Intended for
**Vantage Data Centers DUB11 Limited**

Date
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Project Number
**1620012232**

# VANTAGE – DUB11

# SITE CONDITION & BASELINE REPORT

RAMBOLL

# VANTAGE – DUB11
# SITE CONDITION & BASELINE REPORT

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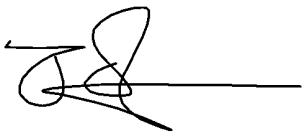



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# EXECUTIVE SUMMARY

This soil and groundwater baseline report has been completed as part of Vantage Data Centers DUB 11 Limited Industrial Emissions (IE) Licence application. The report has been prepared in compliance with European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions.

A Site Condition Report (SCR) has been prepared which considers the risks presented by the materials stored at the installation, the sensitivity of the receiving environment and the measures in place to mitigate the potential for ground contamination. The primary risk is derived from the storage and use of hydrotreated vegetable oil (HVO). Diesel is proposed as an alternative back-up fuel to HVO. All comments regarding HVO are equally applicable to diesel, except where otherwise stated. Measures are in place to minimise the risk of contamination of the ground and a Baseline Report has been prepared presenting the current condition of the ground at the installation.

A review of containment and mitigation measures at the facility confirms that the risk of a contamination event resulting in soil or ground water contamination is low. These measures include hard standing, adequate bunding, single skinned tanks, double skinned tanks, leak detection and overfill protection, double lined transfer lines, spill management procedures and oil interceptors on stormwater lines.

As the Installation is a new facility the operator proposes to implement an environmental management system to manage the environmental aspects of the operation of the Installation. The EMS will be designed to meet the requirements of ISO14001:2015. The installation is intended to replicate successful and proven technologies and processes already developed and in manufacture and use in existing facilities. The design team have assessed Best Available Techniques (BAT) and ensured compliance with the relevant BAT as a minimum requirement.

The site currently consists of mostly flat agricultural land with the land surrounding the site comprising a mixture of agricultural, residential and industrial uses. Several data centre developments are under construction or are operational located near the site.

Source-pathway-receptor linkages were assessed for the bulk storage areas. It was concluded that there are no direct pathways to either the soil or groundwater. Interceptors are installed on the surface water drainage. A leakage from a bulk tank would be fully contained in the designated bund or the double skin lining of the tank, with leaks during delivery fully contained within the continuous hard standing delivery area. Any leakage outside of the delivery area would be contained within the drainage system.

The data confirms that there is no evidence of extensive soil or groundwater contamination at the site due to previous use. The source pathway qualitative risk assessment concludes that the risk of an impact to soil or water is low.

# 1. INTRODUCTION

Ramboll UK Limited ("Ramboll") was commissioned by Vantage Data Centers DUB11 Limited (the "Client") to provide Industrial Emissions Licensing support in relation to the proposed development of 2 no. two-storey data centres and associated ancillary development on land within the townlands of Ballybane and Kilbride within Profile Park, Clondalkin, Dublin 22.

This site condition report is intended to satisfy the Irish Environmental Protection Agency's (EPA) request for such a report as part of the application for an Industrial Emissions (IE) Licence.

This report was completed in accordance with European Commission guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on Industrial Emissions.

### 1.1 Site Details

| | |
|---|---|
| Name of the applicant | Vantage Data Centers DUB11 Limited |
| Activity Address | Land within the townlands of Ballybane and Kilbride within Profile Park, Clondalkin, Dublin 22 |
| Irish Grid Reference | E303748, N230717 |
| Document reference and dates for Site Condition Report at permit application and surrender | Site Condition Report at Licence Application: 1620012232_1_Vantage DUB11 Site Condition Report, prepared by Ramboll UK Limited, May 2022 |
| Document references for site plans (including location and boundaries) | • Appendix 1 - Site Location Plan - 1620012232 Issue 1 Vantage DUB11, Figure 1<br>• Appendix 1 - Site Layout Plan - 1620012232 Issue 1 Vantage DUB11, Figure 2<br>• Appendix 1 - Site Drainage Plan –<br>• Appendix 1 – Previous exploratory hole locations (reproduced from third-party reports), Figure 4 |

The Installation comprises 2 two-storey data centres and a single-storey Multi-Fuel Generation Plant (MFGP) to supply electricity to the data centre. The data centre development will consist of the following primary aspects:

***Data centre and back-up electricity supply***

The data centre development will provide reliable and secure data storage for businesses and individuals. The data centre will have a peak electricity demand of 104.4 MWe. To ensure minimal service interruptions and the preservation of data integrity, a backup diesel powered electricity supply is planned to allow the site to operate for up to 24 hours in the event of a power disruption to the site.

The data centre is designed in two main sections:

- The northern Data Centre (DUB11) will comprise of a two-storey data center of 24,667 $m^2$. DUB11 will include 22 standby emergency generators with associated flues, each 22.3 m in height (95.95m AOD), located to the west of the building;
- The southern Data Centre (DUB12) will comprise a two-storey data center of 12,915 $m^2$. DUB12 will include 14 standby emergency generators with associated flues, each 22.3 m in height (95.95m AOD),and would be located to the west of the building.

The data centres are cooled with air handling units (AHUs) that are provided with chilled water via roof mounted free cooling magnetic bearing chillers. Chilled water would be pumped around the

building using variable volume pumps and the supply of chilled water will be managed to match the demand for each data centre.

***MFGP, Gas Pressure Reduction Station & ESB 110 kV Substation***

The data centre's equipment, including servers and the cooling equipment require power to maintain server availability and the necessary environmental conditions. Electrical power will be supplied via a connection to the Irish national grid, operated by Eirgrid. Due to a lack of capacity within the grid, a MFGP is required to ensure sufficient electricity is available for the operation of the data centre. The MFGP will be powered by eleven 9.78 MWe (21.4MWth) dual-fuel engines firing on natural gas or diesel/Hydrotreated Vegetable Oil (HVO). The engines will operate mainly on HVO during the first year of operation as the Irish gas network adjusts to the additional demand from the development, once sufficient gas supply is secured, the facility will operate on a combination of fuels based on availability and price. Each engine will have a selective catalytic reduction (SCR) flue gas treatment system installed for the reduction of oxides of nitrogen, carbon monoxide and hydrocarbon emissions.

The MFGP comprises:

- a northern plant,
- a southern plant.

Power for the proposed development would be provided by the MFGP from approximately Q4 2023 to Q1 2025 when the connection to the Gas Networks Ireland (GNI) gas connection becomes available. Initially, it is proposed that the MFGP will be powered using hydrotreated vegetable oil (HVO) until such time that the natural gas connection by GNI is available.

As part of the greener gas supply, at some point in the future it is understood that GNI is intending to decarbonise the gas network using a hydrogen/natural gas mix. The MFGP is designed to have the flexibility to operate effectively (subject to modifications) with up to 15% hydrogen blend.

Once the GNI gas supply is operational, it is intended that HVO would then switch to the primary back-up fuel for the MFGP, primarily coming into use when cost or availability constraints impact the feasibility of operating on natural gas. This approach will remain under review based around performance and availability of the fuel types.

### 1.2 Reliance and General Limitations

The conclusions presented in this report represent Ramboll UK Limited's best professional judgment based upon the information available and conditions existing as of the date of the review. In performing its assignment, Ramboll UK Limited must rely upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll Limited was accurate and complete. This review is not intended as legal advice, nor is it an exhaustive review of site conditions or facility compliance. Ramboll UK Limited makes no representations or warranties, express or implied, about the condition of the site.

# 2. METHODOLOGY

## 2.1 Methodology Outline

Table 5 of the Guidance (European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75 EU on industrial emissions), outlines the requirements for this report. These requirements form the methodology adopted for this report which is outlined below as Stages 1-8.

- Stage 1 – Identifying the potential hazardous substances that are currently used, produced or released at the site
- Stage 2 – Identifying the relevant hazardous substances i.e. those which have the potential to cause soil and groundwater contamination
- Stage 3 – Assessment of the site-specific pollution risk
- Stage 4 – Site History
- Stage 5 – Environmental Setting
- Stage 6 – Conceptual Site Model
- Stage 7 – Site Investigation – Soil & Water Quality Assessment
- Stage 8 – Production of the Baseline Report

## 2.2 Sources of Information

Reference is made in this report to information from a number of existing data sources and reports including the following:

- Specification – Diesel Generator, Burns McDonnell, 28 January 2022 (Ref. DUB11.1-DC-XX-Q004-V1-WS4-BMD)
- Fuel Oil System – Mechanical Specification, Burns McDonnell, 28 January 2022 (Ref. DUB11.1-RP-XX-M006-V1-WS4-BMD)
- Project DUB11 Draft Basis of Design, Burns McDonnell, 28 January 2022 (Ref. DUB11-DC-XX-G003-V1-WS4-BMD)
- Environmental Impact Assessment Report, Ramboll UK Limited, 03 March 2022 (Ref. 1620012232)
- Drawings, maps and plans provided by Vantage Data Centers.

## 2.3 Scope of Work

The scope of work undertaken for this assessment included the following:

- A desktop review of regional and site geology and hydrogeology.
- Review of available soil and groundwater quality data.
- Review of bulk liquid storage and assessment in terms of likely impact to receiving waters.
- Ground Investigation & Geotechnical Report.

