandy SILT/CLAY with occasional fine cobbles			1.80	AA66651	B	1.00		N = 5 (1, 0, 1, 1, 1, 2)	
2	Stiff to very stiff brown very gravelly CLAY with frequent cobbles				AA66652	B	2.00		N = 16 (1, 2, 2, 4, 4, 6)	
3					AA66653	B	3.00		N = 29 (3, 5, 6, 7, 7, 9)	
4	CONCRETE End of Borehole at 4.00 m			4.00	AA66654	B	4.00		N = 50/125 mm (6, 11, 27, 23)	
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
3.3	3.4	0.5	
3.8	4	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
08-05-17	4.00	1.00	4.00	50mm SP

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Concrete slab pre-cored and Hand dug inspection pit excavated.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 20088X.GPJ IGSL.GDT 17/5/17

GEOTECHNICAL BORING RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick	**BOREHOLE NO.**	**BH03**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	3.60
		DATE COMMENCED	09/05/2017
		DATE COMPLETED	09/05/2017
CLIENT	Limerick County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Aecom Ltd	**ENERGY RATIO (%)**	
		BORED BY	P.Thomas
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	CONCRETE			0.10						
	MADE GROUND (Comprised of dark browb very sandy clayey rubble fill)			1.10	AA66655	B	1.00		N = 11 (2, 2, 2, 3, 2, 4)	
1	Firm brown/grey sandy SILT/CLAY with some gravel			1.80						
	Stiff to very stiff brown gravelly CLAY with cobbles				AA66656	B	2.00		N = 20 (2, 4, 3, 4, 6, 7)	
2										
3					AA66657	B	3.00		N = 50/150 mm (10, 15, 25, 25)	
				3.60						
	Obstruction End of Borehole at 3.60 m									
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
3.3	3.6	2	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.60	2.60	No	2.00	20	Moderate

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
09-05-17	3.60	1.00	3.60	50mm SP

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Concrete slab pre-cored and Hand dug inspection pit excavated .

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 20088X.GPJ IGSL.GDT 17/5/17

GEOTECHNICAL BORING RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick	**BOREHOLE NO.**	**BH04**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	2.40
		DATE COMMENCED	10/05/2017
		DATE COMPLETED	10/05/2017
CLIENT	Limerick County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Aecom Ltd	**ENERGY RATIO (%)**	
		BORED BY	P.Thomas
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	TARMACADAM			0.10						
	MADE GROUND (Comprised of clayey rubble fill with brick and concrete)									
1					AA66665	B	1.00		N = 19 (3, 3, 5, 3, 5, 6)	
2					AA66666	B	2.00		N = 60/285 mm (2, 4, 5, 9, 25, 21)	
				2.40						
	Obstruction End of Borehole at 2.40 m									
3										
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
2.3	2.4	2	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
10-05-17	2.40	1.00	2.40	50mm SP

REMARKS Concrete slab pre-cored and Hand dug inspection pit excavated
.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 20088X.GPJ IGSL.GDT 17/5/17

GEOTECHNICAL BORING RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick	**BOREHOLE NO.**	**BH05**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	3.80
		DATE COMMENCED	11/05/2017
		DATE COMPLETED	11/05/2017
CLIENT	Limerick County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Aecom Ltd	**ENERGY RATIO (%)**	
		BORED BY	P.Thomas
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	TARMACADAM			0.10						
	MADE GROUND (Comprised of clayey rubble fill with bricks)									
1					AA66667	B	1.00		N = 8 (1, 2, 2, 1, 2, 3)	
2					AA66668	B	2.00		N = 14 (2, 2, 4, 4, 3, 3)	
				2.50						
	Stiff grey SILT with occasional gravel, cobbles and boulders									
3					AA66669	B	3.00		N = 25 (3, 3, 3, 5, 7, 10)	
					AA66670	B	3.50		N = 59/250 mm (9, 14, 18, 23, 9, 9)	
				3.80						
4	Obstruction End of Borehole at 3.80 m									
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
3.5	3.8	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.40	2.40	No	2.10	20	Slow

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
11-05-17	3.80	1.00	3.80	50mm SP

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Hand dug inspection pit .

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 20088X.GPJ IGSL.GDT 17/5/17

GEOTECHNICAL BORING RECORD

REPORT NUMBER 20088

CONTRACT	Project Opera - Bank Place , Limerick	**BOREHOLE NO.**	**BH08**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	3.60
		DATE COMMENCED	10/05/2017
		DATE COMPLETED	10/05/2017
CLIENT	Limerick County Council	**SPT HAMMER REF. NO.**	
ENGINEER	Aecom Ltd	**ENERGY RATIO (%)**	
		BORED BY	P.Thomas
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	CONCRETE			0.10						
	MADE GROUND (Comprised of brown clayey rubble fill)									
1					AA66661	B	1.00		N = 7 (2, 2, 2, 1, 2, 2)	
2				2.30	AA66662	B	2.00		N = 19 (1, 0, 1, 2, 6, 10)	
	Stiff to very stiff brown very gravelly SILT/CLAY with cobbles									
3				3.60	AA66663	B	3.00		N = 50/265 mm (2, 4, 4, 7, 18, 21)	
	Obstruction End of Borehole at 3.60 m									
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
2.8	3	0.75	
3.4	3.6	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
10-05-17	3.60	1.00	3.60	50mm SP

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Concrete slab pre-cored and Hand dug inspection pit excavated .

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 20088X.GPJ IGSL.GDT 17/5/17

Appendix E - SAL Laboratory Report - Soil

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

Final Report

Report No.:	17-11825-1
Initial Date of Issue:	18-May-2017
Client	IGSL
Client Address:	M7 Business Park Naas County Kildare Ireland
Contact(s):	Darren Keogh John Clancy
Project	Project Opera

Quotation No.:	Q17-09332	**Date Received:**	15-May-2017
Order No.:		**Date Instructed:**	15-May-2017
No. of Samples:	23		
Turnaround (Wkdays):	4	**Results Due:**	18-May-2017
Date Approved:	18-May-2017		

Approved By:

Details: Glynn Harvey, Laboratory Manager

Chemtest
The right chemistry to deliver results

Results - Leachate

Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452330	452333	452336	452339	452340	452343	452345	452349	452351
Order No.:					Client Sample Ref.:	TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP6	TP6
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.50	2.00	1.00	2.50	0.50	2.00	0.50	1.00	3.00
					Bottom Depth (m):									
					Date Sampled:	09-May-2017	09-May-2017	10-May-2017	10-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Total Dissolved Solids	N		mg/l	1.0		94	93	80	120	230	52	160	120	110
Chloride	U	1220	mg/l	1.0		1.4	1.8	1.6	1.6	1.4	2.9	1.7	4.1	1.7
Fluoride	U	1220	mg/l	0.050		0.17	0.15	0.12	0.12	0.15	0.15	0.28	0.17	0.12
Sulphate	U	1220	mg/l	1.0		38	16	13	31	130	9.6	17	13	4.0
Arsenic (Dissolved)	U	1450	µg/l	1.0		4.6	3.3	3.6	2.1	2.0	1.5	11	10	3.1
Barium (Dissolved)	U	1450	µg/l	5.0		5.0	11	< 5.0	< 5.0	43	< 5.0	< 5.0	11	12
Cadmium (Dissolved)	U	1450	µg/l	0.080		< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0		< 1.0	< 1.0	6.8	< 1.0	< 1.0	2.2	1.8	3.1	< 1.0
Copper (Dissolved)	U	1450	µg/l	1.0		1.5	1.2	2.0	2.1	1.3	1.7	9.3	9.6	2.6
Mercury (Dissolved)	U	1450	µg/l	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Molybdenum (Dissolved)	U	1450	µg/l	1.0		2.5	9.2	5.2	8.0	13	1.7	6.5	3.0	2.6
Nickel (Dissolved)	U	1450	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	1.6	< 1.0	< 1.0	1.1	< 1.0
Lead (Dissolved)	U	1450	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	3.5	< 1.0	2.3	15	< 1.0
Antimony (Dissolved)	U	1450	µg/l	1.0		2.2	3.6	1.3	1.1	16	1.0	11	240	14
Selenium (Dissolved)	U	1450	µg/l	1.0		1.1	< 1.0	1.1	1.1	< 1.0	1.0	1.7	1.0	< 1.0
Zinc (Dissolved)	U	1450	µg/l	1.0		1.2	< 1.0	< 1.0	< 1.0	4.6	1.3	1.6	5.0	< 1.0
Dissolved Organic Carbon	U	1610	mg/l	2.0		10	11	10	10	7.1	8.1	10	10	9.6
Total Phenols	U	1920	mg/l	0.030		< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Chemtest
The right chemistry to deliver results

Results - Leachate

Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452353	452356	452357	452359	452360	452361	452364	452365	452366
Order No.:					Client Sample Ref.:	BH01	BH01	BH02	BH02	BH03	BH03	BH04	BH04	BH05
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.10	1.45	0.10	1.05	0.10	0.35	0.05	2.10	0.05
					Bottom Depth (m):	0.70	2.60	0.55	2.90	0.35	1.00	2.10	2.60	1.35
					Date Sampled:	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017	10-May-2017
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Total Dissolved Solids	N		mg/l	1.0		110	81	110	89	190	260	93	97	77
Chloride	U	1220	mg/l	1.0		1.5	2.7	2.6	1.6	2.1	13	1.9	2.0	3.2
Fluoride	U	1220	mg/l	0.050		0.26	0.15	0.14	0.14	0.12	0.13	0.18	0.14	0.21
Sulphate	U	1220	mg/l	1.0		3.4	13	7.4	5.7	13	6.2	9.5	11	24
Arsenic (Dissolved)	U	1450	µg/l	1.0		4.5	< 1.0	6.2	1.2	6.1	9.2	6.5	5.1	6.3
Barium (Dissolved)	U	1450	µg/l	5.0		9.3	< 5.0	< 5.0	< 5.0	11	22	< 5.0	< 5.0	9.3
Cadmium (Dissolved)	U	1450	µg/l	0.080		< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0		< 1.0	< 1.0	< 1.0	2.6	< 1.0	< 1.0	< 1.0	< 1.0	2.6
Copper (Dissolved)	U	1450	µg/l	1.0		3.0	1.5	1.7	< 1.0	3.8	6.3	2.0	3.2	2.6
Mercury (Dissolved)	U	1450	µg/l	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Molybdenum (Dissolved)	U	1450	µg/l	1.0		1.6	2.3	1.6	1.4	7.5	43	3.6	6.3	4.9
Nickel (Dissolved)	U	1450	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	1.6	3.4	< 1.0	< 1.0	< 1.0
Lead (Dissolved)	U	1450	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.4	< 1.0	1.2
Antimony (Dissolved)	U	1450	µg/l	1.0		3.9	< 1.0	3.1	< 1.0	5.4	3.6	< 1.0	2.0	1.5
Selenium (Dissolved)	U	1450	µg/l	1.0		< 1.0	1.3	< 1.0	< 1.0	< 1.0	1.5	< 1.0	1.3	1.1
Zinc (Dissolved)	U	1450	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	1.3	2.4	1.1	< 1.0	1.2
Dissolved Organic Carbon	U	1610	mg/l	2.0		6.1	7.8	9.6	6.9	18	32	12	16	14
Total Phenols	U	1920	mg/l	0.030		< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Results - Leachate

Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452368	452369	452370	452371	452373
Order No.:					Client Sample Ref.:	BH05	BH07	BH07	BH08	BH08
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	2.00	0.20	2.40	0.20	2.00
					Bottom Depth (m):	2.60	2.40	2.90	1.00	2.40
					Date Sampled:	10-May-2017	10-May-2017	10-May-2017	10-May-2017	10-May-2017
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Total Dissolved Solids	N		mg/l	1.0		180	68	70	61	160
Chloride	U	1220	mg/l	1.0		4.9	< 1.0	1.8	1.6	6.6
Fluoride	U	1220	mg/l	0.050		0.14	0.21	0.20	0.17	0.12
Sulphate	U	1220	mg/l	1.0		58	17	5.2	4.0	50
Arsenic (Dissolved)	U	1450	µg/l	1.0		4.9	2.7	1.4	2.7	2.2
Barium (Dissolved)	U	1450	µg/l	5.0		26	10	6.2	14	18
Cadmium (Dissolved)	U	1450	µg/l	0.080		< 0.080	< 0.080	< 0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0		< 1.0	2.2	< 1.0	< 1.0	< 1.0
Copper (Dissolved)	U	1450	µg/l	1.0		2.0	1.4	1.3	2.5	< 1.0
Mercury (Dissolved)	U	1450	µg/l	0.50		< 0.50	< 0.50	0.61	< 0.50	2.3
Molybdenum (Dissolved)	U	1450	µg/l	1.0		62	3.4	5.8	< 1.0	32
Nickel (Dissolved)	U	1450	µg/l	1.0		3.0	< 1.0	< 1.0	< 1.0	1.5
Lead (Dissolved)	U	1450	µg/l	1.0		< 1.0	< 1.0	< 1.0	4.2	< 1.0
Antimony (Dissolved)	U	1450	µg/l	1.0		6.0	3.7	2.7	1.2	3.3
Selenium (Dissolved)	U	1450	µg/l	1.0		1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (Dissolved)	U	1450	µg/l	1.0		3.3	< 1.0	< 1.0	< 1.0	2.3
Dissolved Organic Carbon	U	1610	mg/l	2.0		28	9.9	9.2	6.9	13
Total Phenols	U	1920	mg/l	0.030		< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Chemtest
The right chemistry to deliver results

Results - Soil

Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452330	452333	452336	452339	452340	452343	452345	452349	452351
Order No.:					Client Sample Ref.:	TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP6	TP6
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.50	2.00	1.00	2.50	0.50	2.00	0.50	1.00	3.00
					Bottom Depth (m):									
					Date Sampled:	09-May-2017	09-May-2017	10-May-2017	10-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
ACM Type	U	2192		N/A		-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020		14	17	11	18	18	15	18	16	11
pH	M	2010		N/A		11.6			8.2		8.7		10.8	8.9
Arsenic	M	2450	mg/kg	1.0		23	15	17	15	22	20	28	26	23
Barium	M	2450	mg/kg	10		74	66	70	68	330	33	120	320	32
Cadmium	M	2450	mg/kg	0.10		0.28	0.70	0.34	0.56	0.36	0.33	0.41	0.48	0.35
Chromium	M	2450	mg/kg	1.0		13	16	14	14	18	9.7	19	19	8.4
Copper	M	2450	mg/kg	0.50		25	18	25	28	31	11	65	47	8.9
Mercury	M	2450	mg/kg	0.10		0.56	0.20	0.63	0.23	0.84	0.12	1.6	0.86	0.13
Molybdenum	M	2450	mg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.2	< 2.0	< 2.0
Nickel	M	2450	mg/kg	0.50		19	33	19	20	20	15	26	25	13
Lead	M	2450	mg/kg	0.50		78	19	87	39	500	16	270	2600	24
Antimony	N	2450	mg/kg	2.0		3.2	2.0	< 2.0	< 2.0	3.0	< 2.0	5.8	370	10
Selenium	M	2450	mg/kg	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	M	2450	mg/kg	0.50		51	39	42	54	160	22	150	320	21
Total Organic Carbon	M	2625	%	0.20		1.6	0.22	0.74	1.1	0.96	< 0.20	2.6	2.3	< 0.20
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	12	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	12	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	28	< 1.0	4.2	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	43	< 1.0	57	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	71	< 5.0	61	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		< 10	< 10	< 10	< 10	< 10	71	< 10	73	< 10
Naphthalene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	< 0.10	< 0.10

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Results - Soil

Project: Project Opera

Client: IGSL					Chemtest Job No.:	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					Chemtest Sample ID.:	452330	452333	452336	452339	452340	452343	452345	452349	452351
Order No.:					Client Sample Ref.:	TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP6	TP6
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.50	2.00	1.00	2.50	0.50	2.00	0.50	1.00	3.00
					Bottom Depth (m):									
					Date Sampled:	09-May-2017	09-May-2017	10-May-2017	10-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Acenaphthylene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	0.49	< 0.10
Anthracene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10		0.13	< 0.10			0.20		< 0.10	1.6	< 0.10
Pyrene	M	2700	mg/kg	0.10		0.12	< 0.10			0.18		< 0.10	1.6	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	0.85	< 0.10
Chrysene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	1.2	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	1.1	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	0.72	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	1.2	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	0.86	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	0.30	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10		< 0.10	< 0.10			< 0.10		< 0.10	0.81	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0		< 2.0	< 2.0			< 2.0		< 2.0	11	< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
Chloromethane	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
Vinyl Chloride	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
Bromomethane	M	2760	µg/kg	20				< 20	< 20		< 20			
Chloroethane	U	2760	µg/kg	2.0				< 2.0	< 2.0		< 2.0			
Trichlorofluoromethane	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
1,1-Dichloroethene	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
1,1-Dichloroethane	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
Bromochloromethane	U	2760	µg/kg	5.0				< 5.0	< 5.0		< 5.0			
Trichloromethane	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
1,1,1-Trichloroethane	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
Tetrachloromethane	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
1,1-Dichloropropene	U	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
Benzene	M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	M	2760	µg/kg	2.0				< 2.0	< 2.0		< 2.0			
Trichloroethene	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
1,2-Dichloropropane	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
Dibromomethane	M	2760	µg/kg	1.0				< 1.0	< 1.0		< 1.0			
Bromodichloromethane	M	2760	µg/kg	5.0				< 5.0	< 5.0		< 5.0			
cis-1,3-Dichloropropene	N	2760	µg/kg	10				< 10	< 10		< 10			