# 3. STAGE 1&2 – IDENTIFYING SUBSTANCES OF CONCERN

The primary raw materials to be used in the planned facility are natural gas, hydrotreated vegetable oil (HVO) and diesel (for emergency generators), lubricants and coolants. All materials are provided with suitable secondary and tertiary containment measures.

Bunded above ground tanks will be constructed for the storage of SCR Urea (3 x 50m$^3$ and 2 x 75m$^3$ tanks), lubricating oil (2x20m$^3$ and 2x 15m$^3$) and Diesel fuel (36 x 18m$^3$) with offload points located in kerbed areas to contain any spillages.

HVO will be stored in 24 underground tanks (80m$^3$ each), which are set within a concrete-lined basement to provide protection and containment of potential leaks. The basement is accessible to allow for inspection and maintenance of the tanks.

Other chemicals (e.g. lube oil for generator maintenance) which could be hazardous to the environment are kept in smaller quantities (such as drums and IBCs) will be stored under cover and on appropriately rated secondary containment.

**Table 3.1: Materials hazardous to the environment stored on site**

| Chemical/ Material | Reason for use | State (Solid/ Liquid / Gas) | Estimated Annual Use | Potential Environmental Risks |
|---|---|---|---|---|
| Diesel Fuel | Back up generator fuel | Liquid | 1,200 m³ | H411: Toxic to aquatic life with long lasting effects. |
| Lubricating Oil | Engine lubricant | Liquid | Dependent on Engine oil volume and change frequency | H412 Harmful to aquatic life with long lasting effects |
| Glycol/ Water | Engine coolant | Liquid | 15 m³ | Not classified for environmental hazards |
| Urea/ Water | SCR additive | Liquid | 3,100 m$^3$ | Not Classified for environmental hazards |
| Corrosion Inhibitor | Cooling water treatment for engines | Liquid | <5m$^3$ | H412 Harmful to aquatic life with long lasting effects |
| Hydrotreated Vegetable Oil | Fuel for MFGP | Liquid | 265,000 m³ | H304: May be fatal if swallowed and enters airways. |

A summary of the planned bulk storage at the proposed facility is outlined below.

**Fuel Oil**

Fuel oil will be stored in thirty-six bunded above ground tanks with a capacity of 18m$^3$ with offload points located in kerbed areas to contain any spillages. The tanks supply the diesel generators at the data centre in the event of a failure of supply from the MFGP or from the mains supply.

Smaller volumes of fuel oil are also used for the firewater pumps (18 x1m$^3$ tanks).

**Lubricating Oil**

Lubricating oil will be stored in two bunded above ground tanks with a capacity of 20m$^3$ with offload points located in kerbed areas to contain any spillages. The tanks support the operation of the engines at the MFGP. A further two tanks of 15m$^3$ will be present to store used lubricating oil prior to filtering and reuse.

**Urea**

Urea will be stored in five bunded above ground tanks (3 x 56m$^3$ and 2 x 76.8m$^3$) with offload points located in kerbed areas to contain any spillages. The SCR system is used for control of nitrogen oxides (NOx), Carbon Monoxide (CO) and Hydrocarbon emissions. In the SCR process, nitrogen oxides are reduced with the help of a reducing agent to nitrogen ($N_2$) and water vapour ($H_2O$), which are major components of the ambient air. The SCR reducing agent is an aqueous urea solution (typically 35%) which is injected into the flue gas stream prior to entry into the SCR chamber.

**Hydrotreated Vegetable Oil (HVO)**

HVO will be stored in twenty-four underground tanks (85m$^3$), which are set within a concrete-lined underground storage facility to provide protection and containment of potential leaks. The underground storage facility has a capacity of 2,496m$^3$ (120% of the HVO storage capacity) and will have a 1% slope towards the west, directing any loss of containment towards an accessible sump adjacent to the plant building. Anchoring is used to prevent potential flotation in the event of high groundwater levels. The tanks will be compliant to the standards EN 14015, API 650, BS 2654, DIN 4119, NEN 3850, CPR9-3, BS 2594 or BS 4994.

The data centre equipment including servers and cooling equipment require power. Electrical power will be supplied via the Irish National Grid. Due to lack of capacity within the grid a MFGP is required to ensure sufficient electricity is available for the operation of the data centre, this will consist of Natural Gas/HVO duel-fuel engines. Initially, it is proposed that the Multi-Fuel Generation Plant (MFGP) will be powered using hydrotreated vegetable oil (HVO) until such time that the natural gas connection by GNI is available.

# 4. STAGE 3 – ASSESSMENT OF SITE-SPECIFIC POLLUTION RISK

This includes a review of the containment measures proposed for potential hazardous substances and potential conduits for migration at the site.

## 4.1 Containment Systems and Procedures

The following containment arrangements are planned to be in place at the site to prevent any accidental release:

- Bulk storage tanks are located within a suitably sized concrete bund or double skinned tanks.
- Leak detection and overfill protection installed.
- All run-off from the bund and delivery area is routed through an oil interceptor prior to discharge from site. Seven oil interceptors (class 1 by-pass interceptor) are to be installed serving high risk areas as well as permeable paving and silt traps in lower risk areas.
- A network of pipelines is to be installed across the site to collect stormwater form the hardstanding and roof areas and divert to a total of five attenuation ponds allowing an attenuation capacity of 2,391m$^3$.
- In the event of a fire, run off from the road and hard stand area drain direct to the attenuation pond which can be shut off until sampling is undertaken to determine whether water is suitable for discharge or requires appropriate disposal.
- Environmental Management System in line with ISO14001:2015.

A site drainage plan is included within Appendix 1.

## 4.2 Wastewater

Foul drainage will be collected from the data centre and MFGP welfare facilities and discharged to the local foul drainage network which is ultimately treated by Ringsend wastewater treatment plant.

The operation of the MFGP and backup generator does not generate process wastewater as part of normal operations.

## 4.3 Summary of Stages 1 -3

Stages 1-3 of the Baseline Assessment have concluded that the Vantage Data Centers DUB11 Limited development will comprise 45 above ground bulk storage tanks and 24 below ground storage tanks which have potential to be hazardous to the environment. There re sufficient containment measures in place to ensure that the risk to soil and water environments is minimised.

# 5. STAGE 4 - SITE HISTORY

**Prior Use**

This section includes an evaluation of the likelihood of the presence of any contamination on soil/groundwater at the site an overview of the site history.

**Table 5.1: Site history**

| Conditions | Source | Description |
|---|---|---|
| **Historical Land Uses** | Historical mapping from Ordnance Survey Ireland (OSI)[1] | The site has been in agricultural use since the earliest available mapping (1837-1842). |
| **Current Site Activities** | Google Earth™ Aerial imagery | The site currently consists of mostly flat agricultural land with the land surrounding the site comprising a mixture of agricultural, residential and industrial uses. There are two residential properties located near the site on the northern site boundary adjacent to the R134 New Nangor Road, one of which is vacant and within the site and one of which is occupied to the immediate north-east of the site. Bolands Car Centre (a motor sales business) is present to the immediate west of the site. Several data centre developments are under construction or are operational located near the site. |
| **Pollution Incidents** | N/A | No known pollution incidents have taken place at the site. |
| **Waste Management Facilities** | EPA Spatial Maps | According to the EPA, there are several licensed Integrated Pollution Prevention and Control (IPPC) and waste facilities in the vicinity; however, these are located approximately 3km from the site.<br>Information gained from surrounding planning applications indicates that there are no known illegal or historical landfills within 500m of the site; however, it is understood that uncontrolled waste operations are undertaken at the adjacent car centre. |
| **Environmental Permits** | EPA Spatial Maps | There is a record of an Industrial Emissions Licensing (IEL) Facility located approximately 740m north-east of the site, registered to Pfizer (pharmaceuticals company). The Pfizer site was previously an Integrated Pollution Prevention and Control Site.<br>There are no Integrated Pollution Control facilities licensed by the EPA within a 2km radius.<br>A Section 4 Discharge License is held by Google Ireland Ltd 260m south-east.<br>There are no EPA licensed Waste Facilities located within 2km of the site. |

[1] https://webapps.geohive.ie/mapviewer/index.html

# 6. STAGE 5 – ENVIRONMENTAL SETTING

This section includes an assessment of the likely fate of any spill/leak event based on the topography, soil and groundwater characteristics at the location.

The table below provides a description of the site's environmental setting from a review of publicly available information and previous third-party site investigation reports.

**Table 6.1: Environmental Setting**

| Conditions | Source / Supporting Information | Description |
|---|---|---|
| **Geology** | Geological Survey Ireland (GSI) Spatial Resources[2]<br>IGSL 2021 Site Investigation[3]. | Information on the geology underlying the site and the area surrounding the site was obtained from electronic mapping from Geological Survey Ireland (GSI) Spatial Resources and available borehole records from a 2021 site investigation undertaken by IGSL.<br>The mapping indicates that the site is underlain by Quaternary Glacial Till Deposits and the Lucan Formation which comprises dark grey to black limestone and shale (also known as Dinantian (Upper Impure) Limestone or Calp Limestone). It is also anticipated that topsoil and Made Ground will be present across the site.<br>The following ground conditions were encountered during a site investigation undertaken by IGSL in May 2021:<br>• TOPSOIL consisting of brown slightly sandy silty CLAY / SILT with occasional rootlets;<br>• Glacial Till – firm mottled grey and brown sandy gravelly CLAY / SILT with a medium cobble content;<br>• Glacial Till – stiff to very stiff dark grey very gravelly SILT / CLAY with a medium cobble content.<br>• Variably weathered rockhead recovered as dark grey clayey silty GRAVEL shy of trial pit termination. Gravel and cobbles range from medium strong limestone to weak mudstone or shale; and<br>• Bedrock consisting of dark grey and black LIMESTONE with thin horizons of fissile SHALE or MUDSTONE. |
| **Hydrogeology** | GSI Spatial Resources<br>IGSL 2021 investigation | According to the GSI National Draft Bedrock Aquifer Map the bedrock is classified as Dinantian Limestones (Calp). The GSI has classified this aquifer as Locally Important (Ll), i.e. an aquifer which is moderately productive only in local zones. Groundwater underlying the site is classified by the Water Framework Directive (WFD) as being of 'good status'. The Aquifer vulnerability is considered to be high (H) with the overlying subsoils being of low permeability.<br>The site is not located within a Groundwater Drinking Water Protection Area or Groundwater Special Protection Area and there are no wells or springs within 1km of the site. |

[2] https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228
[3] IGSL Ltd, Ground Investigation Report, Project Apollo, July 2021 (Ref. 23300)

| Conditions | Source / Supporting Information | Description |
|---|---|---|
| | | During the 2021 ground investigation, groundwater strikes or seepages were encountered in each of the trial pits excavated and in a number of cable percussive boreholes. In the case of the trial pits, groundwater was reported as seepages at depths mainly between 1.2-1.9m below ground level (bgl). In cable percussive boreholes, groundwater was intercepted at depths of 1.6-2.4m bgl in six boreholes, while the remainder were noted to be dry. Where groundwater was absent, this was considered to be attributed to potential seepages of the casing's sealing. Groundwater was intercepted at depths of 2.5m, 2.6m and 3.0m bgl during rotary drilling while the standpipes showed resting groundwater levels between 0.97-1.89m bgl in late June 2021.<br>Groundwater is considered likely to be in continuity with the Baldonnel stream which runs through the northern portion of the site, with a likely groundwater flow direction towards the north. |
| **Hydrology** | Ordnance Survey mapping<br>Environmental Protection Agency (EPA) Water Maps[4]<br>Office of Public Works (OPW) Flood Maps[5] | The site is situated within the sub-catchment of the Griffeen River and Baldonnel Stream which are tributaries of the River Liffey. The Baldonnel Stream runs approximately east to west through the northern portion of the site. Further surface water features are present within the Grange Castle Golf Club situated approximately 400m to the south-east of the site.<br>Currently, the EPA classifies the Baldonnel Stream and Griffeen River as being under review. A review of WFD waterbody status (2013-2018) indicates that the Baldonnel Stream is classified as having 'moderate' status. The nearest EPA monitoring stations are at Baldonnel Stream (RS09B090400) located 200m west of the site, downstream of Bolands Garage, and at Griffeen (RS09G010200), located approximately 1km west of the site. The latest EPA biological assessment of surface water from the latter location indicated a score of Q3 (poor) in 1991.<br>According to the OPW, the site does not lie within an area susceptible to either fluvial (river) or pluvial (surface water) flooding. |
| **Ecological Designated Sites** | EPA Spatial Maps[6] | The Grand Canal is located approximately 2km north of the site and is classified as a proposed National Heritage Area (NHA). No other statutory designated ecologically sensitive sites are located in a 2km radius. |
| **Topography** | Google Earth™ | The site is relatively flat. |

[4] https://gis.epa.ie/EPAMaps/Water

[5] https://www.floodinfo.ie/map/floodmaps/

[6] https://gis.epa.ie/EPAMaps/

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|---|---|---|
| **Evidence of Historical Contamination** | Historical Mapping from OSI | No potentially significant sources of on-site contamination have been identified.<br>An intrusive investigation has undertaken at the site in 2021, the findings are summarised below. |
| **Previous Reporting** | Report reproduced in Appendix 3 & 4 | *Ground Investigation & Geotechnical Report – IGSL Ltd, July 2021, Ref. 23300; and*<br>*Contaminated Land Interpretative Report – Ramboll UK Limited, August 2021, ref. 1620012232.*<br>The ground investigation was completed by IGSL in May 2021 (and interpreted by Ramboll), and comprised the following:<br>• Trial pits (13 No.);<br>• Cable percussive boreholes (17 No.);<br>• Rotary core boreholes (3 No.) installed with groundwater monitoring wells;<br>• Plate load tests (13 No.);<br>• Soakaway / infiltration tests (3 No.);<br>• Geophysical survey (in-situ resistivity);<br>• Groundwater monitoring; and<br>• Surveying of exploratory locations.<br>Soil samples were submitted for a range of determinands. No particular types of potential contaminants were identified from the current and historical use of the site, and therefore the IGSL investigation included a typical contaminated land chemical testing suite comprising of; heavy metals, petroleum hydrocarbons, asbestos, organic contaminants such as polycyclic aromatic hydrocarbons (PAHs).<br>Groundwater samples were retrieved from three locations and surface water samples from two locations on one occasion, and sent to the laboratory for chemical analysis for the determinands including heavy metals and hydrocarbons.<br>No visual or olfactory observations of contamination were noted.<br>The soil analytical results obtained during the ground investigations have been screened against the Ramboll Generic Assessment Criteria (GAC) for commercial/industrial end use suitable for assessment of the proposed data center use. A total of 13 soil samples were analysed for a range of metals, PAHs, TPH and PCBs. The results were screened against the appropriate GAC, and all measured concentrations were below the GAC indicating no significant risks to human health from soils for the proposed site use.<br>A total of three groundwater samples and two surface water samples were retrieved and analysed for a suite of metals and hydrocarbons. In addition, 13 soil samples were analysed for leachable contaminants including pH, ammonium and benzo(j)fluoranthene. None of the leachate data exceeded the GAC, suggesting the soils on |

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|---|---|---|
| **Evidence of Historical Contamination** | Historical Mapping from OSI | No potentially significant sources of on-site contamination have been identified.<br>An intrusive investigation has undertaken at the site in 2021, the findings are summarised below. |
| | | Site does not present a significant source of contamination to the water environment.<br>The groundwater and surface water sample data were very similar, and identified only cyanide and nickel above the GAC. Nickel was recorded marginally in exceedance of the bioavailable GAC for 4µg/l in both shallow ground and surface water samples. The maximum nickel concentration recorded was 5.9µg/l in one of the surface water samples. In order to calculate the bioavailable fraction from the measured concentrations, additional site-specific parameters are needed which were not included in the analytical suite. However, typically the bio accessible fraction would be less than half, which would suggest this nickel impact will not pose a significant risk to the water environment.<br>The slightly elevated cyanide concentrations recorded are consistent across the site in both groundwater and surface water. No cyanide was recorded in soils above the laboratory method detection limit, indicating there is no source of cyanide on site. The impact may be a result of off-site diffuse contamination or natural background concentrations. As the cyanide concentrations are only approximately double the Drinking Water Standards (DWS) and there is no on-site source of cyanide in the site soils, it is considered that these levels are not significant in the context of the site as they most likely reflect background concentrations.<br>No significant soil or groundwater impacts were identified which may pose a risk to human health or the water environment based on the data available and the current development proposals. In the absence of any contamination sources, no further risk assessment is considered to be required by Ramboll. |
| **Baseline Soil and Groundwater Reference Data** | Previous reporting.<br>Soil and groundwater chemical data summarised in Appendix 5. | Base line soil and groundwater reference data has been obtained from the 2021 site investigation.<br>For the purposes of this SCR, hydrocarbons, urea and glycol are considered to be the only 'relevant hazardous substances' which will be in use at the site.<br>Based on this, the SCR presents baseline reference data for contaminants which have the potential to be associated with the site's historical uses, and also with the current / future storage of diesel fuel and glycol; namely hydrocarbons and VOCs including:<br>• Speciated total petroleum hydrocarbons (TPH-CWG) in the carbon range C5 to C44 (aliphatic and aromatic compounds);<br>• Total polycyclic aromatic hydrocarbons (PAHs);<br>• Volatile aromatic hydrocarbons (VOCs) including benzene, toluene, ethylbenzene and xylenes (BTEX). |