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Results - Soil

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		452330	452333	452336	452339	452340	452343	452345	452349	452351
Order No.:			Client Sample Ref.:		TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP6	TP6
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.50	2.00	1.00	2.50	0.50	2.00	0.50	1.00	3.00
			Bottom Depth (m):										
			Date Sampled:		09-May-2017	09-May-2017	10-May-2017	10-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10			< 10	< 10		< 10			
1,1,2-Trichloroethane	M	2760	µg/kg	10			< 10	< 10		< 10			
Tetrachloroethene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,3-Dichloropropane	U	2760	µg/kg	2.0			< 2.0	< 2.0		< 2.0			
Dibromochloromethane	U	2760	µg/kg	10			< 10	< 10		< 10			
1,2-Dibromoethane	M	2760	µg/kg	5.0			< 5.0	< 5.0		< 5.0			
Chlorobenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0			< 2.0	< 2.0		< 2.0			
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
Tribromomethane	U	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
Isopropylbenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
Bromobenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,2,3-Trichloropropane	N	2760	µg/kg	50			< 50	< 50		< 50			
N-Propylbenzene	U	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
2-Chlorotoluene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
4-Chlorotoluene	U	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
Tert-Butylbenzene	U	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
Sec-Butylbenzene	U	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,3-Dichlorobenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
4-Isopropyltoluene	U	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,4-Dichlorobenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
N-Butylbenzene	U	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,2-Dichlorobenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50			< 50	< 50		< 50			
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
Hexachlorobutadiene	U	2760	µg/kg	1.0			< 1.0	< 1.0		< 1.0			
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0			< 2.0	< 2.0		< 2.0			
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Phenol	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2-Chlorophenol	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Bis-(2-Chloroethyl)Ether	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			

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Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452330	452333	452336	452339	452340	452343	452345	452349	452351
Order No.:					Client Sample Ref.:	TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP6	TP6
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.50	2.00	1.00	2.50	0.50	2.00	0.50	1.00	3.00
					Bottom Depth (m):									
					Date Sampled:	09-May-2017	09-May-2017	10-May-2017	10-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
1,3-Dichlorobenzene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
1,4-Dichlorobenzene	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
1,2-Dichlorobenzene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2-Methylphenol	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Bis(2-Chloroisopropyl)Ether	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Hexachloroethane	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
N-Nitrosodi-n-propylamine	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
4-Methylphenol	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Nitrobenzene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Isophorone	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2-Nitrophenol	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2,4-Dimethylphenol	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Bis(2-Chloroethoxy)Methane	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2,4-Dichlorophenol	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
1,2,4-Trichlorobenzene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Naphthalene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
4-Chloroaniline	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Hexachlorobutadiene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
4-Chloro-3-Methylphenol	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2-Methylnaphthalene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
4-Nitrophenol	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2,4,6-Trichlorophenol	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2,4,5-Trichlorophenol	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2-Chloronaphthalene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2-Nitroaniline	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Acenaphthylene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Dimethylphthalate	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2,6-Dinitrotoluene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Acenaphthene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
3-Nitroaniline	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Dibenzofuran	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
4-Chlorophenylphenylether	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2,4-Dinitrotoluene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Fluorene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
Diethyl Phthalate	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
4-Nitroaniline	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50			

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Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452330	452333	452336	452339	452340	452343	452345	452349	452351
Order No.:					Client Sample Ref.:	TP2	TP2	TP3	TP3	TP4	TP4	TP5	TP6	TP6
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.50	2.00	1.00	2.50	0.50	2.00	0.50	1.00	3.00
					Bottom Depth (m):									
					Date Sampled:	09-May-2017	09-May-2017	10-May-2017	10-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Azobenzene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
4-Bromophenylphenyl Ether	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Hexachlorobenzene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Pentachlorophenol	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Phenanthrene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Anthracene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Carbazole	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Di-N-Butyl Phthalate	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Fluoranthene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Pyrene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Butylbenzyl Phthalate	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Benzo[a]anthracene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Chrysene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Di-N-Octyl Phthalate	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Benzo[b]fluoranthene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Benzo[k]fluoranthene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Benzo[a]pyrene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Indeno(1,2,3-c,d)Pyrene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Dibenz(a,h)Anthracene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
Benzo[g,h,i]perylene	M	2790	mg/kg	0.50			< 0.50	< 0.50		< 0.50				
PCB 28	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

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Project: Project Opera

Client: IGSL		**Chemtest Job No.:**			17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332		**Chemtest Sample ID.:**			452353	452356	452357	452359	452360	452361	452364	452365	452366
Order No.:		Client Sample Ref.:			BH01	BH01	BH02	BH02	BH03	BH03	BH04	BH04	BH05
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.10	1.45	0.10	1.05	0.10	0.35	0.05	2.10	0.05
		Bottom Depth (m):			0.70	2.60	0.55	2.90	0.35	1.00	2.10	2.60	1.35
		Date Sampled:			09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017	10-May-2017
		Asbestos Lab:			COVENTRY		COVENTRY		COVENTRY		COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-		-		-		-		-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected
Moisture	N	2030	%	0.020	16	11	14	8.2	14	24	13	24	15
pH	M	2010		N/A		8.7		8.7		7.9		8.0	
Arsenic	M	2450	mg/kg	1.0	23	19	20	23	23	17	23	35	19
Barium	M	2450	mg/kg	10	240	31	190	35	180	210	96	170	100
Cadmium	M	2450	mg/kg	0.10	0.37	0.40	0.29	0.42	0.27	0.82	0.28	0.87	0.53
Chromium	M	2450	mg/kg	1.0	14	9.7	19	9.8	19	24	17	27	15
Copper	M	2450	mg/kg	0.50	48	8.9	31	8.5	79	130	29	48	22
Mercury	M	2450	mg/kg	0.10	1.3	0.13	0.28	0.10	0.38	0.54	0.22	0.31	0.28
Molybdenum	M	2450	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	3.1	< 2.0
Nickel	M	2450	mg/kg	0.50	19	16	25	18	27	32	25	33	22
Lead	M	2450	mg/kg	0.50	560	12	330	18	140	89	79	72	270
Antimony	N	2450	mg/kg	2.0	5.6	< 2.0	2.2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	M	2450	mg/kg	0.50	110	20	75	25	110	150	80	110	1300
Total Organic Carbon	M	2625	%	0.20	0.85	< 0.20	0.53	< 0.20	1.2	2.5	1.6	1.2	1.8
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	4.3	< 1.0	< 1.0	< 1.0	< 1.0	8.6	7.3	< 1.0	3.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	18	< 1.0	< 1.0	< 1.0	< 1.0	45	60	< 1.0	13
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	22	< 5.0	< 5.0	< 5.0	< 5.0	54	67	< 5.0	16
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	22	< 10	< 10	< 10	< 10	54	67	< 10	16
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			0.12		< 0.10

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Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452353	452356	452357	452359	452360	452361	452364	452365	452366
Order No.:					Client Sample Ref.:	BH01	BH01	BH02	BH02	BH03	BH03	BH04	BH04	BH05
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.10	1.45	0.10	1.05	0.10	0.35	0.05	2.10	0.05
					Bottom Depth (m):	0.70	2.60	0.55	2.90	0.35	1.00	2.10	2.60	1.35
					Date Sampled:	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017	10-May-2017
					Asbestos Lab:	COVENTRY		COVENTRY		COVENTRY		COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Acenaphthylene	M	2700	mg/kg	0.10		0.36	< 0.10	< 0.10	< 0.10			0.17		< 0.10
Acenaphthene	M	2700	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10			< 0.10		< 0.10
Fluorene	M	2700	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10			< 0.10		< 0.10
Phenanthrene	M	2700	mg/kg	0.10		0.54	< 0.10	< 0.10	< 0.10			1.2		0.35
Anthracene	M	2700	mg/kg	0.10		0.35	< 0.10	< 0.10	< 0.10			0.17		< 0.10
Fluoranthene	M	2700	mg/kg	0.10		5.5	< 0.10	0.20	0.20			2.2		0.84
Pyrene	M	2700	mg/kg	0.10		5.7	< 0.10	0.15	0.20			2.0		0.72
Benzo[a]anthracene	M	2700	mg/kg	0.10		3.2	< 0.10	< 0.10	< 0.10			0.81		0.41
Chrysene	M	2700	mg/kg	0.10		3.2	< 0.10	< 0.10	< 0.10			1.3		0.64
Benzo[b]fluoranthene	M	2700	mg/kg	0.10		3.5	< 0.10	< 0.10	< 0.10			0.95		0.47
Benzo[k]fluoranthene	M	2700	mg/kg	0.10		1.9	< 0.10	< 0.10	< 0.10			0.65		0.37
Benzo[a]pyrene	M	2700	mg/kg	0.10		3.9	< 0.10	< 0.10	< 0.10			0.89		0.43
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10		2.6	< 0.10	< 0.10	< 0.10			0.57		0.24
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10		0.60	< 0.10	< 0.10	< 0.10			0.22		< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10		2.7	< 0.10	< 0.10	< 0.10			0.50		0.24
Total Of 16 PAH's	M	2700	mg/kg	2.0		34	< 2.0	< 2.0	< 2.0			12		4.7
Dichlorodifluoromethane	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Chloromethane	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Vinyl Chloride	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Bromomethane	M	2760	µg/kg	20						< 20	< 20		< 20	
Chloroethane	U	2760	µg/kg	2.0						< 2.0	< 2.0		< 2.0	
Trichlorofluoromethane	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,1-Dichloroethene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,1-Dichloroethane	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Bromochloromethane	U	2760	µg/kg	5.0						< 5.0	< 5.0		< 5.0	
Trichloromethane	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,1,1-Trichloroethane	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Tetrachloromethane	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,1-Dichloropropene	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Benzene	M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	M	2760	µg/kg	2.0						< 2.0	< 2.0		< 2.0	
Trichloroethene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,2-Dichloropropane	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Dibromomethane	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Bromodichloromethane	M	2760	µg/kg	5.0						< 5.0	< 5.0		< 5.0	
cis-1,3-Dichloropropene	N	2760	µg/kg	10						< 10	< 10		< 10	

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Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452353	452356	452357	452359	452360	452361	452364	452365	452366
Order No.:					Client Sample Ref.:	BH01	BH01	BH02	BH02	BH03	BH03	BH04	BH04	BH05
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.10	1.45	0.10	1.05	0.10	0.35	0.05	2.10	0.05
					Bottom Depth (m):	0.70	2.60	0.55	2.90	0.35	1.00	2.10	2.60	1.35
					Date Sampled:	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017	10-May-2017
					Asbestos Lab:	COVENTRY		COVENTRY		COVENTRY		COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Toluene	M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10						< 10	< 10		< 10	
1,1,2-Trichloroethane	M	2760	µg/kg	10						< 10	< 10		< 10	
Tetrachloroethene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,3-Dichloropropane	U	2760	µg/kg	2.0						< 2.0	< 2.0		< 2.0	
Dibromochloromethane	U	2760	µg/kg	10						< 10	< 10		< 10	
1,2-Dibromoethane	M	2760	µg/kg	5.0						< 5.0	< 5.0		< 5.0	
Chlorobenzene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0						< 2.0	< 2.0		< 2.0	
Ethylbenzene	M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Tribromomethane	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Isopropylbenzene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Bromobenzene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,2,3-Trichloropropane	N	2760	µg/kg	50						< 50	< 50		< 50	
N-Propylbenzene	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
2-Chlorotoluene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
4-Chlorotoluene	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Tert-Butylbenzene	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Sec-Butylbenzene	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,3-Dichlorobenzene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
4-Isopropyltoluene	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,4-Dichlorobenzene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
N-Butylbenzene	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,2-Dichlorobenzene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50						< 50	< 50		< 50	
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
Hexachlorobutadiene	U	2760	µg/kg	1.0						< 1.0	< 1.0		< 1.0	
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0						< 2.0	< 2.0		< 2.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Phenol	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2-Chlorophenol	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Bis-(2-Chloroethyl)Ether	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	

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Results - Soil

Project: Project Opera

Client: IGSL					Chemtest Job No.:	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					Chemtest Sample ID.:	452353	452356	452357	452359	452360	452361	452364	452365	452366
Order No.:					Client Sample Ref.:	BH01	BH01	BH02	BH02	BH03	BH03	BH04	BH04	BH05
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.10	1.45	0.10	1.05	0.10	0.35	0.05	2.10	0.05
					Bottom Depth (m):	0.70	2.60	0.55	2.90	0.35	1.00	2.10	2.60	1.35
					Date Sampled:	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017	10-May-2017
					Asbestos Lab:	COVENTRY		COVENTRY		COVENTRY		COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
1,3-Dichlorobenzene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
1,4-Dichlorobenzene	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
1,2-Dichlorobenzene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2-Methylphenol	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Bis(2-Chloroisopropyl)Ether	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Hexachloroethane	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
N-Nitrosodi-n-propylamine	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
4-Methylphenol	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Nitrobenzene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Isophorone	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2-Nitrophenol	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2,4-Dimethylphenol	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Bis(2-Chloroethoxy)Methane	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2,4-Dichlorophenol	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
1,2,4-Trichlorobenzene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Naphthalene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
4-Chloroaniline	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Hexachlorobutadiene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
4-Chloro-3-Methylphenol	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2-Methylnaphthalene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
4-Nitrophenol	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2,4,6-Trichlorophenol	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2,4,5-Trichlorophenol	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2-Chloronaphthalene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2-Nitroaniline	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Acenaphthylene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Dimethylphthalate	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2,6-Dinitrotoluene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Acenaphthene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
3-Nitroaniline	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Dibenzofuran	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
4-Chlorophenylphenylether	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2,4-Dinitrotoluene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Fluorene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Diethyl Phthalate	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
4-Nitroaniline	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	

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Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452353	452356	452357	452359	452360	452361	452364	452365	452366
Order No.:					Client Sample Ref.:	BH01	BH01	BH02	BH02	BH03	BH03	BH04	BH04	BH05
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.10	1.45	0.10	1.05	0.10	0.35	0.05	2.10	0.05
					Bottom Depth (m):	0.70	2.60	0.55	2.90	0.35	1.00	2.10	2.60	1.35
					Date Sampled:	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	09-May-2017	10-May-2017	10-May-2017	10-May-2017
					Asbestos Lab:	COVENTRY		COVENTRY		COVENTRY		COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Azobenzene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
4-Bromophenylphenyl Ether	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Hexachlorobenzene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Pentachlorophenol	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Phenanthrene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Anthracene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Carbazole	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Di-N-Butyl Phthalate	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Fluoranthene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Pyrene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Butylbenzyl Phthalate	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Benzo[a]anthracene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Chrysene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Di-N-Octyl Phthalate	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Benzo[b]fluoranthene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Benzo[k]fluoranthene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Benzo[a]pyrene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Indeno(1,2,3-c,d)Pyrene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Dibenz(a,h)Anthracene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
Benzo[g,h,i]perylene	M	2790	mg/kg	0.50						< 0.50	< 0.50		< 0.50	
PCB 28	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
PCB 52	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
PCB 90+101	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
PCB 118	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
PCB 153	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
PCB 138	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
PCB 180	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	

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Project: Project Opera

Client: IGSL					**Chemtest Job No.:**	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332					**Chemtest Sample ID.:**	452368	452369	452370	452371	452373
Order No.:					Client Sample Ref.:	BH05	BH07	BH07	BH08	BH08
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	2.00	0.20	2.40	0.20	2.00
					Bottom Depth (m):	2.60	2.40	2.90	1.00	2.40
					Date Sampled:	10-May-2017	10-May-2017	10-May-2017	10-May-2017	10-May-2017
					Asbestos Lab:		COVENTRY		COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A			-		-	
Asbestos Identification	U	2192	%	0.001			No Asbestos Detected		No Asbestos Detected	
Moisture	N	2030	%	0.020		39	12	8.4	24	28
pH	M	2010		N/A		7.9		9.0	8.8	
Arsenic	M	2450	mg/kg	1.0		19	19	20	21	22
Barium	M	2450	mg/kg	10		180	120	24	170	180
Cadmium	M	2450	mg/kg	0.10		1.0	0.21	0.31	0.27	0.53
Chromium	M	2450	mg/kg	1.0		27	18	8.3	23	23
Copper	M	2450	mg/kg	0.50		94	21	6.9	35	54
Mercury	M	2450	mg/kg	0.10		0.54	0.65	0.13	1.7	0.57
Molybdenum	M	2450	mg/kg	2.0		2.4	< 2.0	< 2.0	< 2.0	< 2.0
Nickel	M	2450	mg/kg	0.50		38	23	13	26	24
Lead	M	2450	mg/kg	0.50		82	120	7.7	480	120
Antimony	N	2450	mg/kg	2.0		< 2.0	2.4	< 2.0	< 2.0	< 2.0
Selenium	M	2450	mg/kg	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Zinc	M	2450	mg/kg	0.50		310	83	20	120	110
Total Organic Carbon	M	2625	%	0.20		4.1	0.32	< 0.20	0.49	1.6
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		< 10	< 10	< 10	< 10	< 10
Naphthalene	M	2700	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