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| **Evidence of Historical Contamination** | Historical Mapping from OSI | No potentially significant sources of on-site contamination have been identified.<br>An intrusive investigation has undertaken at the site in 2021, the findings are summarised below. |
| | | Glycols were not analysed as part of the previous investigations, as they had not been identified as a contaminant of concern based on former site uses. Glycols are readily biodegradable in soil and groundwater and would not be anticipated to be a persistent contaminant.<br>*Groundwater flow*<br>Groundwater strikes or seepages were encountered in each of the trial pits and in a number of cable percussive boreholes. In the case of the trial pits, groundwater was recorded as seepages at depths mainly between 1.2 and 1.9m. In the cable percussion boreholes, groundwater was intercepted at depths of 1.6m to 2.4m. In the rotary boreholes, groundwater strikes were recorded between 2.5m and 3.0m bgl.<br>Shallow groundwater flow is considered likely to be in continuity with the Baldonnel stream which runs through the northern portion of the site, with a likely groundwater flow towards the north.<br>*Soil Baseline Reference Data*<br>Laboratory certificates are presented with the previous reports in Appendix 11.<br>In summary, across the site as a whole:<br>• Concentrations of total TPH were not recorded above the laboratory detection limit in all samples analysed.<br>• BTEX was below laboratory reporting limits in all samples analysed.<br>• Total PAH was below laboratory reporting limits in all samples analysed.<br>*Groundwater Baseline Reference Data*<br>• Concentrations of Total TPH were below reporting limits in all samples analysed.<br>• BTEX was not included in the suite of determinands.<br>• Concentrations of 16 PAHs were below reporting limits in all samples analysed. |
| **Supporting information and sources** | See next column | • Geological Survey Ireland Spatial Resources geological mapping at https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228<br>• EPA Water Maps at https://gis.epa.ie/EPAMaps/Water<br>• EPA Spatial Maps at https://gis.epa.ie/EPAMaps/<br>• Historical mapping from OSI at https://webapps.geohive.ie/mapviewer/index.html<br>• Site location plan and layout plan reproduced in Appendix 1, Figure 1 and 2 respectively |

| | | |
|---|---|---|
| **Evidence of Historical Contamination** | Historical Mapping from OSI | No potentially significant sources of on-site contamination have been identified.<br>An intrusive investigation has undertaken at the site in 2021, the findings are summarised below. |
| | | • Site drainage plan reproduced in Appendix 1<br>• Environmental Risk Assessment in Appendix 6<br>Previous reports reproduced in Appendix 7:<br>• IGSL Ltd, Ground Investigation & Geotechnical Report, July 2021 (ref. 23300)<br>• Ramboll UK Limited, Contaminated Land Interpretative Report, August 2021 (ref. 1620012232) |

# 7. STAGE 6 – CONCEPTUAL SITE MODEL

A summary of the conceptual site model (CSM) is described below:

- The profile on site comprises superficial Glacial Till deposits overlying the low permeability Lucan Formation.
- Depth to groundwater varies from 1.6 to 3.0m bgl across the site.
- There is no evidence of historical soil contamination.
- There are no groundwater dependent terrestrial ecosystems which have potential to be impacted by the proposed development.
- The only hazard proposed for the development is bulk HVO (underground), diesel and urea storage tanks which will be fully contained in bunds and all underground lines will be double lined.

The pollutant linkages based on the primary sources of possible contaminants on site are summarised in the table below:

| **Source** | **Pathways** | **Receptor** | **Impact Assessment** |
|---|---|---|---|
| Spillage of hazardous materials including HVO, diesel and urea. | Vertical and lateral migration via shallow overburden to underlying bedrock<br><br>Lateral migration via groundwater within the bedrock aquifer | Locally Important Bedrock Aquifer with high to moderate vulnerability | Low – tanks are bunded and double skinned and on hard stand areas with interceptors on the drainage system providing tertiary control |

# 8. STAGE 7 – SITE INVESTIGATION AND BASELINE SOIL /WATER QUALITY ASSESSMENT

Site investigations were undertaken in 2021 by IGSL Ltd ref 23300 *Ground Investigation & Geotechnical Report*. Locations for trial holes and boreholes and laboratory results are presented in the summary report provided in Appendix 4.

The investigations did not identify any evidence of soil or groundwater contamination as a result of previous use of the site.

# 9. CONCLUSIONS

On the basis of the soil and groundwater investigations undertaken prior to the construction the Vantage Data Centers DUB11 facility and an assessment of source-pathway receptors the following conclusions have been made:

- A review of soil and water quality confirms that there is no evidence of any residual contamination beneath the site.
- There is bulk storage proposed for the facility. However the risk prevention measures planned at the facility significantly reduce the potential for an environmental impacts to soil or water to occur. These measures include bunded and double-skinned tanks, tanks, spill management procedures, maintenance, and environmental management systems.
- Source-pathway-receptor linkages were assessed for the bulk storage areas. It was concluded that there are no direct pathways to either the soil or groundwater. Interceptors are installed on the surface water drainage. A leakage from a bulk tank would be fully contained in the designated bund or the double skin lining of the tank, with leaks during delivery fully contained within the continuous hard standing delivery area. Any leakage outside of the delivery area would be contained within the drainage system.

# APPENDIX 1
# FIGURES

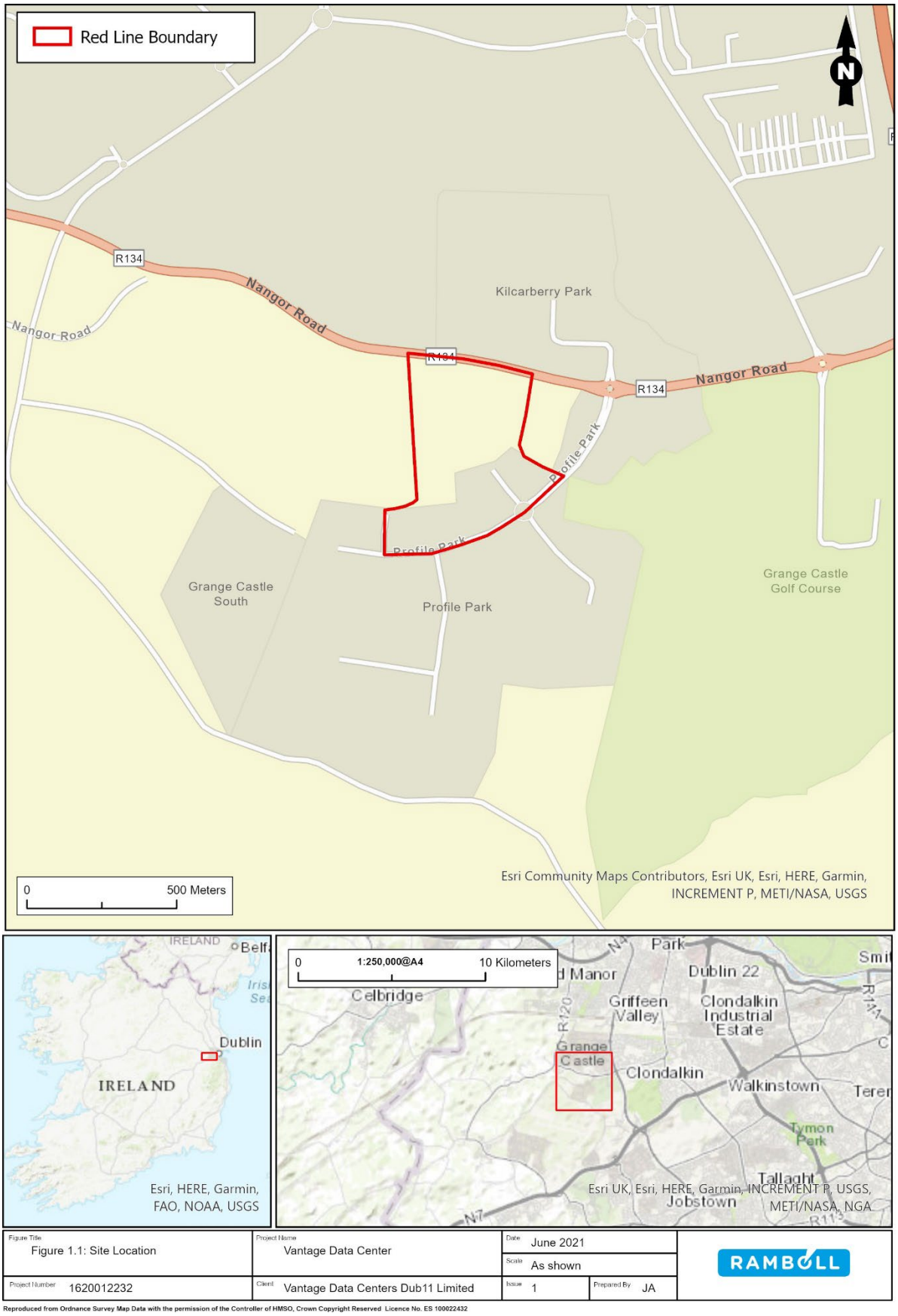
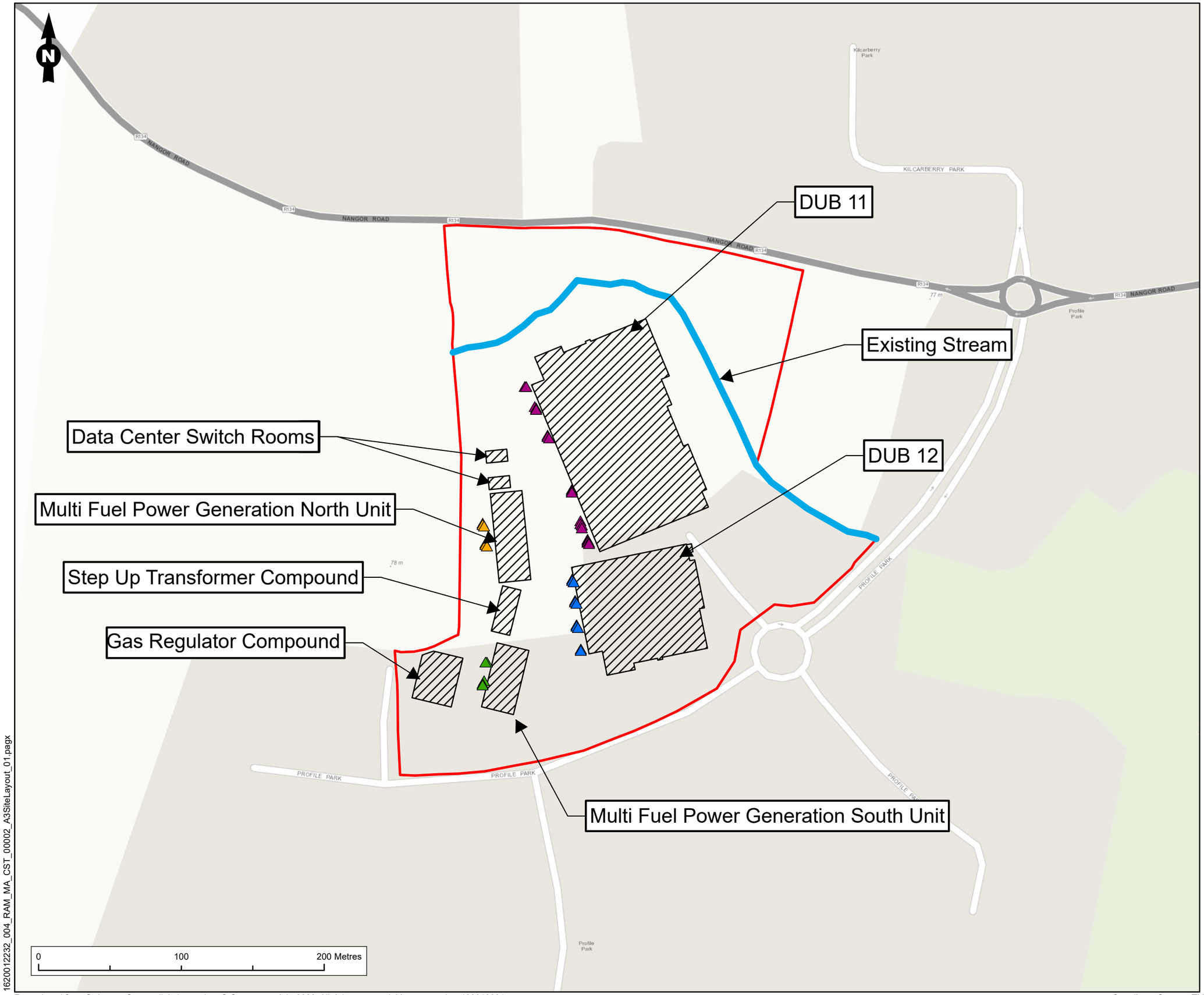