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Results - Soil

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		452368	452369	452370	452371	452373
Order No.:			Client Sample Ref.:		BH05	BH07	BH07	BH08	BH08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		2.00	0.20	2.40	0.20	2.00
			Bottom Depth (m):		2.60	2.40	2.90	1.00	2.40
			Date Sampled:		10-May-2017	10-May-2017	10-May-2017	10-May-2017	10-May-2017
			Asbestos Lab:			COVENTRY		COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	0.52	< 0.10	< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	0.11	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	0.93	< 0.10	0.19	< 0.10
Pyrene	M	2700	mg/kg	0.10	< 0.10	0.87	< 0.10	0.18	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	0.42	< 0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	0.75	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	0.44	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	0.33	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	0.41	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	0.26	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	0.33	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	5.5	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0					
Chloromethane	M	2760	µg/kg	1.0					
Vinyl Chloride	M	2760	µg/kg	1.0					
Bromomethane	M	2760	µg/kg	20					
Chloroethane	U	2760	µg/kg	2.0					
Trichlorofluoromethane	M	2760	µg/kg	1.0					
1,1-Dichloroethene	M	2760	µg/kg	1.0					
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0					
1,1-Dichloroethane	M	2760	µg/kg	1.0					
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0					
Bromochloromethane	U	2760	µg/kg	5.0					
Trichloromethane	M	2760	µg/kg	1.0					
1,1,1-Trichloroethane	M	2760	µg/kg	1.0					
Tetrachloromethane	M	2760	µg/kg	1.0					
1,1-Dichloropropene	U	2760	µg/kg	1.0					
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	M	2760	µg/kg	2.0					
Trichloroethene	M	2760	µg/kg	1.0					
1,2-Dichloropropane	M	2760	µg/kg	1.0					
Dibromomethane	M	2760	µg/kg	1.0					
Bromodichloromethane	M	2760	µg/kg	5.0					
cis-1,3-Dichloropropene	N	2760	µg/kg	10					

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Results - Soil

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		452368	452369	452370	452371	452373
Order No.:			Client Sample Ref.:		BH05	BH07	BH07	BH08	BH08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		2.00	0.20	2.40	0.20	2.00
			Bottom Depth (m):		2.60	2.40	2.90	1.00	2.40
			Date Sampled:		10-May-2017	10-May-2017	10-May-2017	10-May-2017	10-May-2017
			Asbestos Lab:			COVENTRY		COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10					
1,1,2-Trichloroethane	M	2760	µg/kg	10					
Tetrachloroethene	M	2760	µg/kg	1.0					
1,3-Dichloropropane	U	2760	µg/kg	2.0					
Dibromochloromethane	U	2760	µg/kg	10					
1,2-Dibromoethane	M	2760	µg/kg	5.0					
Chlorobenzene	M	2760	µg/kg	1.0					
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0					
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	M	2760	µg/kg	1.0					
Tribromomethane	U	2760	µg/kg	1.0					
Isopropylbenzene	M	2760	µg/kg	1.0					
Bromobenzene	M	2760	µg/kg	1.0					
1,2,3-Trichloropropane	N	2760	µg/kg	50					
N-Propylbenzene	U	2760	µg/kg	1.0					
2-Chlorotoluene	M	2760	µg/kg	1.0					
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0					
4-Chlorotoluene	U	2760	µg/kg	1.0					
Tert-Butylbenzene	U	2760	µg/kg	1.0					
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0					
Sec-Butylbenzene	U	2760	µg/kg	1.0					
1,3-Dichlorobenzene	M	2760	µg/kg	1.0					
4-Isopropyltoluene	U	2760	µg/kg	1.0					
1,4-Dichlorobenzene	M	2760	µg/kg	1.0					
N-Butylbenzene	U	2760	µg/kg	1.0					
1,2-Dichlorobenzene	M	2760	µg/kg	1.0					
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50					
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0					
Hexachlorobutadiene	U	2760	µg/kg	1.0					
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0					
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	M	2790	mg/kg	0.50					
Phenol	M	2790	mg/kg	0.50					
2-Chlorophenol	M	2790	mg/kg	0.50					
Bis-(2-Chloroethyl)Ether	M	2790	mg/kg	0.50					

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Results - Soil

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		452368	452369	452370	452371	452373
Order No.:			Client Sample Ref.:		BH05	BH07	BH07	BH08	BH08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		2.00	0.20	2.40	0.20	2.00
			Bottom Depth (m):		2.60	2.40	2.90	1.00	2.40
			Date Sampled:		10-May-2017	10-May-2017	10-May-2017	10-May-2017	10-May-2017
			Asbestos Lab:			COVENTRY		COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
1,3-Dichlorobenzene	M	2790	mg/kg	0.50					
1,4-Dichlorobenzene	N	2790	mg/kg	0.50					
1,2-Dichlorobenzene	M	2790	mg/kg	0.50					
2-Methylphenol	M	2790	mg/kg	0.50					
Bis(2-Chloroisopropyl)Ether	M	2790	mg/kg	0.50					
Hexachloroethane	N	2790	mg/kg	0.50					
N-Nitrosodi-n-propylamine	M	2790	mg/kg	0.50					
4-Methylphenol	M	2790	mg/kg	0.50					
Nitrobenzene	M	2790	mg/kg	0.50					
Isophorone	M	2790	mg/kg	0.50					
2-Nitrophenol	N	2790	mg/kg	0.50					
2,4-Dimethylphenol	N	2790	mg/kg	0.50					
Bis(2-Chloroethoxy)Methane	M	2790	mg/kg	0.50					
2,4-Dichlorophenol	M	2790	mg/kg	0.50					
1,2,4-Trichlorobenzene	M	2790	mg/kg	0.50					
Naphthalene	M	2790	mg/kg	0.50					
4-Chloroaniline	N	2790	mg/kg	0.50					
Hexachlorobutadiene	M	2790	mg/kg	0.50					
4-Chloro-3-Methylphenol	M	2790	mg/kg	0.50					
2-Methylnaphthalene	M	2790	mg/kg	0.50					
4-Nitrophenol	N	2790	mg/kg	0.50					
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50					
2,4,6-Trichlorophenol	M	2790	mg/kg	0.50					
2,4,5-Trichlorophenol	M	2790	mg/kg	0.50					
2-Chloronaphthalene	M	2790	mg/kg	0.50					
2-Nitroaniline	M	2790	mg/kg	0.50					
Acenaphthylene	M	2790	mg/kg	0.50					
Dimethylphthalate	M	2790	mg/kg	0.50					
2,6-Dinitrotoluene	M	2790	mg/kg	0.50					
Acenaphthene	M	2790	mg/kg	0.50					
3-Nitroaniline	N	2790	mg/kg	0.50					
Dibenzofuran	M	2790	mg/kg	0.50					
4-Chlorophenylphenylether	M	2790	mg/kg	0.50					
2,4-Dinitrotoluene	M	2790	mg/kg	0.50					
Fluorene	M	2790	mg/kg	0.50					
Diethyl Phthalate	M	2790	mg/kg	0.50					
4-Nitroaniline	M	2790	mg/kg	0.50					
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50					

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Results - Soil

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-11825	17-11825	17-11825	17-11825	17-11825
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		452368	452369	452370	452371	452373
Order No.:			Client Sample Ref.:		BH05	BH07	BH07	BH08	BH08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		2.00	0.20	2.40	0.20	2.00
			Bottom Depth (m):		2.60	2.40	2.90	1.00	2.40
			Date Sampled:		10-May-2017	10-May-2017	10-May-2017	10-May-2017	10-May-2017
			Asbestos Lab:			COVENTRY		COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Azobenzene	M	2790	mg/kg	0.50					
4-Bromophenylphenyl Ether	M	2790	mg/kg	0.50					
Hexachlorobenzene	M	2790	mg/kg	0.50					
Pentachlorophenol	N	2790	mg/kg	0.50					
Phenanthrene	M	2790	mg/kg	0.50					
Anthracene	M	2790	mg/kg	0.50					
Carbazole	M	2790	mg/kg	0.50					
Di-N-Butyl Phthalate	M	2790	mg/kg	0.50					
Fluoranthene	M	2790	mg/kg	0.50					
Pyrene	M	2790	mg/kg	0.50					
Butylbenzyl Phthalate	M	2790	mg/kg	0.50					
Benzo[a]anthracene	M	2790	mg/kg	0.50					
Chrysene	M	2790	mg/kg	0.50					
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50					
Di-N-Octyl Phthalate	M	2790	mg/kg	0.50					
Benzo[b]fluoranthene	M	2790	mg/kg	0.50					
Benzo[k]fluoranthene	M	2790	mg/kg	0.50					
Benzo[a]pyrene	M	2790	mg/kg	0.50					
Indeno(1,2,3-c,d)Pyrene	M	2790	mg/kg	0.50					
Dibenz(a,h)Anthracene	M	2790	mg/kg	0.50					
Benzo[g,h,i]perylene	M	2790	mg/kg	0.50					
PCB 28	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	M	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

Appendix F - SAL Laboratory Report - Groundwater

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

UKAS TESTING
2183

Final Report

Report No.:	17-12718-1
Initial Date of Issue:	06-Jun-2017
Client	IGSL
Client Address:	M7 Business Park Naas County Kildare Ireland
Contact(s):	Darren Keogh John Clancy
Project	Project Opera
Quotation No.:	Q17-09332
Order No.:	
No. of Samples:	3
Turnaround (Wkdays):	8
Date Approved:	06-Jun-2017
Approved By:	

Date Received:	23-May-2017
Date Instructed:	25-May-2017
Results Due:	06-Jun-2017

Details: Robert Monk, Technical Development Chemist

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Results - Water

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-12718	17-12718	17-12718
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		456380	456381	456382
			Client Sample ID.:		BH2	BH3	BH8
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		17-May-2017	17-May-2017	17-May-2017
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Biochemical Oxygen Demand	N	1090	mg O2/l	4.0	[B] 4.0	[B] < 4.0	[B] < 4.0
Chemical Oxygen Demand	U	1100	mg O2/l	10	19	14	16
Alkalinity (Total)	U	1220	mg CaCO3/l	10	240	310	300
Chloride	U	1220	mg/l	1.0	22	14	21
Ammoniacal Nitrogen	U	1220	mg/l	0.010	0.14	0.58	0.16
Nitrate	U	1220	mg/l	0.50	1.7	< 0.50	1.1
Sulphate	U	1220	mg/l	1.0	69	35	66
Calcium	U	1415	mg/l	5.0	110	78	110
Potassium	U	1415	mg/l	0.50	5.2	15	5.1
Magnesium	U	1415	mg/l	0.50	11	13	11
Sodium	U	1415	mg/l	0.50	14	18	14
Arsenic (Dissolved)	U	1450	µg/l	1.0	1.2	4.4	1.5
Barium (Dissolved)	U	1450	µg/l	5.0	67	47	84
Cadmium (Dissolved)	U	1450	µg/l	0.080	< 0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0
Copper (Dissolved)	U	1450	µg/l	1.0	1.4	< 1.0	1.3
Mercury (Dissolved)	U	1450	µg/l	0.50	0.84	0.77	0.92
Molybdenum (Dissolved)	U	1450	µg/l	1.0	2.3	4.7	2.5
Nickel (Dissolved)	U	1450	µg/l	1.0	1.9	2.3	1.9
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0
Antimony (Dissolved)	U	1450	µg/l	1.0	1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0	1.1	< 1.0	< 1.0
Zinc (Dissolved)	U	1450	µg/l	1.0	4.0	3.8	3.3
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10

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Results - Water

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-12718	17-12718	17-12718
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		456380	456381	456382
			Client Sample ID.:		BH2	BH3	BH8
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		17-May-2017	17-May-2017	17-May-2017
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10	< 10	< 10
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	1700	µg/l	2.0	< 2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10

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Results - Water

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-12718	17-12718	17-12718
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		456380	456381	456382
			Client Sample ID.:		BH2	BH3	BH8
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		17-May-2017	17-May-2017	17-May-2017
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50

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Results - Water

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-12718	17-12718	17-12718
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		456380	456381	456382
			Client Sample ID.:		BH2	BH3	BH8
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		17-May-2017	17-May-2017	17-May-2017
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50

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Results - Water

Project: Project Opera

Client: IGSL			**Chemtest Job No.:**		17-12718	17-12718	17-12718
Quotation No.: Q17-09332			**Chemtest Sample ID.:**		456380	456381	456382
			Client Sample ID.:		BH2	BH3	BH8
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		17-May-2017	17-May-2017	17-May-2017
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
PCB 28	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 52	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 118	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 153	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 138	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 180	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 congeners)	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample ID:	Sample Ref:	Sample ID:	Sampled Date:	Deviation Code(s):	Containers Received:
456380		BH2	17-May-2017	B	Coloured Winchester 500ml
456380		BH2	17-May-2017	B	EPA Vial 40ml
456380		BH2	17-May-2017	B	Plastic Bottle 1000ml
456381		BH3	17-May-2017	B	Coloured Winchester 500ml
456381		BH3	17-May-2017	B	EPA Vial 40ml
456381		BH3	17-May-2017	B	Plastic Bottle 1000ml
456382		BH8	17-May-2017	B	Coloured Winchester 500ml
456382		BH8	17-May-2017	B	EPA Vial 40ml
456382		BH8	17-May-2017	B	Plastic Bottle 1000ml

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Test Methods

SOP	Title	Parameters included	Method summary
1090	Biochemical Oxygen Demand	Biochemical Oxygen demand (BOD)	Electrometric determination of dissolved oxygen in seeded sample initially and after 5 days incubation at 20°C.
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Waters by GC-MS	ICES7 PCB congeners	Solvent extraction / GCMS detection

Chemtest
The right chemistry to deliver results

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

Appendix G - HazWasteOnline™ Classification Reports

AECOM

HazWasteOnline™

Waste Classification Report

N2484-CSSSK-9K53Q

Job name

Project Opera Soil Waste Classification

Description/Comments

Project

Site

Project Opera

Waste Stream Template

WM3 2017

Classified by

Name:
Matteo Viganotti
Date:
09/06/2017 15:54:08 UTC
Telephone:
353 1 4155100

Company:
AECOM Ireland Limited
4th Floor, Adelphi Plaza, Adelphi Centre
George's Street Upper
Dun Laoghaire

Report

Created by: Matteo Viganotti
Created date: 09/06/2017 15:54 UTC

Job summary

Classification of sample: TP2 0.5 m

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:	LoW Code:	
TP2 0.5 m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.5 m	Entry:	17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

Risk phrases hit:

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 11.6 pH)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
8		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
9		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
10		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
11		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
12		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
13		fluoranthene		205-912-4	206-44-0		0.13	mg/kg		0.13	mg/kg	0.000013 %		
14		pyrene		204-927-3	129-00-0		0.12	mg/kg		0.12	mg/kg	0.000012 %		
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
16		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
20		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3.2	mg/kg	1.197	3.831	mg/kg	0.000383 %		
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		23	mg/kg	1.32	30.367	mg/kg	0.00304 %		
26		barium { barium oxide }		215-127-9	1304-28-5		74	mg/kg	1.117	82.621	mg/kg	0.00826 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		0.28	mg/kg	1.142	0.32	mg/kg	0.000032 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		25	mg/kg	1.126	28.147	mg/kg	0.00281 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	78	mg/kg		78	mg/kg	0.0078 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.56	mg/kg	1.353	0.758	mg/kg	0.0000758 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		19	mg/kg	2.637	50.097	mg/kg	0.00501 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		51	mg/kg	2.469	125.934	mg/kg	0.0126 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		13	mg/kg	1.462	19	mg/kg	0.0019 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		13	mg/kg	1.923	25	mg/kg	0.0025 %		
37		pH			PH		11.6	pH		11.6	pH	11.6 pH		
											Total:	0.0459 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: TP2 2 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP2 2 m
Sample Depth:
2 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
13		fluoranthene		205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
14		pyrene		204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				2	mg/kg	1.197	2.394	mg/kg	0.000239 %		
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				15	mg/kg	1.32	19.805	mg/kg	0.00198 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				66	mg/kg	1.117	73.689	mg/kg	0.00737 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.7	mg/kg	1.142	0.8	mg/kg	0.00008 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	19	mg/kg		19	mg/kg	0.0019 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.2	mg/kg	1.353	0.271	mg/kg	0.0000271 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				33	mg/kg	2.637	87.011	mg/kg	0.0087 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
		034-002-00-8											
34		zinc { zinc sulphate }				39	mg/kg	2.469	96.303	mg/kg	0.00963 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				16	mg/kg	1.462	23.385	mg/kg	0.00234 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				16	mg/kg	1.923	30.77	mg/kg	0.00308 %		
		024-001-00-0	215-607-8	1333-82-0									
										Total:	0.0389 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: TP3 1 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP3 1 m
Sample Depth:
1 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
8		acenaphthylene		205-917-1	208-96-8		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
9		acenaphthene		201-469-6	83-32-9		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
10		fluorene		201-695-5	86-73-7		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
11		phenanthrene		201-581-5	85-01-8		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
12		anthracene		204-371-1	120-12-7		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
13		fluoranthene		205-912-4	206-44-0		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
14		pyrene		204-927-3	129-00-0		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				17	mg/kg	1.32	22.446	mg/kg	0.00224 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				70	mg/kg	1.117	78.155	mg/kg	0.00782 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.34	mg/kg	1.142	0.388	mg/kg	0.0000388 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				25	mg/kg	1.126	28.147	mg/kg	0.00281 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	87	mg/kg		87	mg/kg	0.0087 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.63	mg/kg	1.353	0.853	mg/kg	0.0000853 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				19	mg/kg	2.637	50.097	mg/kg	0.00501 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
		034-002-00-8											
34		zinc { zinc sulphate }				42	mg/kg	2.469	103.71	mg/kg	0.0104 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				14	mg/kg	1.462	20.462	mg/kg	0.00205 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				14	mg/kg	1.923	26.924	mg/kg	0.00269 %		
		024-001-00-0	215-607-8	1333-82-0									
										Total:	0.0442 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: TP3 2.5 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP3 2.5 m
Sample Depth:
2.5 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
13		fluoranthene		205-912-4	206-44-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
14		pyrene		204-927-3	129-00-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				15	mg/kg	1.32	19.805	mg/kg	0.00198 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				68	mg/kg	1.117	75.922	mg/kg	0.00759 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.56	mg/kg	1.142	0.64	mg/kg	0.000064 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				28	mg/kg	1.126	31.525	mg/kg	0.00315 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	39	mg/kg		39	mg/kg	0.0039 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.23	mg/kg	1.353	0.311	mg/kg	0.0000311 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				20	mg/kg	2.637	52.734	mg/kg	0.00527 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
		034-002-00-8											
34		zinc { zinc sulphate }				54	mg/kg	2.469	133.342	mg/kg	0.0133 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				14	mg/kg	1.462	20.462	mg/kg	0.00205 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				14	mg/kg	1.923	26.924	mg/kg	0.00269 %		
		024-001-00-0	215-607-8	1333-82-0									
37		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
										Total:	0.0425 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: TP4 0.5 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP4 0.5 m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.5 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	●	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
4	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
8	●	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
9	●	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
10	●	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
11	●	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
12	●	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13	●	fluoranthene		205-912-4	206-44-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
14	●	pyrene		204-927-3	129-00-0		0.18	mg/kg		0.18	mg/kg	0.000018 %		
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				3	mg/kg	1.197	3.591	mg/kg	0.000359 %		
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				22	mg/kg	1.32	29.047	mg/kg	0.0029 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				330	mg/kg	1.117	368.447	mg/kg	0.0368 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.36	mg/kg	1.142	0.411	mg/kg	0.0000411 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				31	mg/kg	1.126	34.903	mg/kg	0.00349 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	500	mg/kg		500	mg/kg	0.05 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.84	mg/kg	1.353	1.137	mg/kg	0.000114 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				20	mg/kg	2.637	52.734	mg/kg	0.00527 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
		034-002-00-8											
34		zinc { zinc sulphate }				160	mg/kg	2.469	395.087	mg/kg	0.0395 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				18	mg/kg	1.462	26.308	mg/kg	0.00263 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				18	mg/kg	1.923	34.616	mg/kg	0.00346 %		
		024-001-00-0	215-607-8	1333-82-0									
										Total:	0.146 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: TP4 2 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP4 2 m
Sample Depth:
2 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		71	mg/kg		71	mg/kg	0.0071 %		
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
8		acenaphthylene		205-917-1	208-96-8		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
9		acenaphthene		201-469-6	83-32-9		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
10		fluorene		201-695-5	86-73-7		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
11		phenanthrene		201-581-5	85-01-8		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
12		anthracene		204-371-1	120-12-7		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
13		fluoranthene		205-912-4	206-44-0		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
14		pyrene		204-927-3	129-00-0		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				20	mg/kg	1.32	26.407	mg/kg	0.00264 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				33	mg/kg	1.117	36.845	mg/kg	0.00368 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.33	mg/kg	1.142	0.377	mg/kg	0.0000377 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				11	mg/kg	1.126	12.385	mg/kg	0.00124 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16	mg/kg		16	mg/kg	0.0016 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.12	mg/kg	1.353	0.162	mg/kg	0.0000162 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				15	mg/kg	2.637	39.55	mg/kg	0.00396 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
		034-002-00-8											
34		zinc { zinc sulphate }				22	mg/kg	2.469	54.325	mg/kg	0.00543 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				9.7	mg/kg	1.462	14.177	mg/kg	0.00142 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				9.7	mg/kg	1.923	18.654	mg/kg	0.00187 %		
		024-001-00-0	215-607-8	1333-82-0									
37		pH				8.7	pH		8.7	pH	8.7 pH		
				PH									
										Total:	0.0304 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this Hazardous property to non hazardous because As the sample is a solid waste (soil and stones) it is not considered to be hazardous in terms of the flammable hazardous property HP 3(i) as this hazard property relates to liquid substances only

Classification of sample: TP5 0.5 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP5 0.5 m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.5 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
13		fluoranthene		205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
14		pyrene		204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
20		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		5.8	mg/kg	1.197	6.943	mg/kg	0.000694 %		
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		28	mg/kg	1.32	36.969	mg/kg	0.0037 %		
26		barium { barium oxide }		215-127-9	1304-28-5		120	mg/kg	1.117	133.981	mg/kg	0.0134 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		0.41	mg/kg	1.142	0.468	mg/kg	0.0000468 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		65	mg/kg	1.126	73.183	mg/kg	0.00732 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	270	mg/kg		270	mg/kg	0.027 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.6	mg/kg	1.353	2.166	mg/kg	0.000217 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.2	mg/kg	1.5	3.3	mg/kg	0.00033 %		
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		26	mg/kg	2.637	68.554	mg/kg	0.00686 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		150	mg/kg	2.469	370.394	mg/kg	0.037 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		19	mg/kg	1.462	27.77	mg/kg	0.00278 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		19	mg/kg	1.923	36.539	mg/kg	0.00365 %		
											Total:	0.104 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: TP6 1 m

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
TP6 1 m
Sample Depth:
1 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1A; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

lead compounds with the exception of those specified elsewhere in this Annex (worst case): (Note 1 conc.: 0.26%)

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Risk phrases hit:

R50/53 "Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment"

Because of determinand:

lead compounds with the exception of those specified elsewhere in this Annex (worst case): (Note 1 conc.: 0.26%)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		TPH (C6 to C40) petroleum group		TPH		73	mg/kg		73	mg/kg	0.0073 %		
2		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
3		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
4		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
5		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
7		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
8		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
9		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
10		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
11		phenanthrene				0.49	mg/kg		0.49	mg/kg	0.000049 %		
			201-581-5	85-01-8									
12		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
13		fluoranthene				1.6	mg/kg		1.6	mg/kg	0.00016 %		
			205-912-4	206-44-0									
14		pyrene				1.6	mg/kg		1.6	mg/kg	0.00016 %		
			204-927-3	129-00-0									
15		benzo[a]anthracene				0.85	mg/kg		0.85	mg/kg	0.000085 %		
		601-033-00-9	200-280-6	56-55-3									
16		chrysene				1.2	mg/kg		1.2	mg/kg	0.00012 %		
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				1.2	mg/kg		1.2	mg/kg	0.00012 %		
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				0.86	mg/kg		0.86	mg/kg	0.000086 %		
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				0.81	mg/kg		0.81	mg/kg	0.000081 %		
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				1.1	mg/kg		1.1	mg/kg	0.00011 %		
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				0.72	mg/kg		0.72	mg/kg	0.000072 %		
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				370	mg/kg	1.197	442.928	mg/kg	0.0443 %		
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				26	mg/kg	1.32	34.328	mg/kg	0.00343 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				320	mg/kg	1.117	357.282	mg/kg	0.0357 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.48	mg/kg	1.142	0.548	mg/kg	0.0000548 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				47	mg/kg	1.126	52.917	mg/kg	0.00529 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	2600	mg/kg		2600	mg/kg	0.26 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.86	mg/kg	1.353	1.164	mg/kg	0.000116 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				25	mg/kg	2.637	65.917	mg/kg	0.00659 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
		034-002-00-8											
34		zinc { zinc sulphate }				320	mg/kg	2.469	790.175	mg/kg	0.079 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				19	mg/kg	1.462	27.77	mg/kg	0.00278 %		
			215-160-9	1308-38-9									

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				19 mg/kg	1.923	36.539 mg/kg	0.00365 %		
		024-001-00-0	215-607-8	1333-82-0							
37		pH				10.8 pH		10.8 pH	10.8 pH		
				PH							
								Total:	0.45 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this Hazardous property to non hazardous because As the sample is a solid waste (soil and stones) it is not considered to be hazardous in terms of the flammable hazardous property HP 3(i) as this hazard property relates to liquid substances only

Classification of sample: TP6 3 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP6 3 m
Sample Depth:
3 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
8		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
9		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
10		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
11		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
12		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13		fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
14		pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
20		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		10	mg/kg	1.197	11.971	mg/kg	0.0012 %		
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		23	mg/kg	1.32	30.367	mg/kg	0.00304 %		
26		barium { barium oxide }		215-127-9	1304-28-5		32	mg/kg	1.117	35.728	mg/kg	0.00357 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		0.35	mg/kg	1.142	0.4	mg/kg	0.00004 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		8.9	mg/kg	1.126	10.02	mg/kg	0.001 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	24	mg/kg		24	mg/kg	0.0024 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.13	mg/kg	1.353	0.176	mg/kg	0.0000176 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		13	mg/kg	2.637	34.277	mg/kg	0.00343 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		21	mg/kg	2.469	51.855	mg/kg	0.00519 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		8.4	mg/kg	1.462	12.277	mg/kg	0.00123 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		8.4	mg/kg	1.923	16.154	mg/kg	0.00162 %		
37		pH			PH		8.9	pH		8.9	pH	8.9 pH		
											Total:	0.0242 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS01 0.1-0.7 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS01 0.1-0.7 m
Sample Depth:
0.1-0.7 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		22	mg/kg		22	mg/kg	0.0022 %		
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
8		acenaphthylene		205-917-1	208-96-8		0.36	mg/kg		0.36	mg/kg	0.000036 %		
9		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
10		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
11		phenanthrene		201-581-5	85-01-8		0.54	mg/kg		0.54	mg/kg	0.000054 %		
12		anthracene		204-371-1	120-12-7		0.35	mg/kg		0.35	mg/kg	0.000035 %		
13		fluoranthene		205-912-4	206-44-0		5.5	mg/kg		5.5	mg/kg	0.00055 %		
14		pyrene		204-927-3	129-00-0		5.7	mg/kg		5.7	mg/kg	0.00057 %		
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		3.2	mg/kg		3.2	mg/kg	0.00032 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				3.2	mg/kg		3.2	mg/kg	0.00032 %		
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				3.9	mg/kg		3.9	mg/kg	0.00039 %		
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				2.6	mg/kg		2.6	mg/kg	0.00026 %		
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				0.6	mg/kg		0.6	mg/kg	0.00006 %		
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				2.7	mg/kg		2.7	mg/kg	0.00027 %		
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				3.5	mg/kg		3.5	mg/kg	0.00035 %		
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				1.9	mg/kg		1.9	mg/kg	0.00019 %		
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				5.6	mg/kg	1.197	6.704	mg/kg	0.00067 %		
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				23	mg/kg	1.32	30.367	mg/kg	0.00304 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				240	mg/kg	1.117	267.961	mg/kg	0.0268 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.37	mg/kg	1.142	0.423	mg/kg	0.0000423 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				48	mg/kg	1.126	54.043	mg/kg	0.0054 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	560	mg/kg		560	mg/kg	0.056 %		
		082-001-00-6											
30		mercury { mercury dichloride }				1.3	mg/kg	1.353	1.76	mg/kg	0.000176 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<**LOD**
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				19	mg/kg	2.637	50.097	mg/kg	0.00501 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<**LOD**
		034-002-00-8											
34		zinc { zinc sulphate }				110	mg/kg	2.469	271.623	mg/kg	0.0272 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				14	mg/kg	1.462	20.462	mg/kg	0.00205 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				14	mg/kg	1.923	26.924	mg/kg	0.00269 %		
		024-001-00-0	215-607-8	1333-82-0									
										Total:	0.135 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this Hazardous property to non hazardous because As the sample is a solid waste (soil and stones) it is not considered to be hazardous in terms of the flammable hazardous property HP 3(i) as this hazard property relates to liquid substances only

Classification of sample: WS01 1.45 - 2.60 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS01 1.45 - 2.60 m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
1.45 - 2.60 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
13		fluoranthene		205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
14		pyrene		204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
20		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19	mg/kg	1.32	25.086	mg/kg	0.00251 %		
26		barium { barium oxide }		215-127-9	1304-28-5		31	mg/kg	1.117	34.612	mg/kg	0.00346 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		0.4	mg/kg	1.142	0.457	mg/kg	0.0000457 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		8.9	mg/kg	1.126	10.02	mg/kg	0.001 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	12	mg/kg		12	mg/kg	0.0012 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.13	mg/kg	1.353	0.176	mg/kg	0.0000176 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		16	mg/kg	2.637	42.187	mg/kg	0.00422 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		20	mg/kg	2.469	49.386	mg/kg	0.00494 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		9.7	mg/kg	1.462	14.177	mg/kg	0.00142 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		9.7	mg/kg	1.923	18.654	mg/kg	0.00187 %		
37		pH			PH		8.7	pH		8.7	pH	8.7 pH		
											Total:	0.0224 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS02 0.1 - 0.55 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS02 0.1 - 0.55 m
Sample Depth:
0.1 - 0.55 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
13		fluoranthene		205-912-4	206-44-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
14		pyrene		204-927-3	129-00-0		0.15	mg/kg		0.15	mg/kg	0.000015 %		
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				2.2	mg/kg	1.197	2.634	mg/kg	0.000263 %		
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				20	mg/kg	1.32	26.407	mg/kg	0.00264 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				190	mg/kg	1.117	212.136	mg/kg	0.0212 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.29	mg/kg	1.142	0.331	mg/kg	0.0000331 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				31	mg/kg	1.126	34.903	mg/kg	0.00349 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	330	mg/kg		330	mg/kg	0.033 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.28	mg/kg	1.353	0.379	mg/kg	0.0000379 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				25	mg/kg	2.637	65.917	mg/kg	0.00659 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
		034-002-00-8											
34		zinc { zinc sulphate }				75	mg/kg	2.469	185.197	mg/kg	0.0185 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				19	mg/kg	1.462	27.77	mg/kg	0.00278 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				19	mg/kg	1.923	36.539	mg/kg	0.00365 %		
		024-001-00-0	215-607-8	1333-82-0									
										Total:	0.0937 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS02 1.05 - 2.9 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS02 1.05 - 2.9 m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
1.05 - 2.9 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	●	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
4	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
8	●	acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
9	●	acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
10	●	fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
11	●	phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
12	●	anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13	●	fluoranthene		205-912-4	206-44-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
14	●	pyrene		204-927-3	129-00-0		0.2	mg/kg		0.2	mg/kg	0.00002 %		
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
20		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		23	mg/kg	1.32	30.367	mg/kg	0.00304 %		
26		barium { barium oxide }		215-127-9	1304-28-5		35	mg/kg	1.117	39.078	mg/kg	0.00391 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		0.42	mg/kg	1.142	0.48	mg/kg	0.000048 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		8.5	mg/kg	1.126	9.57	mg/kg	0.000957 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	18	mg/kg		18	mg/kg	0.0018 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.1	mg/kg	1.353	0.135	mg/kg	0.0000135 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		18	mg/kg	2.637	47.46	mg/kg	0.00475 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		25	mg/kg	2.469	61.732	mg/kg	0.00617 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		9.8	mg/kg	1.462	14.323	mg/kg	0.00143 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		9.8	mg/kg	1.923	18.846	mg/kg	0.00188 %		
37		pH			PH		8.7	pH		8.7	pH	8.7 pH		
											Total:	0.0258 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS03 0.1 - 0.35 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS03 0.1 - 0.35 m
Sample Depth:
0.1 - 0.35 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
13		fluoranthene		205-912-4	206-44-0		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
14		pyrene		204-927-3	129-00-0		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		**<LOD**
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		**<LOD**
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		**<LOD**
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		**<LOD**
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		**<LOD**
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		**<LOD**
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		**<LOD**
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		**<LOD**
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				23	mg/kg	1.32	30.367	mg/kg	0.00304 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				180	mg/kg	1.117	200.971	mg/kg	0.0201 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.27	mg/kg	1.142	0.308	mg/kg	0.0000308 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				79	mg/kg	1.126	88.945	mg/kg	0.00889 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	140	mg/kg		140	mg/kg	0.014 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.38	mg/kg	1.353	0.514	mg/kg	0.0000514 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		**<LOD**
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				27	mg/kg	2.637	71.19	mg/kg	0.00712 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		**<LOD**
		034-002-00-8											
34		zinc { zinc sulphate }				110	mg/kg	2.469	271.623	mg/kg	0.0272 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				19	mg/kg	1.462	27.77	mg/kg	0.00278 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				19	mg/kg	1.923	36.539	mg/kg	0.00365 %		
		024-001-00-0	215-607-8	1333-82-0									
										Total:	0.0892 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS03 0.35 - 1.0 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS03 0.35 - 1.0 m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.35 - 1.0 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		54 mg/kg		54 mg/kg	0.0054 %		
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<**LOD**
8		acenaphthylene		205-917-1	208-96-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<**LOD**
9		acenaphthene		201-469-6	83-32-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<**LOD**
10		fluorene		201-695-5	86-73-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<**LOD**
11		phenanthrene		201-581-5	85-01-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<**LOD**
12		anthracene		204-371-1	120-12-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<**LOD**
13		fluoranthene		205-912-4	206-44-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<**LOD**
14		pyrene		204-927-3	129-00-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<**LOD**
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<**LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		chrysene	601-048-00-0	205-923-4	218-01-9		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
18		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
20		benzo[ghi]perylene		205-883-8	191-24-2		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	22.446	mg/kg	0.00224 %		
26		barium { barium oxide }		215-127-9	1304-28-5		210	mg/kg	1.117	234.466	mg/kg	0.0234 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		0.82	mg/kg	1.142	0.937	mg/kg	0.0000937 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		130	mg/kg	1.126	146.365	mg/kg	0.0146 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	89	mg/kg		89	mg/kg	0.0089 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.54	mg/kg	1.353	0.731	mg/kg	0.0000731 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		32	mg/kg	2.637	84.374	mg/kg	0.00844 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		150	mg/kg	2.469	370.394	mg/kg	0.037 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		24	mg/kg	1.462	35.077	mg/kg	0.00351 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		24	mg/kg	1.923	46.155	mg/kg	0.00462 %		
37		pH			PH		7.9	pH		7.9	pH	7.9 pH		
											Total:	0.11 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this Hazardous property to non hazardous because As the sample is a solid waste (soil and stones) it is not considered to be hazardous in terms of the flammable hazardous property HP 3(i) as this hazard property relates to liquid substances only