**Figure 1: Site Location**




## Legend

- Site Boundary
- Proposed Building Outlines
- Existing Stream
- Air Emissions Point – A2-1 to A2-6
- Air Emissions Point – A2-7 to A2-11
- Air Emissions Point – A3-1 to A3-22
- Air Emissions Point – A3-23 to A2-35

| | |
|---|---|
| Figure Title | Site Layout |
| Project Name | Vantage DUB Environmental Permitting Support |
| Project Number | 1620012232-004 |
| Figure No. | 2 |
| Date | February 2023 |
| Prepared By | WR |
| Scale | 1:2,500 @A3 |
| Issue | 1 |
| Client | **Vantage Data Centres** |

RAMBOLL

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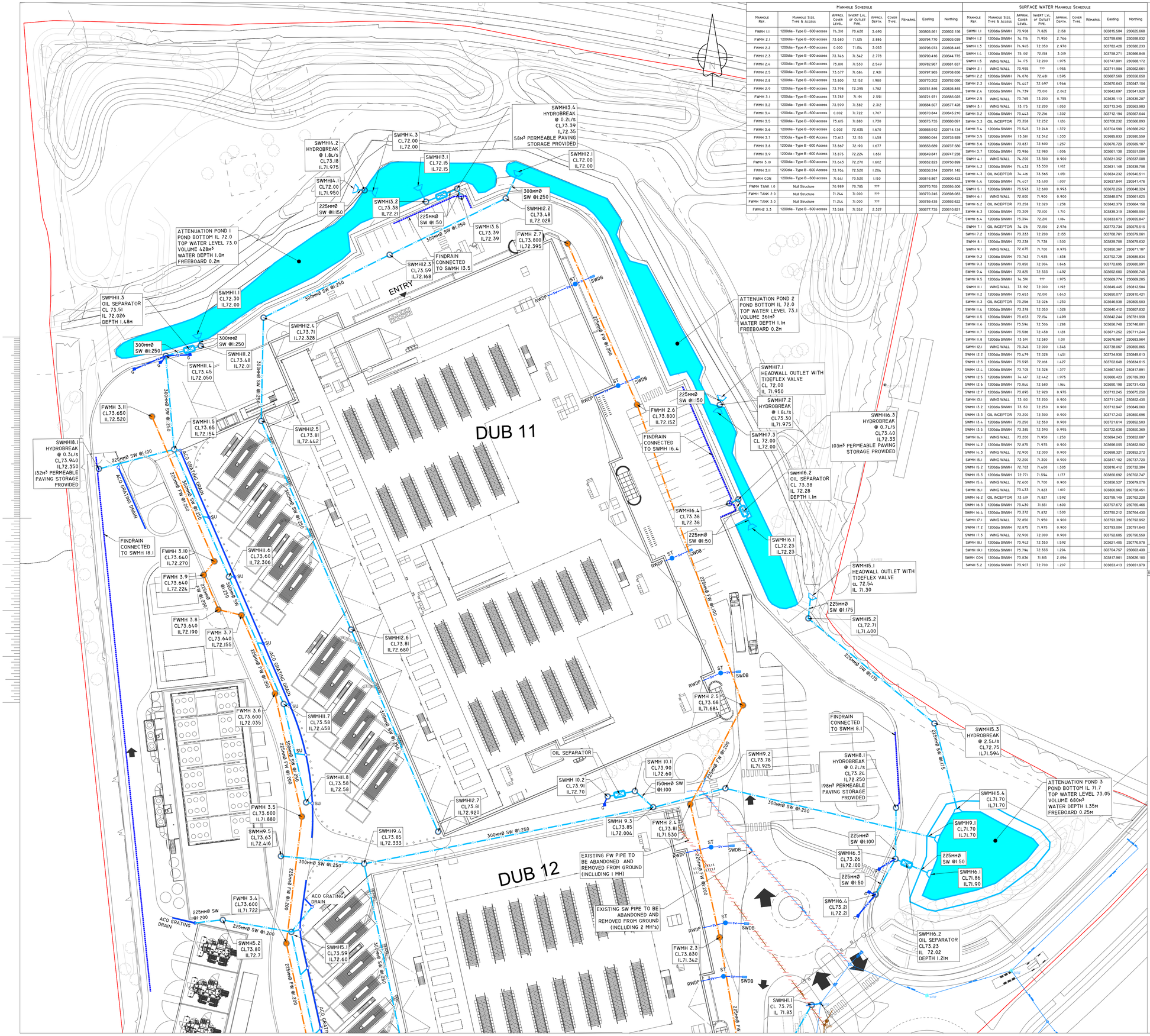
Coordinate System: TM65 Irish Grid. Projection: Transverse Mercator. Datum: TM65.




Millimeters

Inches

Scale For Microfilming

## Manhole Schedule

| Manhole Ref. | Manhole Size, Type & Access | Approx. Cover Level. | Invert Lvl. of Outlet Pipe. | Approx. Depth. | Cover Type. | Remarks. | Easting | Northing |
|---|---|---|---|---|---|---|---|---|
| FWMH 1.1 | 1200da - Type B - 600 access | 74.310 | 70.620 | 3.690 | | | 303803.561 | 230602.156 |
| FWMH 2.1 | 1200da - Type B - 600 access | 73.680 | 71.125 | 2.886 | | | 303794.770 | 230603.039 |
| FWMH 2.2 | 1200da - Type A - 600 access | 0.000 | 71.154 | 5.053 | | | 303796.073 | 230608.445 |
| FWMH 2.3 | 1200da - Type B - 600 access | 73.746 | 71.342 | 2.778 | | | 303790.416 | 230644.775 |
| FWMH 2.4 | 1200da - Type B - 600 access | 73.801 | 71.530 | 2.549 | | | 303782.967 | 230681.637 |
| FWMH 2.5 | 1200da - Type B - 600 access | 73.677 | 71.684 | 2.921 | | | 303797.965 | 230708.656 |
| FWMH 2.8 | 1200da - Type B - 600 access | 73.800 | 72.152 | 1.980 | | | 303770.202 | 230792.090 |
| FWMH 2.9 | 1200da - Type B - 600 access | 73.798 | 72.595 | 1.782 | | | 303751.846 | 230836.845 |
| FWMH 3.1 | 1200da - Type B - 600 access | 73.782 | 71.191 | 2.591 | | | 303721.971 | 230585.025 |
| FWMH 3.2 | 1200da - Type B - 600 access | 73.599 | 71.382 | 2.312 | | | 303684.507 | 230577.428 |
| FWMH 3.4 | 1200da - Type B - 600 access | 0.002 | 71.722 | 1.707 | | | 303670.844 | 230645.210 |
| FWMH 3.5 | 1200da - Type B - 600 access | 73.615 | 71.880 | 1.750 | | | 303675.735 | 230680.091 |
| FWMH 3.6 | 1200da - Type B - 600 access | 0.002 | 72.035 | 1.670 | | | 303668.912 | 230714.134 |
| FWMH 3.7 | 1200da - Type B - 600 access | 73.613 | 72.155 | 1.458 | | | 303660.044 | 230735.929 |
| FWMH 3.8 | 1200da - Type B - 600 access | 73.867 | 72.190 | 1.677 | | | 303653.689 | 230737.580 |
| FWMH 3.9 | 1200da - Type B - 600 access | 73.875 | 72.224 | 1.651 | | | 303649.841 | 230747.238 |
| FWMH 3.10 | 1200da - Type B - 600 access | 73.643 | 72.270 | 1.602 | | | 303652.823 | 230750.899 |
| FWMH 3.11 | 1200da - Type B - 600 access | 73.704 | 72.520 | 1.206 | | | 303636.314 | 230791.145 |
| FWMH CON | 1200da - Type B - 600 access | 71.641 | 70.520 | 1.150 | | | 303816.867 | 230600.423 |
| FWMH TANK 1.0 | Null Structure | 70.989 | 70.785 | ??? | | | 303770.765 | 230595.506 |
| FWMH TANK 2.0 | Null Structure | 71.244 | 71.000 | ??? | | | 303770.245 | 230598.083 |
| FWMH TANK 3.0 | Null Structure | 71.244 | 71.000 | ??? | | | 303759.435 | 230592.622 |
| FWMH 3.3 | 1200da - Type B - 600 access | 73.588 | 71.552 | 2.327 | | | 303677.735 | 230610.821 |