Classification of sample: WS04 0.05 - 2.1 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS04 0.05 - 2.1 m
Sample Depth:
0.05 - 2.1 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		67	mg/kg		67	mg/kg	0.0067 %		
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		0.12	mg/kg		0.12	mg/kg	0.000012 %		
8		acenaphthylene		205-917-1	208-96-8		0.17	mg/kg		0.17	mg/kg	0.000017 %		
9		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
10		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
11		phenanthrene		201-581-5	85-01-8		1.2	mg/kg		1.2	mg/kg	0.00012 %		
12		anthracene		204-371-1	120-12-7		0.17	mg/kg		0.17	mg/kg	0.000017 %		
13		fluoranthene		205-912-4	206-44-0		2.2	mg/kg		2.2	mg/kg	0.00022 %		
14		pyrene		204-927-3	129-00-0		2	mg/kg		2	mg/kg	0.0002 %		
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.81	mg/kg		0.81	mg/kg	0.000081 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				1.3	mg/kg		1.3	mg/kg	0.00013 %		
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				0.89	mg/kg		0.89	mg/kg	0.000089 %		
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				0.57	mg/kg		0.57	mg/kg	0.000057 %		
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				0.5	mg/kg		0.5	mg/kg	0.00005 %		
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				0.95	mg/kg		0.95	mg/kg	0.000095 %		
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				0.65	mg/kg		0.65	mg/kg	0.000065 %		
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		**<LOD**
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				23	mg/kg	1.32	30.367	mg/kg	0.00304 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				96	mg/kg	1.117	107.185	mg/kg	0.0107 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.28	mg/kg	1.142	0.32	mg/kg	0.000032 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				29	mg/kg	1.126	32.651	mg/kg	0.00327 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	79	mg/kg		79	mg/kg	0.0079 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.22	mg/kg	1.353	0.298	mg/kg	0.0000298 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		**<LOD**
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				25	mg/kg	2.637	65.917	mg/kg	0.00659 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		**<LOD**
		034-002-00-8											
34		zinc { zinc sulphate }				80	mg/kg	2.469	197.544	mg/kg	0.0198 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				17	mg/kg	1.923	32.693	mg/kg	0.00327 %		
		024-001-00-0	215-607-8	1333-82-0									
										Total:	0.0656 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this Hazardous property to non hazardous because As the sample is a solid waste (soil and stones) it is not considered to be hazardous in terms of the flammable hazardous property HP 3(i) as this hazard property relates to liquid substances only

Classification of sample: WS04 2.1 - 2.6 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS04 2.1 - 2.6 m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
2.1 - 2.6 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
13		fluoranthene		205-912-4	206-44-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
14		pyrene		204-927-3	129-00-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		chrysene	601-048-00-0	205-923-4	218-01-9		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
18		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
20		benzo[ghi]perylene		205-883-8	191-24-2		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		35	mg/kg	1.32	46.211	mg/kg	0.00462 %		
26		barium { barium oxide }		215-127-9	1304-28-5		170	mg/kg	1.117	189.806	mg/kg	0.019 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		0.87	mg/kg	1.142	0.994	mg/kg	0.0000994 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		48	mg/kg	1.126	54.043	mg/kg	0.0054 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	72	mg/kg		72	mg/kg	0.0072 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.31	mg/kg	1.353	0.42	mg/kg	0.000042 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.1	mg/kg	1.5	4.651	mg/kg	0.000465 %		
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		33	mg/kg	2.637	87.011	mg/kg	0.0087 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		110	mg/kg	2.469	271.623	mg/kg	0.0272 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		27	mg/kg	1.462	39.462	mg/kg	0.00395 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		27	mg/kg	1.923	51.924	mg/kg	0.00519 %		
37		pH			PH		8	pH		8	pH	8pH		
											Total:	0.0839 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS05 0.05 - 1.35 m

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
WS05 0.05 - 1.35 m
Sample Depth:
0.05 - 1.35 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Risk phrases hit:

R50/53 "Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment"

Because of determinand:

zinc sulphate: (compound conc.: 0.321%)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
1		TPH (C6 to C40) petroleum group TPH		16 mg/kg		16 mg/kg	0.0016 %		
2		benzene 601-020-00-8 / 200-753-7 / 71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
3		toluene 601-021-00-3 / 203-625-9 / 108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
4		ethylbenzene 601-023-00-4 / 202-849-4 / 100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
5		xylene 601-022-00-9 / 202-422-2 [1], 203-396-5 [2], 203-576-3 [3], 215-535-7 [4] / 95-47-6 [1], 106-42-3 [2], 108-38-3 [3], 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
7		naphthalene 601-052-00-2 / 202-049-5 / 91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
8		acenaphthylene 205-917-1 / 208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
9		acenaphthene 201-469-6 / 83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
10		fluorene 201-695-5 / 86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**
11		phenanthrene 201-581-5 / 85-01-8		0.35 mg/kg		0.35 mg/kg	0.000035 %		
12		anthracene 204-371-1 / 120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<**LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
13		fluoranthene		205-912-4	206-44-0		0.84	mg/kg		0.84	mg/kg	0.000084 %		
14		pyrene		204-927-3	129-00-0		0.72	mg/kg		0.72	mg/kg	0.000072 %		
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.41	mg/kg		0.41	mg/kg	0.000041 %		
16		chrysene	601-048-00-0	205-923-4	218-01-9		0.64	mg/kg		0.64	mg/kg	0.000064 %		
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.43	mg/kg		0.43	mg/kg	0.000043 %		
18		indeno[123-cd]pyrene		205-893-2	193-39-5		0.24	mg/kg		0.24	mg/kg	0.000024 %		
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
20		benzo[ghi]perylene		205-883-8	191-24-2		0.24	mg/kg		0.24	mg/kg	0.000024 %		
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.47	mg/kg		0.47	mg/kg	0.000047 %		
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.37	mg/kg		0.37	mg/kg	0.000037 %		
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<**LOD**
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<**LOD**
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19	mg/kg	1.32	25.086	mg/kg	0.00251 %		
26		barium { barium oxide }		215-127-9	1304-28-5		100	mg/kg	1.117	111.651	mg/kg	0.0112 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		0.53	mg/kg	1.142	0.605	mg/kg	0.0000605 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		22	mg/kg	1.126	24.77	mg/kg	0.00248 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	270	mg/kg		270	mg/kg	0.027 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.28	mg/kg	1.353	0.379	mg/kg	0.0000379 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<**LOD**
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		22	mg/kg	2.637	58.007	mg/kg	0.0058 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<**LOD**
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		1300	mg/kg	2.469	3210.085	mg/kg	0.321 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		15	mg/kg	1.923	28.847	mg/kg	0.00288 %		
											Total:	0.378 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: Force this Hazardous property to non hazardous because As the sample is a solid waste (soil and stones) it is not considered to be hazardous in terms of the flammable hazardous property HP 3(i) as this hazard property relates to liquid substances only

Classification of sample: WS05 2.0 - 2.6 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS05 2.0 - 2.6 m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
2.0 - 2.6 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
8		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
9		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
10		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
11		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
12		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
13		fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
14		pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
20		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19	mg/kg	1.32	25.086	mg/kg	0.00251 %		
26		barium { barium oxide }		215-127-9	1304-28-5		180	mg/kg	1.117	200.971	mg/kg	0.0201 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		1	mg/kg	1.142	1.142	mg/kg	0.000114 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		94	mg/kg	1.126	105.834	mg/kg	0.0106 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	82	mg/kg		82	mg/kg	0.0082 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.54	mg/kg	1.353	0.731	mg/kg	0.0000731 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.4	mg/kg	1.5	3.6	mg/kg	0.00036 %		
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		38	mg/kg	2.637	100.194	mg/kg	0.01 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		310	mg/kg	2.469	765.482	mg/kg	0.0765 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		27	mg/kg	1.462	39.462	mg/kg	0.00395 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		27	mg/kg	1.923	51.924	mg/kg	0.00519 %		
37		pH			PH		7.9	pH		7.9	pH	7.9 pH		
											Total:	0.139 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS07 0.2 - 2.4 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS07 0.2 - 2.4 m
Sample Depth:
0.2 - 2.4 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
11		phenanthrene		201-581-5	85-01-8		0.52	mg/kg		0.52	mg/kg	0.000052 %		
12		anthracene		204-371-1	120-12-7		0.11	mg/kg		0.11	mg/kg	0.000011 %		
13		fluoranthene		205-912-4	206-44-0		0.93	mg/kg		0.93	mg/kg	0.000093 %		
14		pyrene		204-927-3	129-00-0		0.87	mg/kg		0.87	mg/kg	0.000087 %		
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.42	mg/kg		0.42	mg/kg	0.000042 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				0.75	mg/kg		0.75	mg/kg	0.000075 %		
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				0.41	mg/kg		0.41	mg/kg	0.000041 %		
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				0.26	mg/kg		0.26	mg/kg	0.000026 %		
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				0.12	mg/kg		0.12	mg/kg	0.000012 %		
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				0.33	mg/kg		0.33	mg/kg	0.000033 %		
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				0.44	mg/kg		0.44	mg/kg	0.000044 %		
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				0.33	mg/kg		0.33	mg/kg	0.000033 %		
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				2.4	mg/kg	1.197	2.873	mg/kg	0.000287 %		
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				19	mg/kg	1.32	25.086	mg/kg	0.00251 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				120	mg/kg	1.117	133.981	mg/kg	0.0134 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.21	mg/kg	1.142	0.24	mg/kg	0.000024 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				21	mg/kg	1.126	23.644	mg/kg	0.00236 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	120	mg/kg		120	mg/kg	0.012 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.65	mg/kg	1.353	0.88	mg/kg	0.000088 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<**LOD**
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				23	mg/kg	2.637	60.644	mg/kg	0.00606 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<**LOD**
		034-002-00-8											
34		zinc { zinc sulphate }				83	mg/kg	2.469	204.952	mg/kg	0.0205 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				18	mg/kg	1.462	26.308	mg/kg	0.00263 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				18	mg/kg	1.923	34.616	mg/kg	0.00346 %		
		024-001-00-0	215-607-8	1333-82-0									
										Total:	0.0653 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS07 2.4 - 2.9 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS07 2.4 - 2.9 m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
2.4 - 2.9 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
13		fluoranthene		205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
14		pyrene		204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
17		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
18		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
20		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
24		antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
25		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20	mg/kg	1.32	26.407	mg/kg	0.00264 %		
26		barium { barium oxide }		215-127-9	1304-28-5		24	mg/kg	1.117	26.796	mg/kg	0.00268 %		
27		cadmium { cadmium oxide }	048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]		0.31	mg/kg	1.142	0.354	mg/kg	0.0000354 %		
28		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		6.9	mg/kg	1.126	7.769	mg/kg	0.000777 %		
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	7.7	mg/kg		7.7	mg/kg	0.00077 %		
30		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.13	mg/kg	1.353	0.176	mg/kg	0.0000176 %		
31		molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
32		nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		13	mg/kg	2.637	34.277	mg/kg	0.00343 %		
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
34		zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		20	mg/kg	2.469	49.386	mg/kg	0.00494 %		
35		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		8.3	mg/kg	1.462	12.131	mg/kg	0.00121 %		
36		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		8.3	mg/kg	1.923	15.962	mg/kg	0.0016 %		
37		pH			PH		9	pH		9	pH	9pH		
											Total:	0.0198 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS08 0.2 - 1.0 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
WS08 0.2 - 1.0 m
Sample Depth:
0.2 - 1.0 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
13		fluoranthene		205-912-4	206-44-0		0.19	mg/kg		0.19	mg/kg	0.000019 %		
14		pyrene		204-927-3	129-00-0		0.18	mg/kg		0.18	mg/kg	0.000018 %		
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				21	mg/kg	1.32	27.727	mg/kg	0.00277 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				170	mg/kg	1.117	189.806	mg/kg	0.019 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.27	mg/kg	1.142	0.308	mg/kg	0.0000308 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				35	mg/kg	1.126	39.406	mg/kg	0.00394 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	480	mg/kg		480	mg/kg	0.048 %		
		082-001-00-6											
30		mercury { mercury dichloride }				1.7	mg/kg	1.353	2.301	mg/kg	0.00023 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				26	mg/kg	2.637	68.554	mg/kg	0.00686 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
		034-002-00-8											
34		zinc { zinc sulphate }				120	mg/kg	2.469	296.316	mg/kg	0.0296 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				23	mg/kg	1.462	33.616	mg/kg	0.00336 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				23	mg/kg	1.923	44.232	mg/kg	0.00442 %		
		024-001-00-0	215-607-8	1333-82-0									
37		pH				8.8	pH		8.8	pH	8.8 pH		
				PH									
										Total:	0.12 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Classification of sample: WS08 2.0 - 2.4 m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
WS08 2.0 - 2.4 m	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
2.0 - 2.4 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2		benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
3		toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
4		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
5		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
6		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
7		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
8		acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
9		acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
10		fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
11		phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
12		anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
13		fluoranthene		205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
14		pyrene		204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
16		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
17		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
18		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
19		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
20		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
21		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
22		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		polychlorobiphenyls; PCB				<0.0001	mg/kg		<0.0001	mg/kg	<0.00000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
24		antimony { antimony trioxide }				<2	mg/kg	1.197	<2.394	mg/kg	<0.000239 %		<LOD
		051-005-00-X	215-175-0	1309-64-4									
25		arsenic { arsenic trioxide }				22	mg/kg	1.32	29.047	mg/kg	0.0029 %		
		033-003-00-0	215-481-4	1327-53-3									
26		barium { barium oxide }				180	mg/kg	1.117	200.971	mg/kg	0.0201 %		
			215-127-9	1304-28-5									
27		cadmium { cadmium oxide }				0.53	mg/kg	1.142	0.605	mg/kg	0.0000605 %		
		048-002-00-0	231-152-8 [1] 215-146-2 [2]	7440-43-9 [1] 1306-19-0 [2]									
28		copper { dicopper oxide; copper (I) oxide }				54	mg/kg	1.126	60.798	mg/kg	0.00608 %		
		029-002-00-X	215-270-7	1317-39-1									
29		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	120	mg/kg		120	mg/kg	0.012 %		
		082-001-00-6											
30		mercury { mercury dichloride }				0.57	mg/kg	1.353	0.771	mg/kg	0.0000771 %		
		080-010-00-X	231-299-8	7487-94-7									
31		molybdenum { molybdenum(VI) oxide }				<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
		042-001-00-9	215-204-7	1313-27-5									
32		nickel { nickel sulfate }				24	mg/kg	2.637	63.28	mg/kg	0.00633 %		
		028-009-00-5	232-104-9	7786-81-4									
33		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
		034-002-00-8											
34		zinc { zinc sulphate }				110	mg/kg	2.469	271.623	mg/kg	0.0272 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
35		chromium in chromium(III) compounds { chromium(III) oxide }				23	mg/kg	1.462	33.616	mg/kg	0.00336 %		
			215-160-9	1308-38-9									
36		chromium in chromium(VI) compounds { chromium(VI) oxide }				23	mg/kg	1.923	44.232	mg/kg	0.00442 %		
		024-001-00-0	215-607-8	1333-82-0									
										Total:	0.0842 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2 on Ox. Gas 1; H270, Ox. Liq. 1; H271, Ox. Sol. 1; H271, Ox. Liq. 2; H272, Ox. Sol. 2; H272, Ox. Liq. 3; H272, Ox. Sol. 3; H272: Force this Hazardous property to non hazardous because Reported chromium concentrations are within the EPA national background levels (median Cr concentration in Irish soils = 42.6 mg/kg, 98th percentile = 99.6 mg/kg; Environmental Protection Agency, Towards a National Soil Database, 2001-CD/S2-M2, 2007), and are therefore not considered to be hazardous in terms of the oxidising hazardous property (HP2). The reported chromium concentrations are not considered to be a risk for combustion.

Appendix A: Classifier defined and non CLP determinands

- **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25/05/2015
Risk Phrases: R10 , R45 , R46 , R51/53 , R63 , R65
Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

- **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03/06/2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17/07/2015
Risk Phrases: R22 , R26 , R27 , R36 , R37 , R38
Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17/07/2015
Risk Phrases: R36 , R37 , R38 , N R50/53 , N R51/53
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06/08/2015
Risk Phrases: N R50/53
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06/08/2015
Risk Phrases: R22 , R36 , R37 , R38 , R40 , R43 , N R50/53
Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17/07/2015
Risk Phrases: R36 , R37 , R38 , R43 , N R50/53
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21/08/2015
Risk Phrases: Xn R22 , N R50/53
Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21/08/2015
Risk Phrases: Xi R36/37/38 , N R50/53
Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06/08/2015
Risk Phrases: R40
Hazard Statements: Carc. 2 H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23/07/2015
Risk Phrases: N R50/53
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
29/09/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

barium oxide (EC Number: 215-127-9, CAS Number: 1304-28-5)

Conversion factor: 1.117
Description/Comments: Data from C&L Inventory Database; No entries in Registered Substances Database, IARC or Pesticide Properties Database
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=88825&HarmOnly=no?fc=true&lang=en
Data source date: 02/06/2014
Risk Phrases: R20 , R22 , R25 , R35 , R36/37/38
Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Acute Tox. 3 H301 , Skin Corr. 1A H314 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

dicopper oxide; copper (I) oxide (EC Number: 215-270-7, CAS Number: 1317-39-1)

CLP index number: 029-002-00-X
Data source: Regulation (EU) 2016/1179 of 19 July 2016 (ATP9)
Additional Risk Phrases: N R50/53 , N R50/53 >= 0.25 %
Additional Hazard Statement(s): None.
Reason for additional Hazards Statement(s)/Risk Phrase(s):
10/10/2016 - N R50/53 risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases
10/10/2016 - N R50/53 >= 0.25 % risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

CLP index number: 082-001-00-6
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03/06/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17/07/2015
Risk Phrases: R20 , R22 , R36 , R37 , R38 , R42 , R43 , R50/53 , R60 , R61
Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25/05/2015
Risk Phrases: None.
Hazard Statements: None.

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

barium {barium oxide}

Reported chromium VI concentrations are insufficient for chromate species to be present at concentrations exceeding the hazardous threshold; next most conservative species selected

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Reported chromium VI concentrations are insufficient for chromate species to be present at concentrations exceeding the hazardous threshold; next most conservative species selected

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel sulfate}

Reported chromium VI concentrations are insufficient for chromate species to be present at concentrations exceeding the hazardous threshold; next most conservative species selected

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc sulphate}

Reported chromium VI concentrations are insufficient for chromate species to be present at concentrations exceeding the hazardous threshold; next most conservative species selected

chromium in chromium(III) compounds {chromium(III) oxide}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition, May 2015
HazWasteOnline Classification Engine Version: 2017.153.3329.6717 (02 Jun 2017)
HazWasteOnline Database: 2017.153.3329.6717 (03 Jun 2017)

This classification utilises the following guidance and legislation:
WM3 - Waste Classification - May 2015
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

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Appendix 7.B

DRAFT

Project Opera

Well Survey and Groundwater Level Monitoring

Limerick City & County Council / Limerick 2030

Project reference: PR-289270

PR-289270-ACM-RP-EN-001

30 May 2018

Quality Information

Prepared by	Verified by	Approved by
Edel O'Hannelly Principal Hydrogeologist	Kevin Forde Associate Director	David Mullan Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	30 May 2018	Original for review	Yes	David Mullan	Associate Director

Distribution List

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0	1	AECOM

Prepared for:

Limerick City & County Council / Limerick 2030

Prepared by:

Edel O'Hannelly
Principal Hydrogeologist
M: 087 2887392
E: edel.ohannelly@aecom.com

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The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this Report. The work described in this Report was undertaken between 04 May 2018 and 18 May 2018 and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances. AECOM disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to AECOM's attention after the date of the Report.

The monitoring wells accessed during the fieldwork, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The comments made and recommendations given in this Report are based on the ground conditions apparent at the site of the monitoring wells. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this Report.

The comments made on groundwater conditions are based on observations made during site work and the limited monitoring programme. It should be noted that groundwater levels might vary owing to seasonal or other effects.

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Table of Contents

1. Introduction

AECOM Ireland Limited (AECOM) is pleased to present this report on groundwater elevation gauging and monitoring well survey for the Project Opera site, to Limerick City & County Council / Limerick 2030 (the Client). The work detailed in this report was completed in accordance with AECOM proposal reference: 60557460, dated 19 February 2018.

The Project Opera development site (the site) is located in Limerick city centre. It is bounded to the north by Bank Place, to the east by Patrick Street and Rutland Street, to the west by Michael Street and to the south by Ellen Street. The site location is presented in Appendix A Figure 1 and the site layout is presented in Appendix A Figure 2.

2. Project Background

The site covers an area of approximately 1.62 hectares and is located within a predominantly commercial area of Limerick City Centre on the eastern bank of the River Shannon. The site consists of a number of residential, commercial and industrial buildings, some of which are currently occupied and some of which are derelict.

It is the understanding of AECOM that the Client is proposing to develop and regenerate the site for mixed use development comprising office, retail, culture, and licensed premises uses. As part of the proposed development some of the existing buildings will be demolished, while some will be retained. In addition, a number of new multi-story commercial and residential buildings are proposed for the site.

The development works will comprise:

- The demolition of No's. 6 and 7 Rutland Street; No's 6 and 7/8 Patrick Street; No. 3 Ellen Street, the former Cahill May Roberts building; and warehouse/workspace buildings;
- Refurbishment and modifications of: No's. 4 and 5 Rutland Street, No's 1-5 Patrick Street and No's 4 – 6 Ellen Street, Town Hall (Protected Structure), No's 8-9 Rutland Street, No's 7-9 Ellen Street and modification of the cut stone warehouse Granary (Protected Structure) facing Bank's Place and Michael Street;
- Construction of a commercial building, comprising 11-14-storeys over one basement level, fronting Bank Place; a 5-7 storey building over one basement level fronting Rutland Street and a proposed public plaza; and a 4-8 storey building fronting Michael Street; and
- Development of a public plaza; pedestrian linkages; communal and private open space areas; bicycle parking; vehicular access and 150 car parking spaces at basement level; surface water attenuation tanks, general plant; storage areas and refuse management; signage; diversion of underground services; set-down areas; and all related site development and excavation works above and below ground.

3. Project Objectives

Due to the location of the site within 200 m of the tidal Shannon Estuary and Abbey River, it was considered possible that groundwater beneath the site could be tidally influenced, which may have implications for construction works on site, in particular for basements, and also with regard to flood management. A programme of groundwater level monitoring was proposed to assess tidal fluctuations of groundwater beneath the site.

4. Scope of Works

Site investigation works undertaken on the site in May 2017 included the installation of shallow groundwater monitoring wells. The following tasks were proposed to establish depth to groundwater, groundwater flow direction and assess whether groundwater is tidally influenced beneath the site.

- Task 1 – Fieldwork, Surveying, Groundwater Elevation Gauging
- Task 2 – Data Assessment

4.1 Task 1 – Fieldwork, Surveying, Groundwater Elevation Gauging

4.1.1 Surveying

As part of a geotechnical site investigation undertaken by Irish Geotechnical Site Investigations Limited (IGSL) in May 2017, monitoring wells were installed in six boreholes (BH1 to BH5 and BH8) and in one window sampling bore (WS3). The monitoring wells were installed to a maximum depth of 4 metres below ground level (m bgl). Monitoring well locations are illustrated in Appendix A Figure 2.

On 18 May 2018, the location (grid co-ordinates to both ITN and ING) and elevation (to Ordnance Datum, OD) of all accessible monitoring wells was surveyed by an experienced surveyor (Murphy Surveys Limited). These elevations allow depth to groundwater measurements to be converted to groundwater elevations relative to OD and, together with the grid co-ordinates, these allow the hydraulic gradient across the site to be calculated.

Of the seven wells installed, six were accessible during the survey. Well BH5, located in the car park in the east of the site, appears to have been covered over by new tarmacadam surfacing since installation, see Photographs 5 and 6 in Appendix B.

Well location co-ordinates and depth to groundwater measurements are presented in Appendix C Table 1.

4.1.2 Groundwater Elevation Gauging

As it was considered possible that groundwater beneath the site could be tidally influenced data loggers were installed to monitor changes in pressure (i.e. pressure due to the height of water above the logger) in selected wells. The loggers were installed near the base of three of the seven wells on site (BH2, BH3 and BH8). A fourth pressure logger (a barologger – measuring atmospheric pressure variation) was positioned close to the well locations to record ambient air pressure.

The loggers were set to record water level at five minute intervals over a two week period from 04 May 2018 to 18 May 2018, to assess changes in groundwater elevation in response to the tidal cycle.

In addition, manual depth to groundwater measurements were recorded using an interface probe from all accessible wells following installation of the loggers and prior to their removal.

4.2 Task 2 – Data Assessment and Reporting

4.2.1 Groundwater Flow Direction

Based on the survey results and depth to groundwater measurements recorded on 04 and 18 May 2018, the direction of groundwater flow across the site is to the north-west, toward the River Shannon, see Appendix A Figures 3 and 4.

The highest groundwater elevation is in monitoring well BH4, located in the car park in the south-eastern corner of the site. The lowest groundwater elevation is in monitoring well BH8, which is located in the north-eastern quadrant of the site and is the closest monitoring well to the Abbey River.

Based on groundwater elevations the hydraulic gradient across the site on 04 May 2018 was 0.018 while on 18 May 2018 it was 0.011.

4.2.2 Groundwater Fluctuations

Changes in groundwater level were recorded by the dataloggers in wells BH2, BH3 and BH8 between 04 May and 18 May 2018. In Appendix A Figure 5, changes in groundwater elevation for all three monitoring wells are graphed together. Rainfall events and the tidal cycle for the River Shannon at Limerick Docks are also plotted in Appendix A Figure 5. Changes in groundwater elevation over the monitoring period for individual wells are graphed in Appendix A Figures 6 to 8.

As indicated by the dip measurements, there was little change in groundwater elevation between 04 and 18 May. The highest groundwater elevation was always in monitoring well BH3 with the lowest generally in well BH8. Some minor changes in elevation were apparent in response to the tidal cycle and rainfall events.

Tidal range in the River Shannon varied between 6.1 m and 3.0 m during the monitoring period. The greatest difference between high and low tides occurred during the spring tides on 16 May 2018, with the lowest during neap tides on 08 May 2018. High tide elevations ranged between 4.4 m OD and 6.3 m OD, with low tides between 1.4 m OD and 0.2 m OD.

Despite the proximity of the River Shannon and its large tidal range, the corresponding groundwater tidal fluctuations were low. Hardly any fluctuation due to tides could be seen in well BH3. In monitoring wells BH2 and BH8, groundwater level fluctuations of the order of mm to cm can be seen in response to tides.

Rainfall amounts during the monitoring period were generally less than 0.5 mm per hour. Two periods of more substantial rainfall occurred on 09 and 11 May 2018. On 09 May, a total of 3.9 mm fell over the course of the day with 3.5 mm of that falling between the hours of 11:00 and 13:00. On 11 May, 7.7 mm of rain fell, with 6.0 mm of that falling between the hours of 08:00 and 10:00.

Prior to rainfall on 09 May, groundwater elevations were declining in all three monitoring wells, following that rainfall event groundwater elevations ceased to decline.

However, following the larger rainfall event on 11 May, the groundwater elevation in all three monitoring wells increased. The highest groundwater elevation recorded occurred in each of the three monitoring wells following the 11 May rainfall event.

The particularly marked increases in groundwater elevation seen at monitoring well BH8 following each rainfall event are not considered to represent actual groundwater response. It appears that during periods of rainfall surface water runoff is getting directly into this well resulting in short-term erroneously high elevations being recorded.

5. Conclusions

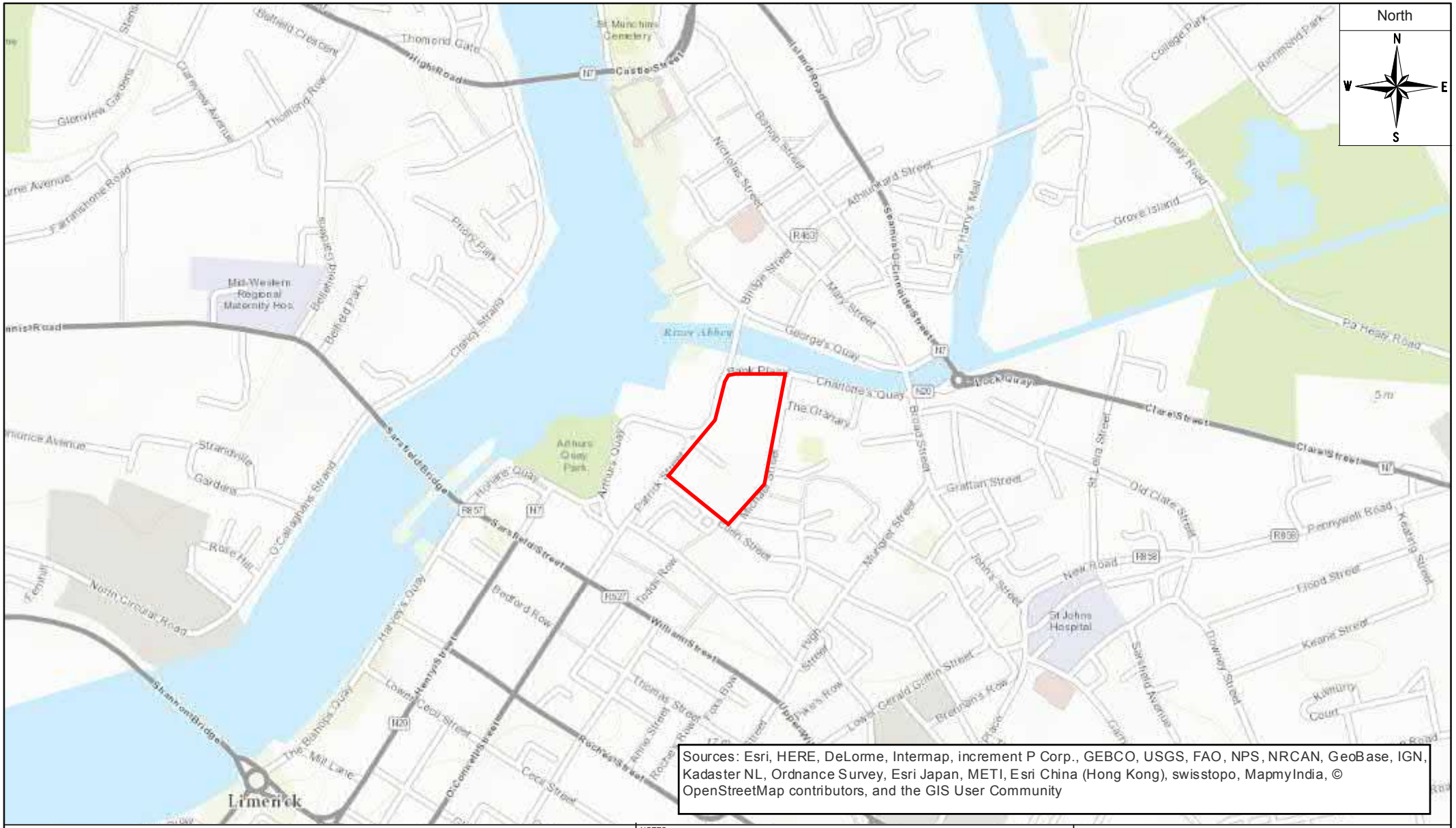
In light of planned redevelopment at the Project Opera site in Limerick city centre, and the potential for groundwater to be tidally influenced, which may have implications for construction work, groundwater monitoring wells were surveyed and levels monitored for an extended period in May 2018.

Survey and depth to groundwater measurements indicate that the direction of groundwater flow across the site is to the north-west. Depth to groundwater during the monitoring period was between 1.0 m and 1.9 m below ground level, with corresponding elevations between 1.8 m and 2.5 m OD.

Continuous monitoring data between 04 and 18 May indicate that groundwater in the north and west of the site responds only slightly to tidal fluctuations, in the region of mm to cm responses.

Groundwater responds quickly to rainfall, though at least one monitoring well appears to have been poorly completed, leading to direct surface water runoff into the well.