## Surface Water Manhole Schedule

| Manhole Ref. | Manhole Size, Type & Access | Approx. Cover Level. | Invert Lvl. of Outlet Pipe. | Approx. Depth. | Cover Type. | Remarks. | Easting | Northing |
|---|---|---|---|---|---|---|---|---|
| SWMH 1.1 | 1200da SWMH | 74.908 | 71.825 | 2.158 | | | 303815.504 | 230625.668 |
| SWMH 1.2 | 1200da SWMH | 74.716 | 71.950 | 2.766 | | | 303799.696 | 230598.832 |
| SWMH 1.3 | 1200da SWMH | 74.945 | 72.050 | 2.970 | | | 303782.426 | 230580.233 |
| SWMH 1.4 | 1200da SWMH | 75.102 | 72.158 | 3.019 | | | 303758.271 | 230566.848 |
| SWMH 1.5 | WING WALL | 74.175 | 72.200 | 1.975 | | | 303747.501 | 230568.172 |
| SWMH 2.1 | WING WALL | 73.955 | ??? | 1.955 | | | 303711.904 | 230562.661 |
| SWMH 2.2 | 1200da SWMH | 74.076 | 72.481 | 1.595 | | | 303687.569 | 230556.650 |
| SWMH 2.3 | 1200da SWMH | 74.447 | 72.697 | 1.966 | | | 303670.643 | 230547.154 |
| SWMH 2.4 | 1200da SWMH | 74.759 | 73.010 | 2.062 | | | 303642.697 | 230541.928 |
| SWMH 2.5 | WING WALL | 73.765 | 73.200 | 0.755 | | | 303635.113 | 230535.287 |
| SWMH 3.1 | WING WALL | 73.175 | 72.200 | 1.050 | | | 303713.345 | 230563.983 |
| SWMH 3.2 | 1200da SWMH | 73.443 | 72.216 | 1.502 | | | 303712.194 | 230567.644 |
| SWMH 3.3 | OIL INCEPTOR | 73.358 | 72.232 | 1.126 | | | 303708.232 | 230566.893 |
| SWMH 3.4 | 1200da SWMH | 73.545 | 72.248 | 1.372 | | | 303704.599 | 230566.252 |
| SWMH 3.5 | 1200da SWMH | 73.581 | 72.342 | 1.333 | | | 303685.833 | 230580.559 |
| SWMH 3.6 | 1200da SWMH | 73.837 | 72.600 | 1.237 | | | 303670.729 | 230589.107 |
| SWMH 3.7 | 1200da SWMH | 73.986 | 72.980 | 1.006 | | | 303661.138 | 230551.004 |
| SWMH 4.1 | WING WALL | 74.200 | 73.300 | 0.900 | | | 303631.352 | 230537.088 |
| SWMH 4.2 | 1200da SWMH | 74.432 | 73.330 | 1.102 | | | 303631.148 | 230539.756 |
| SWMH 4.3 | OIL INCEPTOR | 74.416 | 73.565 | 1.051 | | | 303634.232 | 230540.511 |
| SWMH 4.4 | MANHOLE BACKDROP | 74.407 | 73.400 | 1.007 | | | 303637.844 | 230541.476 |
| SWMH 5.1 | 1200da SWMH | 73.593 | 72.600 | 0.993 | | | 303672.259 | 230648.324 |
| SWMH 6.1 | WING WALL | 72.800 | 71.900 | 0.900 | | | 303848.074 | 230661.625 |
| SWMH 6.2 | OIL INCEPTOR | 73.258 | 72.020 | 1.238 | | | 303842.379 | 230664.158 |
| SWMH 6.3 | 1200da SWMH | 73.309 | 72.100 | 1.710 | | | 303839.319 | 230665.554 |
| SWMH 6.4 | 1200da SWMH | 73.396 | 72.210 | 1.186 | | | 303833.673 | 230665.847 |
| SWMH 7.1 | OIL INCEPTOR | 74.126 | 72.150 | 2.976 | | | 303773.734 | 230579.515 |
| SWMH 7.2 | 1200da SWMH | 73.535 | 72.200 | 2.153 | | | 303768.761 | 230579.061 |
| SWMH 8.1 | 1200da SWMH | 73.238 | 71.738 | 1.500 | | | 303839.708 | 230679.632 |
| SWMH 9.1 | WING WALL | 72.675 | 71.700 | 0.975 | | | 303850.367 | 230671.187 |
| SWMH 9.2 | 1200da SWMH | 73.765 | 71.925 | 1.838 | | | 303792.728 | 230685.834 |
| SWMH 9.3 | 1200da SWMH | 73.850 | 72.004 | 1.846 | | | 303772.695 | 230680.991 |
| SWMH 9.4 | 1200da SWMH | 73.825 | 72.333 | 1.492 | | | 303692.680 | 230666.748 |
| SWMH 9.5 | 1200da SWMH | 74.596 | ??? | 1.975 | | | 303669.774 | 230669.285 |
| SWMH 11.1 | WING WALL | 73.192 | 72.000 | 1.192 | | | 303649.445 | 230812.584 |
| SWMH 11.2 | 1200da SWMH | 73.653 | 72.010 | 1.643 | | | 303650.077 | 230810.421 |
| SWMH 11.3 | OIL INCEPTOR | 73.256 | 72.026 | 1.230 | | | 303646.936 | 230809.503 |
| SWMH 11.4 | 1200da SWMH | 73.378 | 72.050 | 1.328 | | | 303640.412 | 230807.832 |
| SWMH 11.5 | 1200da SWMH | 73.653 | 72.154 | 1.499 | | | 303642.244 | 230781.958 |
| SWMH 11.6 | 1200da SWMH | 73.594 | 72.306 | 1.288 | | | 303656.748 | 230746.601 |
| SWMH 11.7 | 1200da SWMH | 73.586 | 72.458 | 1.128 | | | 303671.252 | 230711.244 |
| SWMH 11.8 | 1200da SWMH | 73.591 | 72.580 | 1.011 | | | 303676.967 | 230683.964 |
| SWMH 12.1 | WING WALL | 73.345 | 72.000 | 1.345 | | | 303738.067 | 230855.865 |
| SWMH 12.2 | 1200da SWMH | 73.479 | 72.028 | 1.451 | | | 303734.936 | 230849.613 |
| SWMH 12.3 | 1200da SWMH | 73.595 | 72.168 | 1.427 | | | 303702.648 | 230834.615 |
| SWMH 12.4 | 1200da SWMH | 73.705 | 72.328 | 1.377 | | | 303667.543 | 230817.891 |
| SWMH 12.5 | 1200da SWMH | 74.417 | 72.442 | 1.975 | | | 303666.423 | 230789.393 |
| SWMH 12.6 | 1200da SWMH | 73.846 | 72.690 | 1.156 | | | 303690.198 | 230731.433 |
| SWMH 12.7 | 1200da SWMH | 73.895 | 72.920 | 0.975 | | | 303713.245 | 230675.250 |
| SWMH 15.1 | WING WALL | 73.100 | 72.200 | 0.900 | | | 303711.245 | 230852.435 |
| SWMH 15.2 | 1200da SWMH | 73.150 | 72.250 | 0.900 | | | 303712.947 | 230849.060 |
| SWMH 15.3 | OIL INCEPTOR | 73.200 | 72.300 | 0.900 | | | 303717.240 | 230850.696 |
| SWMH 15.4 | 1200da SWMH | 73.250 | 72.350 | 0.900 | | | 303721.614 | 230852.503 |
| SWMH 15.5 | 1200da SWMH | 73.385 | 72.390 | 0.995 | | | 303722.638 | 230850.369 |
| SWMH 16.1 | WING WALL | 73.200 | 71.950 | 1.250 | | | 303694.243 | 230852.687 |
| SWMH 16.2 | 1200da SWMH | 72.875 | 71.975 | 0.900 | | | 303696.055 | 230852.502 |
| SWMH 16.3 | WING WALL | 72.900 | 72.000 | 0.900 | | | 303698.321 | 230852.272 |
| SWMH 16.1 | WING WALL | 72.200 | 71.300 | 0.900 | | | 303817.102 | 230737.720 |
| SWMH 16.2 | 1200da SWMH | 72.705 | 71.400 | 1.305 | | | 303816.412 | 230732.304 |
| SWMH 16.3 | 1200da SWMH | 72.771 | 71.594 | 1.177 | | | 303850.692 | 230702.747 |
| SWMH 16.4 | WING WALL | 72.600 | 71.700 | 0.900 | | | 303856.527 | 230679.076 |
| SWMH 16.1 | WING WALL | 73.433 | 71.823 | 1.610 | | | 303800.963 | 230758.451 |
| SWMH 16.2 | OIL INCEPTOR | 73.419 | 71.827 | 1.592 | | | 303799.149 | 230762.228 |
| SWMH 16.3 | 1200da SWMH | 73.430 | 71.831 | 1.600 | | | 303797.672 | 230765.466 |
| SWMH 16.4 | 1200da SWMH | 73.372 | 71.872 | 1.500 | | | 303795.212 | 230764.430 |
| SWMH 17.1 | WING WALL | 72.850 | 71.950 | 0.900 | | | 303793.390 | 230792.952 |
| SWMH 17.2 | 1200da SWMH | 72.875 | 71.975 | 0.900 | | | 303793.004 | 230791.640 |
| SWMH 17.3 | WING WALL | 72.900 | 72.000 | 0.900 | | | 303792.685 | 230790.559 |
| SWMH 18.1 | 1200da SWMH | 73.942 | 72.350 | 1.592 | | | 303621.405 | 230776.978 |
| SWMH 19.1 | 1200da SWMH | 73.796 | 72.333 | 1.204 | | | 303704.757 | 230603.439 |
| SWMH CON | 1200da SWMH | 73.836 | 71.815 | 2.096 | | | 303817.961 | 230626.100 |
| SWMH 5.2 | 1200da SWMH | 73.907 | 72.700 | 1.207 | | | 303653.413 | 230651.979 |