Appendix A Figures



CLIENT
LIMERICK CITY & COUNTY COUNCIL
LIMERICK 2030

DRAWING TITLE
FIGURE 1 - SITE LOCATION

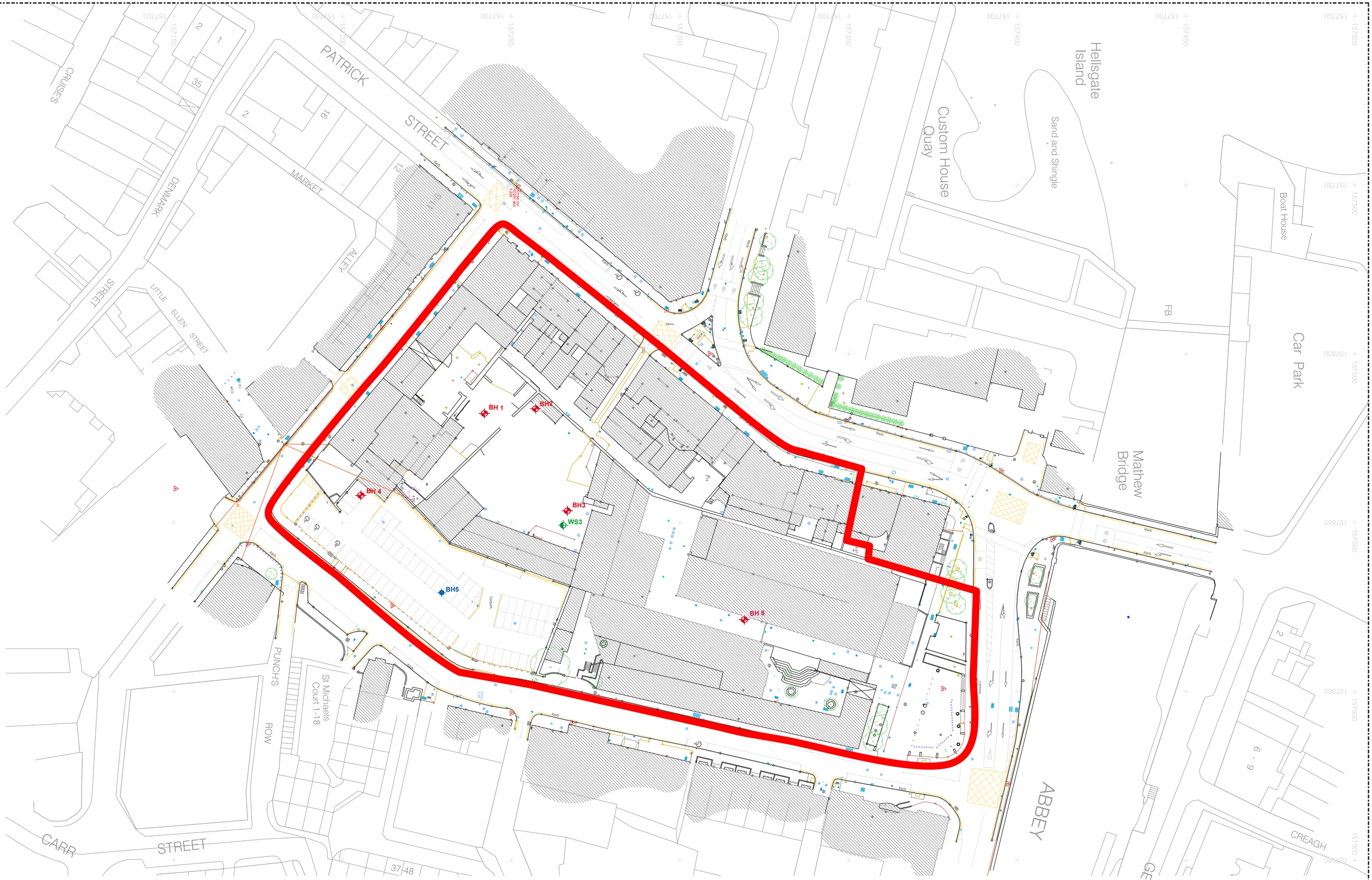
PROJECT LOCATION
PROJECT OPERA

DRAWN	CHECKED	APPROVED	DATE
CC	EOH	EOH	MAY2018
SCALE N.T.S	Job No. **PR-289270**		REV. A

NOTES

SITE BOUNDARY

AECOM
4TH FLOOR, ADELPHI PLAZA, ADELPHI CENTRE,
GEORGE'S STREET UPPER, DUN LAOGHAIRE,
DUBLIN
TEL +353 21 436 5006 www.aecom.com



Title
Figure 2_Site Layout with Well Locations
Project Location
Project Opera
Client
Limerick City and Co Council, Limerick 2030

LEGEND

- Accessible boreholes
- Inaccessiblle borehole
- Window Sampling Well
- Site Bounday

Drawn	Checked	Approved	Date
CC	EOH	EOH	MAY 2018
SCALE N.T.S	JOB NO. PR-289270		REV A

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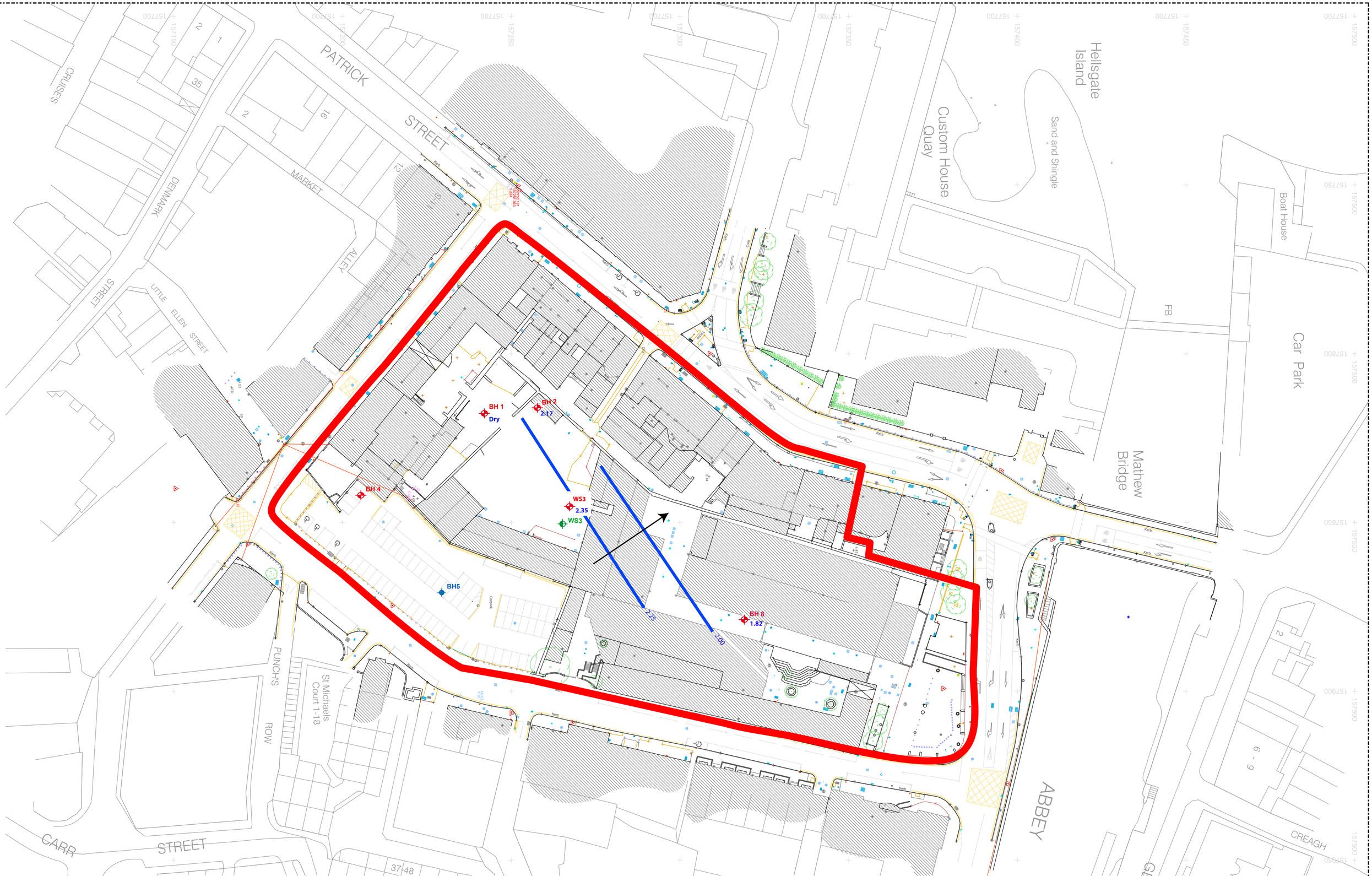
T +353-1-238-3100
aecom.com



Title
Figure 3_Ground Water Contour Map (04.05.2018)
Project Location
Project Opera
Client
Limerick City and Co Council, Limerick 2030

LEGEND

- Accessible boreholes
- Inaccessiblle borehole
- Ground water Countour
- Window Sampling Well
- Site Boundary
- Direction of Groundwater Flow

Drawn	Checked	Approved	Date
CC	EOH	EOH	MAY 2018
SCALE N.T.S	JOB NO. PR-289270		REV A

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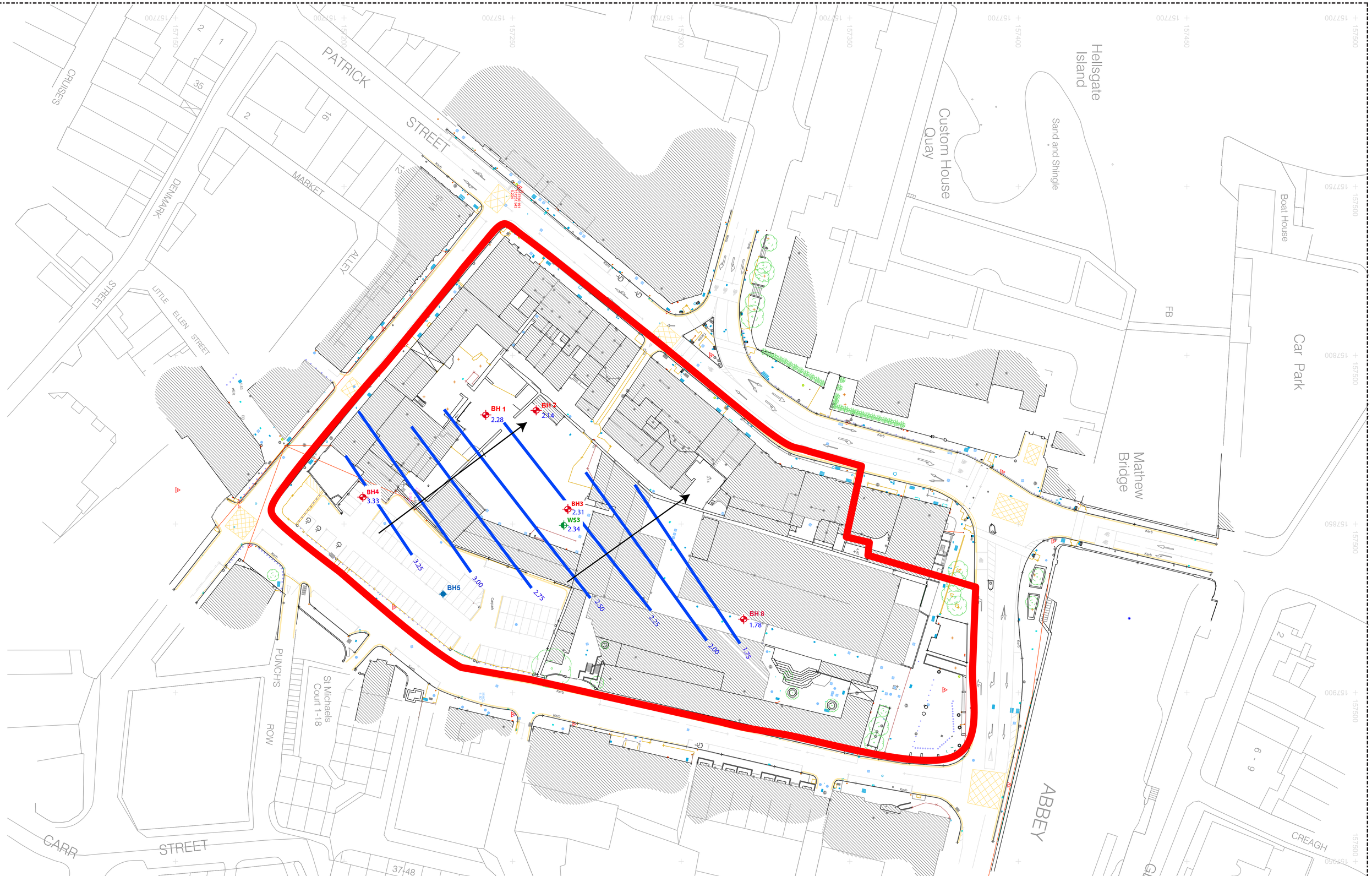

Title
Figure 4_Ground Water Contour Map (18.05.2018)
Project Location
Project Opera
Client
Limerick City and Co Council, Limerick 2030

LEGEND

- Accessible boreholes
- Inaccessiblle borehole
- Groundwater Contour
- Window Sampling Well
- Site Boundary
- Direction of Groundwater Flow

Drawn	Checked	Approved	Date
CC	EOH	EOH	MAY 2018
SCALE N.T.S	JOB NO. PR-289270		REV A

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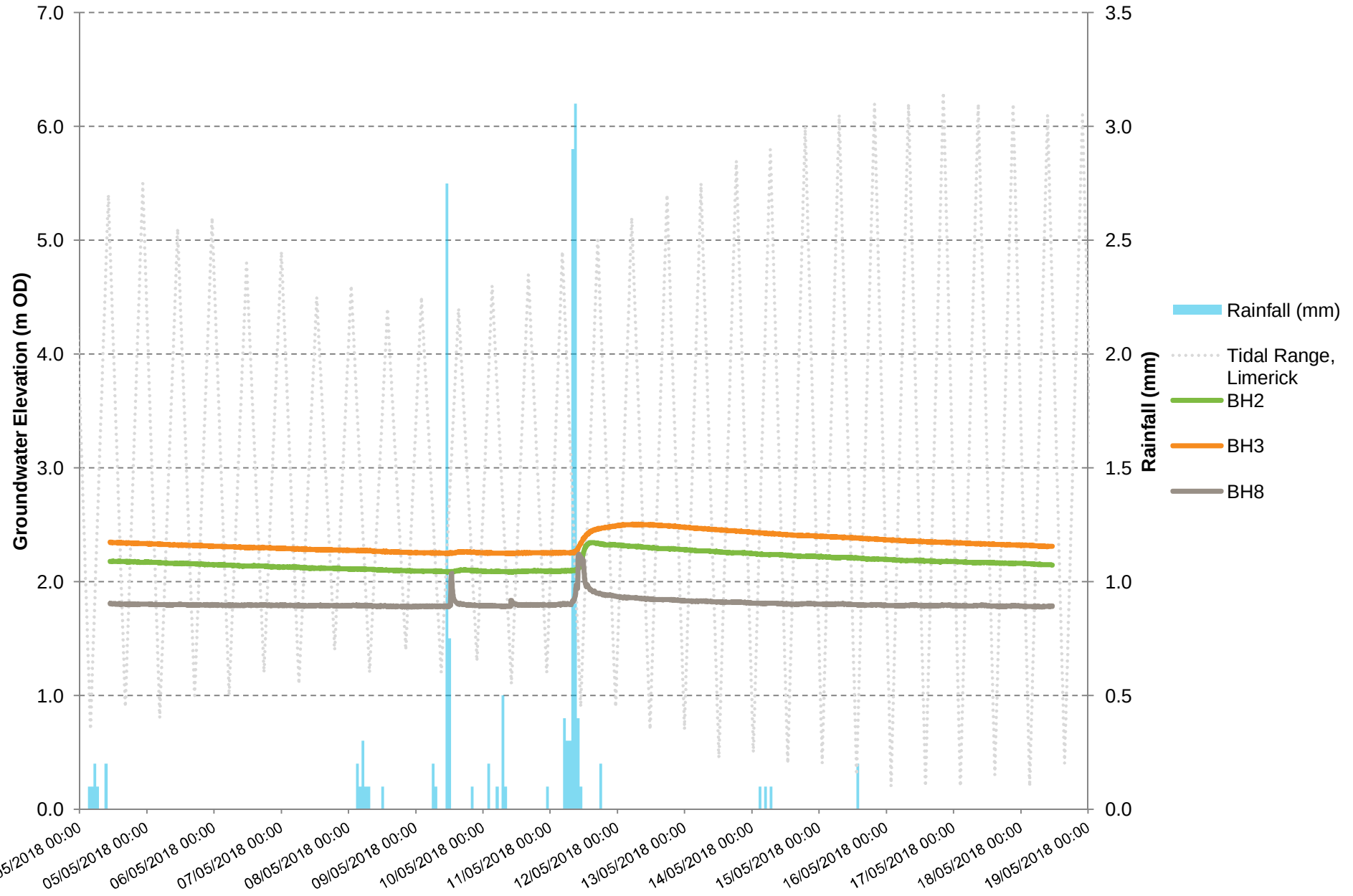
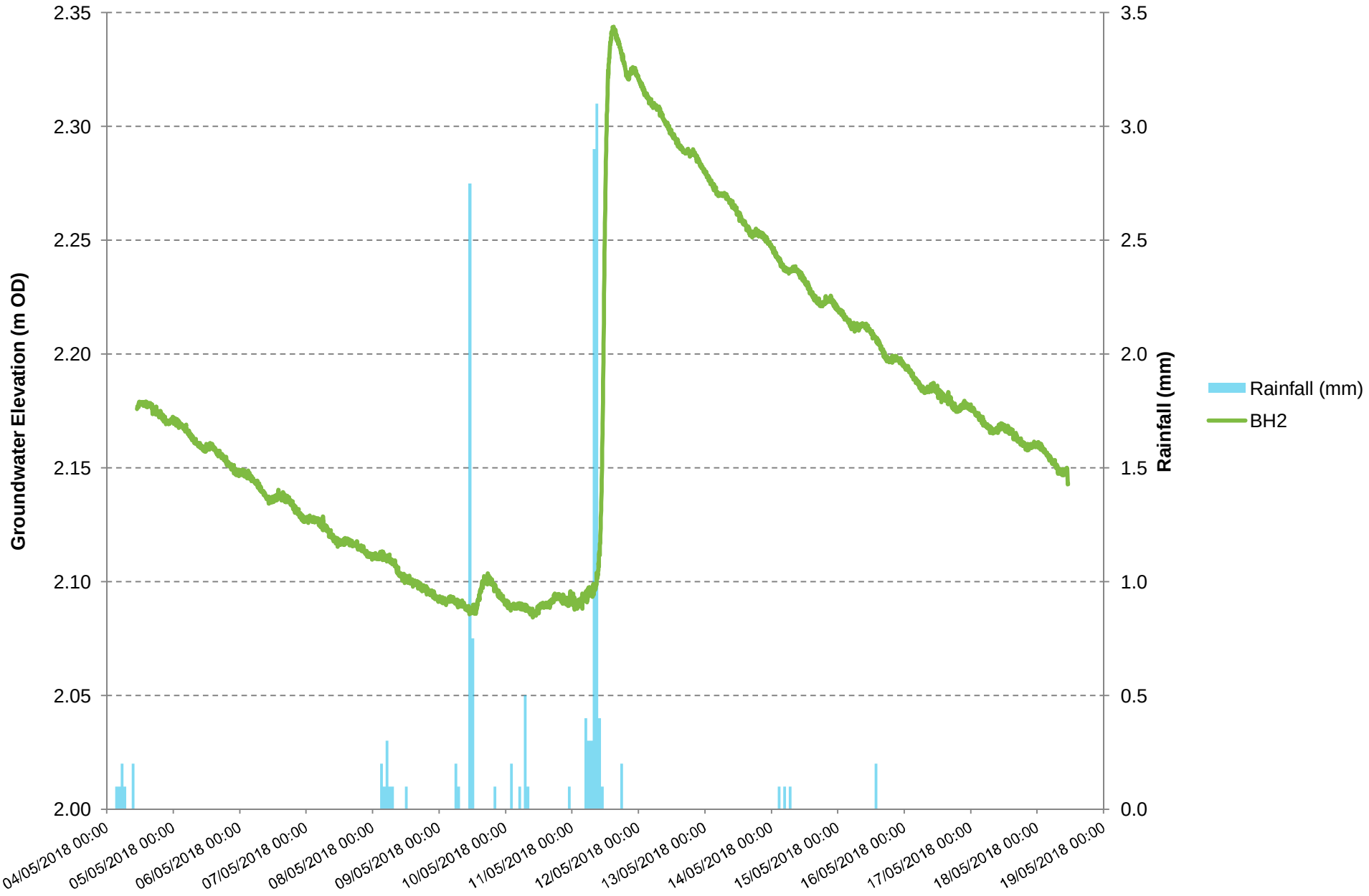
Appendix A Figure 5
Groundwater Elevation Responses to Tides and Rainfall in Selected Wells