Design originator:

BURNS McDONNELL

10 Bishops Square, London E1 6AO, United Kingdom

www.burnsmcd.com/locations/London

www.burnsmcd.com/services

## LEGEND

- PROPOSED PRIVATE SURFACE WATER SEWER
- PROPOSED PRIVATE FOUL SEWER
- EXISTING PRIVATE FOUL WATER SEWER
- EXISTING PRIVATE SURFACE WATER SEWER
- EXISTING PUBLIC FOUL SEWER
- EXISTING PUBLIC SURFACE WATER SEWER
- MANHOLE BACKDROP
- DRAINAGE CHANNEL
- DRAINAGE RUN TO BE ABANDONED
- INTERNAL FOUL GULLY PIPE
- ROAD GULLY
- RODDING EYE
- SW DISTRIBUTION BOX (SWDB)
- SILT TRAP (ST)
- 1500 SURFACE WATER SEWER
- SUMP UNIT WITH RODDABLE AIR TRAP
- SOIL VENT PIPE
- STUB STACK
- AIR ADMITTANCE VALVE
- FOUL INTERCEPTOR TRAP
- RAINWATER DOWNPIPE
- SIPHONIC RAINWATER DOWNPIPE
- 69.200 PROPOSED LEVEL
- 69.200 EXISTING TIE IN LEVEL
- +67.72 EXISTING LEVEL
- SITE BOUNDARY
- ATTENUATION POND

DRAINAGE NOTES:

1. ALL FOUL SEWERS, MANHOLES AND CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE AND IRISH WATER WASTEWATER INFRASTRUCTURE STANDARD DETAILS.
2. ALL FOUL SEWER HOUSE CONNECTIONS TO BE MIN 100mmØ UPVC TO IS EN 1401 2009/2012, STIFFNESS CLASS 8KN/M2 IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
3. ALL PUBLIC FOUL SEWERS TO BE MINIMUM 225mm DIAMETER THERMOPLASTIC STRUCTURED WALL PIPES TO IS EN 13746 (2007/2009), TYPE SN8 AND WIS 4-35-01 (2008) AND COMPLY WITH THE REQUIREMENTS OF THE IRISH WATER CODE OF PRACTICE.
4. ALL PUBLIC SURFACE WATER SEWERS TO BE MINIMUM 225 DIA. CLASS H CONCRETE TO EN1916 & IS 6 2004 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
5. ALL SURFACE WATER CONNECTIONS TO BE MINIMUM 150mmØ UPVC TO IS EN 1401 2009/2012 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
6. LOCATION AND INVERT LEVELS OF EXISTING MANHOLES OR OUTFALL POINTS, WHERE APPLICABLE TO BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF DRAINAGE WORKS.
7. ALL FOUL CONNECTIONS TO COMPLY WITH THE REQUIREMENTS OF IRISH WATER.
8. ALL FOUL SEWERS TO BE AIR TESTED IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
9. ALL COVER LEVELS TO MATCH FINISHED ROAD/VERGE/FOOTPATH/CYCLETRACK LEVELS UNLESS OTHERWISE STATED.
10. CONTRACTOR TO INCLUDE FOR CCTV SURVEY OF ALL SEWERS UPON COMPLETION OF SAME.

NOTE:

1. REFER TO DRAWING DUBII.1-DR-XX-C504-V2-WS4-PIN & DUBII.1-DR-XX-C509-V2-WS4-PIN FOR FOUL AND SURFACE WATER DETAILS

| Rev. | Rev. Date | Drawn By | Checked By | Description |
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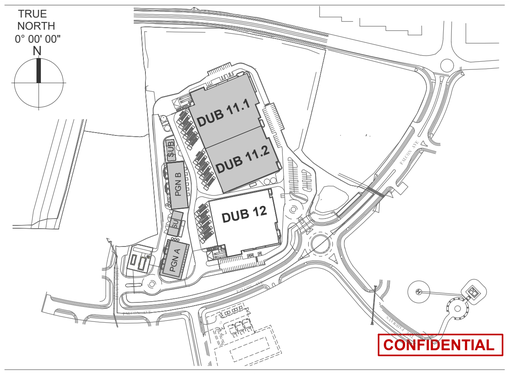


Client: VANTAGE

Architect: HYPHEN ARCHI IRELAND LTD, Unit G2, Aviemore House, Hill Street, Monaghan, H18 H528, Republic of Ireland

Mechanical/ Electrical/ Public Health/ Automation/ Telecoms/ Security /Fire Protection Engineer: BURNS McDONNELL, BURNS & McDONNELL, 10 Bishops Square, London E1 6AO, United Kingdom

Structure/ Civils Engineer: PINNACLE CONSULTING ENGINEERS, PINNACLE CONSULTING ENGINEERS, Alchemy, Bessemer Rd, Welwyn Garden City, AL7 1HE, United Kingdom

| BIM coordinator: | Approved by: | Checked by: | Drawn by: |
|---|---|---|---|
| | JM | S'OR | FJVR |

Project address:

Profile Park, Dublin 22, Ireland
53° 19' 1.40"N 6° 26' 40.80"W

Drawing title:

PROPOSED DRAINAGE LAYOUT
SHEET 1 OF 2

Sheet number: **C127**

| Format / Size: | Scale: | Status: | Date: | File Code: | Rev: |
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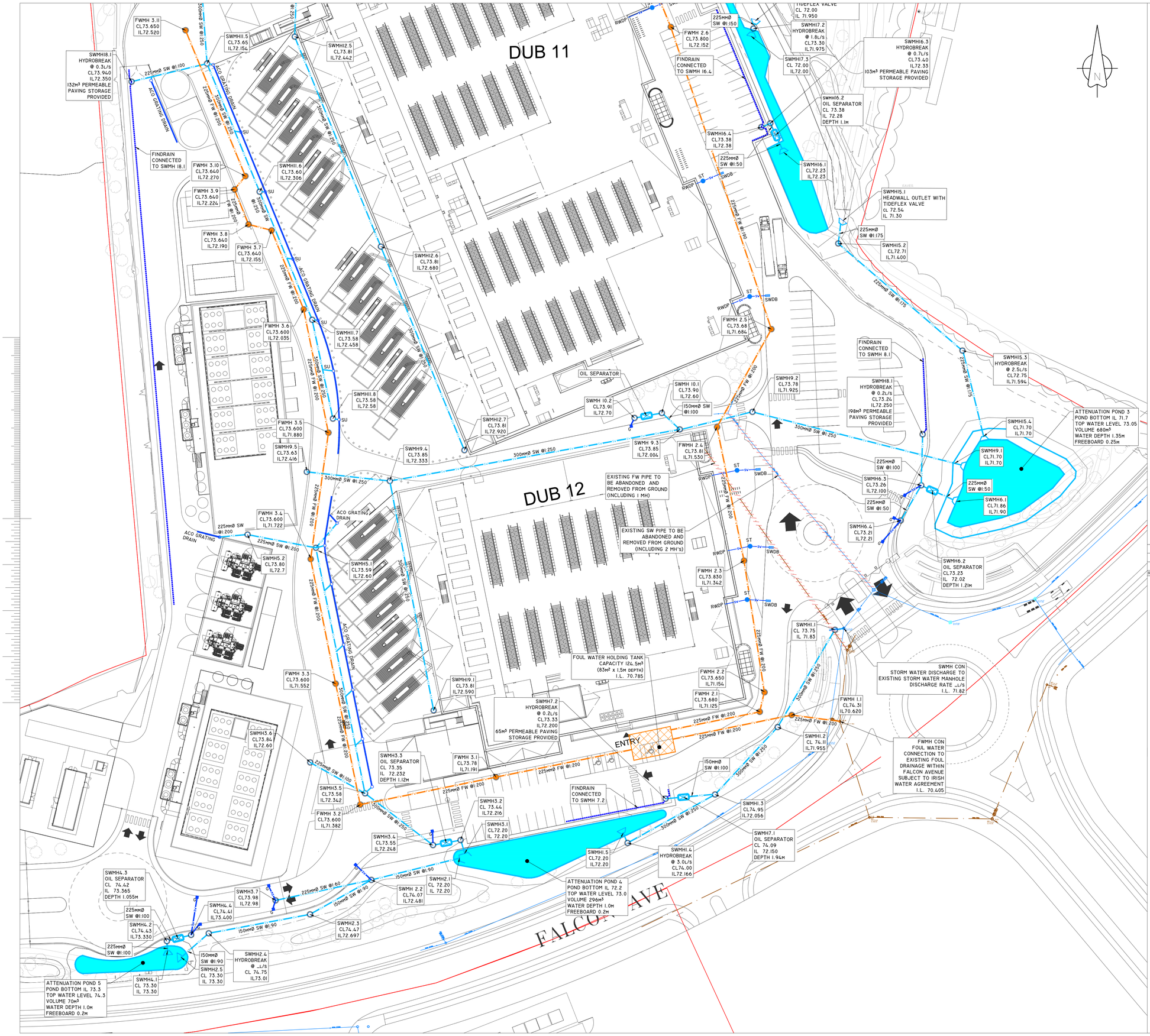