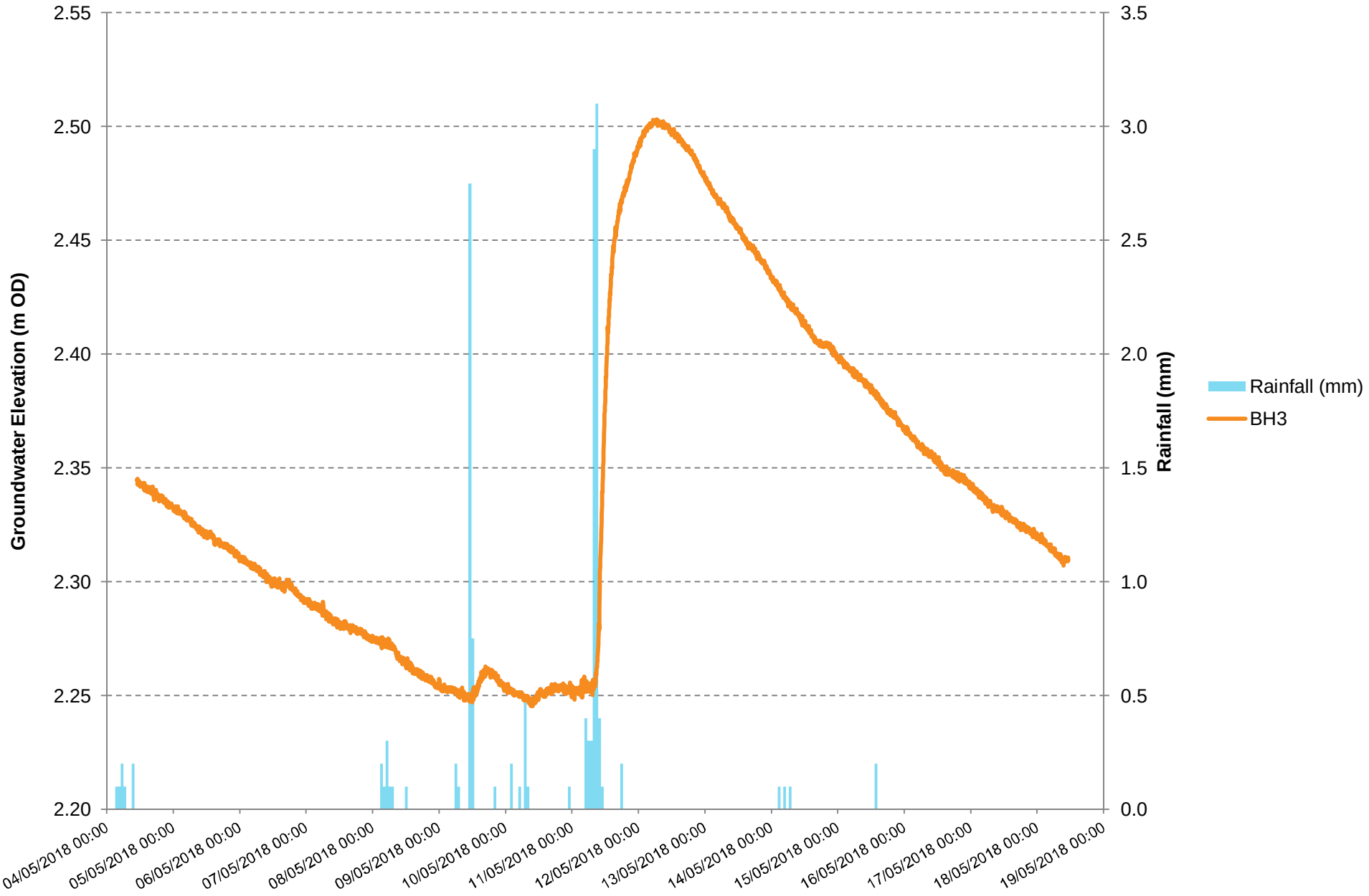
Rainfall Data: Met Eireann, https://www.met.ie/climate/available-data/daily-data
Tide Data: https://www.tidetimes.co.uk/limerick-dock-tide-times-20180504

Appendix A Figure 6
Groundwater Elevation Responses to Tides and Rainfall in Well BH2



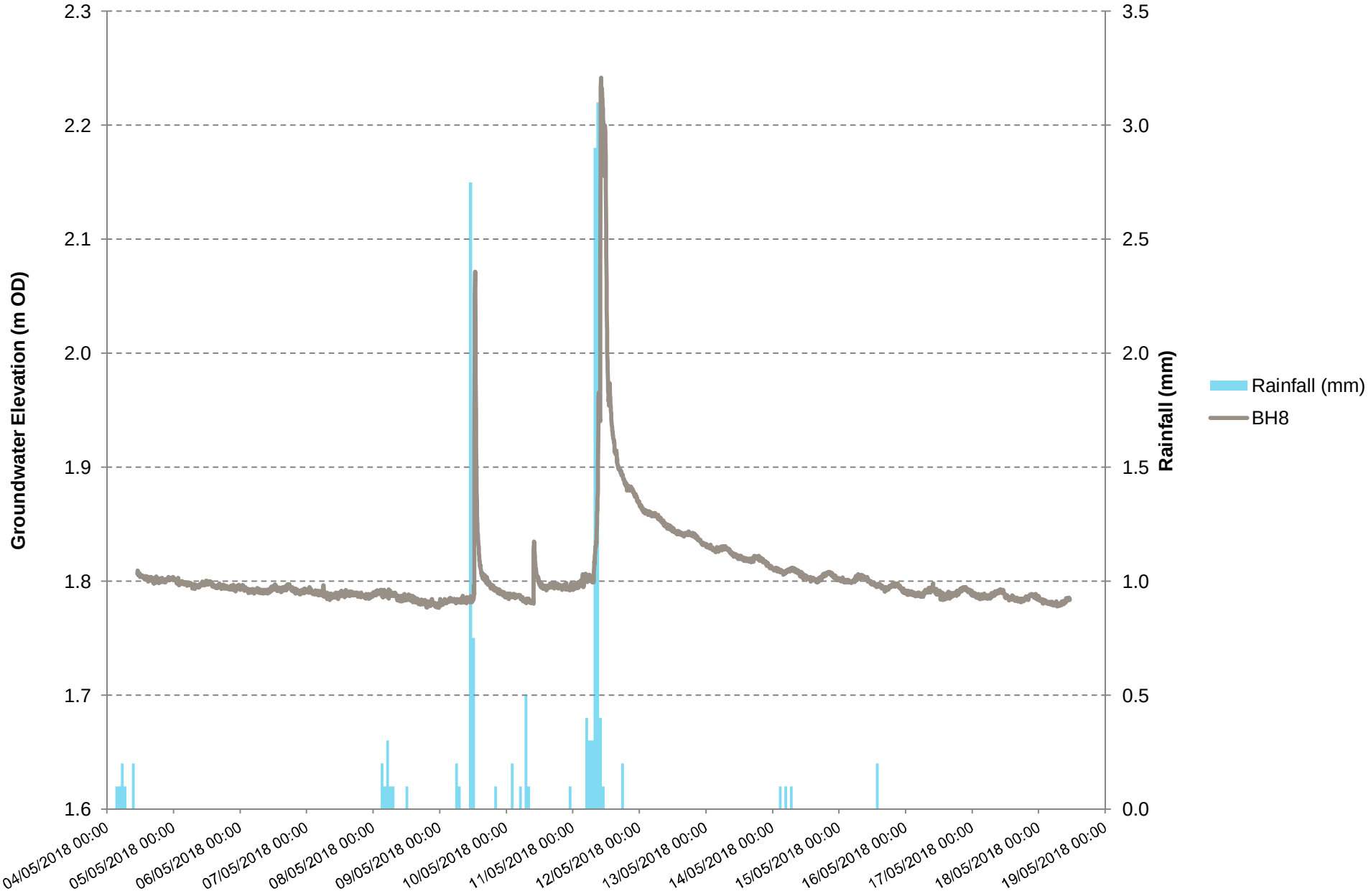
Rainfall Data: Met Eireann, https://www.met.ie/climate/available-data/daily-data

Appendix A Figure 7
Groundwater Elevation Responses to Tides and Rainfall in Well BH3



Rainfall Data: Met Eireann, https://www.met.ie/climate/available-data/daily-data

Appendix A Figure 8
Groundwater Elevation Responses to Tides and Rainfall in Well BH8



Rainfall Data: Met Eireann, https://www.met.ie/climate/available-data/daily-data

Appendix B Photographs

AECOM

PHOTOGRAPHIC LOG

Client Name: Limerick County Council	**Site Location:** Rutland Street, Limerick	**Project Number:** PR-289270

Photo No.	**Date:**
1	04/05/2018

Description:

Well BH1

Photo No.	**Date:**
2	18/05/2018

Description:

Wells BH3 and WS3

AECOM

PHOTOGRAPHIC LOG

Client Name: Limerick County Council	**Site Location:** Rutland Street, Limerick	**Project Number:** PR-289270

Photo No.	**Date:**
3	18/05/2018

Description:

Well BH4

Photo No.	**Date:**
4	18/05/2018

Description:

Well BH4 location

AECOM

PHOTOGRAPHIC LOG

Client Name: Limerick County Council	**Site Location:** Rutland Street, Limerick	**Project Number:** PR-289270

Photo No.	**Date:**
5	04/05/2018

Description:

Well BH5 – covered by tarmac

Photo No.	**Date:**
6	04/05/2018

Description:

Well BH5 – covered by tarmac

AECOM

PHOTOGRAPHIC LOG

Client Name: Limerick County Council	**Site Location:** Rutland Street, Limerick	**Project Number:** PR-289270

Photo No.	**Date:**
7	18/05/2018

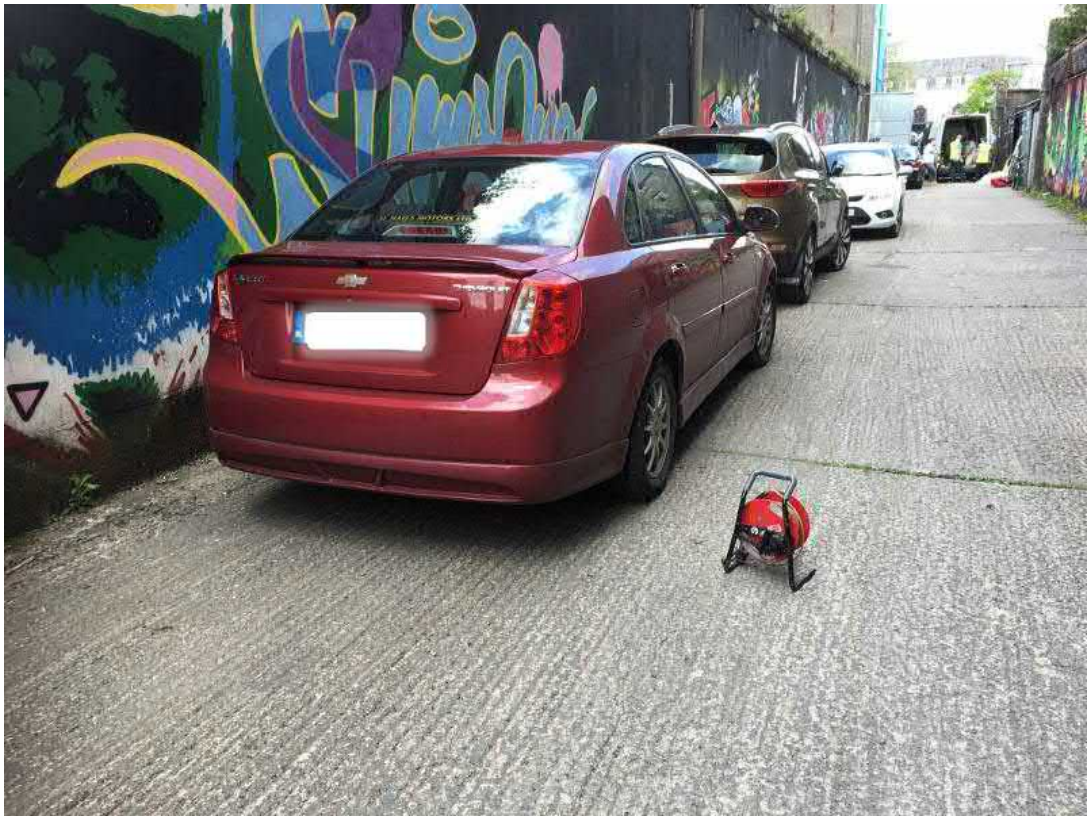
Description:

Survey equipment in Bogue's Yard

Photo No.	**Date:**
8	18/05/2018

Description:

Lane in which BH8 is located



Appendix C Table 1

Appendix C Table 1
Groundwater Elevations, May 2018

Well	Location Co-ordinate ITN		Location Co-ordinate ING		Elevation (m OD)		04-May-2018		18-May-2018	
	Easting	Northing	Easting	Northing	Ground	Top of Casing	Depth to Groundwater (m bct)	Groundwater Elevation (m OD)	Depth to Groundwater (m bct)	Groundwater Elevation (m OD)
BH1	557777.309	657285.778	157817.66	157242.114	3.69	3.60	dry	n/a	1.317	2.28
BH2	557776.237	657300.467	157816.588	157256.807	3.45	3.41	1.24	2.17	1.27	2.14
BH3	557805.940	657310.192	157846.297	157266.533	3.39	3.34	0.99	2.35	1.03	2.31
BH4	557801.567	657249.088	157841.924	157205.417	4.91	4.81	not found	n/a	1.48	3.33
BH5	not accessible		not accessible		not accessible		not accessible		not accessible	
BH8	557838.569	657361.083	157878.934	157317.436	3.69	3.67	1.85	1.82	n/a	n/a
WS3	557810.325	657308.815	157850.683	157265.157	3.36	3.31	not found	n/a	0.97	2.34

Notes
m OD - metres above Ordnance Datum
m bct - metres below casing top
n/a - not available

Edel O'Hannelly
Principal Hydrogeologist
M: 087 2887392
E: edel.ohannelly@aecom.com