Scale For Microfilming

Millimeters

Inches

Design originator:

BURNS McDONNELL

10 Bishops Square, London E1 6AO, United Kingdom

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www.burnsmcd.com/services

## LEGEND

- PROPOSED PRIVATE SURFACE WATER SEWER
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- DRAINAGE RUN TO BE ABANDONED
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- ROAD GULLY (G)
- RODDING EYE (RE)
- SW DISTRIBUTION BOX (SWDB)
- SILT TRAP (ST)
- ISOD SURFACE WATER SEWER
- SUMP UNIT WITH RODDABLE AIR TRAP (SU)
- SOIL VENT PIPE (SVP)
- STUB STACK (SS)
- AIR ADMITTANCE VALVE (AAV)
- FOUL INTERCEPTOR TRAP (FIT)
- RAINWATER DOWNPIPE (RWP)
- SIPHONIC RAINWATER DOWNPIPE (SRWP)
- PROPOSED LEVEL 69.200
- EXISTING TIE IN LEVEL 69.200
- EXISTING LEVEL + 67.72
- SITE BOUNDARY
- ATTENUATION POND

DRAINAGE NOTES:

1. ALL FOUL SEWERS, MANHOLES AND CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE AND IRISH WATER WASTEWATER INFRASTRUCTURE STANDARD DETAILS.
2. ALL FOUL SEWER HOUSE CONNECTIONS TO BE MIN 100mmØ UPVC TO IS EN 1401 2009/2012, STIFFNESS CLASS 8KN/M2 IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
3. ALL PUBLIC FOUL SEWERS TO BE MINIMUM 225mm DIAMETER THERMOPLASTIC STRUCTURED WALL PIPES TO IS EN 13746 (2007/2009), TYPE SN8 AND WIS 4-35-01 (2008) AND COMPLY WITH THE REQUIREMENTS OF THE IRISH WATER CODE OF PRACTICE.
4. ALL PUBLIC SURFACE WATER SEWERS TO BE MINIMUM 225 DIA. CLASS H CONCRETE TO EN1916 & IS 6 2004 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
5. ALL SURFACE WATER CONNECTIONS TO BE MINIMUM 150mmØ UPVC TO IS EN 1401 2009/2012 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
6. LOCATION AND INVERT LEVELS OF EXISTING MANHOLES OR OUTFALL POINTS, WHERE APPLICABLE TO BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF DRAINAGE WORKS.
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10. CONTRACTOR TO INCLUDE FOR CCTV SURVEY OF ALL SEWERS UPON COMPLETION OF SAME.

NOTE:

I. REFER TO DRAWING DUBII.I-DR-XX-C504-V2-WS4-PIN & DUBII.I-DR-XX-C509-V2-WS4-PIN FOR FOUL AND SURFACE WATER DETAILS

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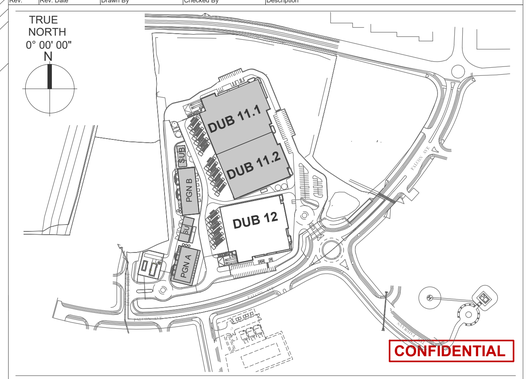


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Mechanical/ Electrical/ Public Health/ Automation/ Telecoms/ Security /Fire Protection Engineer: BURNS McDONNELL, BURNS & McDONNELL, 10 Bishops Square, London E1 6AO, United Kingdom

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| BIM coordinator: | Approved by: | Checked by: | Drawn by: |
|---|---|---|---|
| | JM | S'OR | FJVR |

Project address:

Profile Park, Dublin 22, Ireland
53° 19' 1.40"N 6° 26' 40.80"W

Drawing title:

PROPOSED DRAINAGE LAYOUT
SHEET 2 OF 2

Sheet number: **C128**

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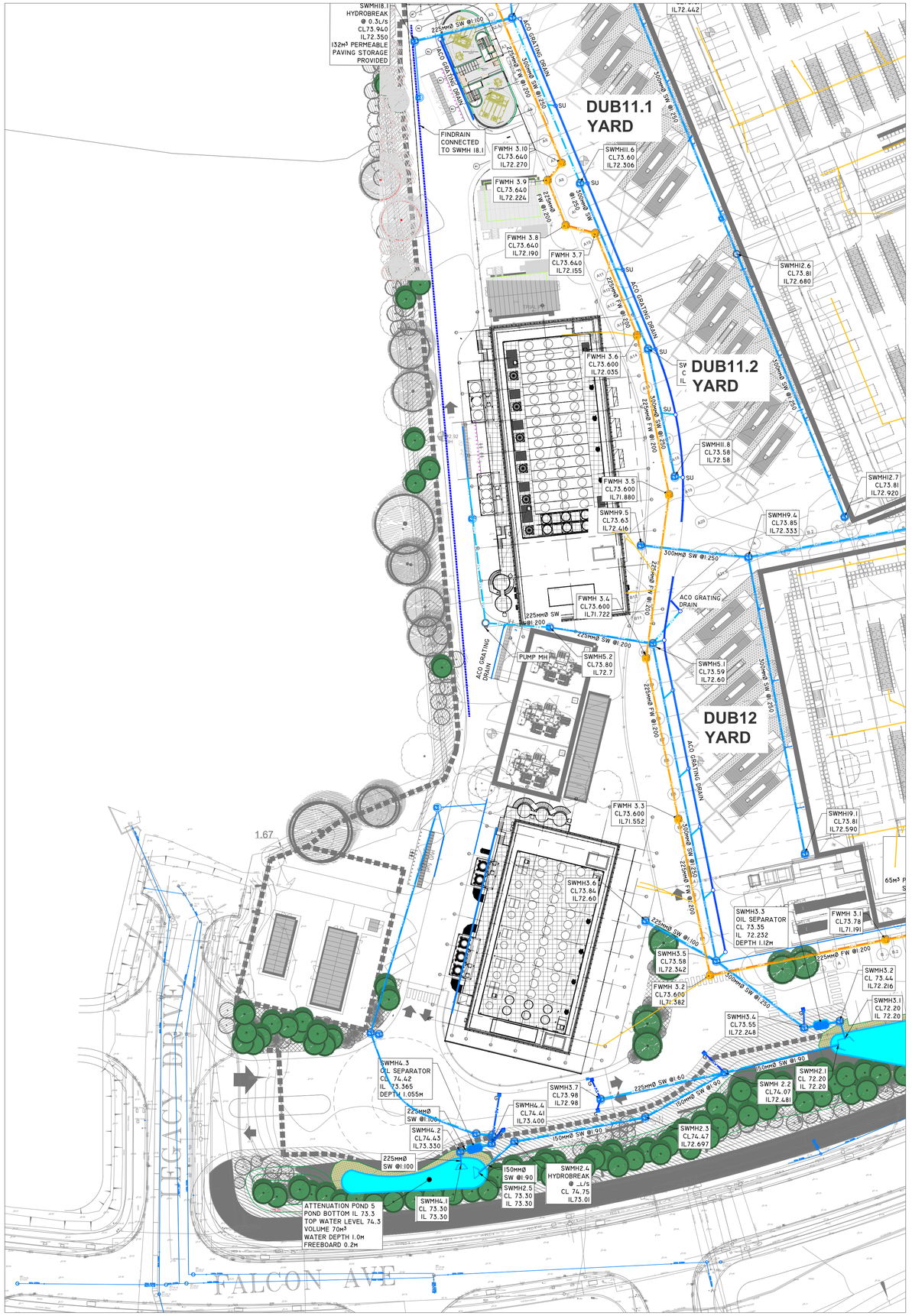


Design originator:

BURNS McDONNELL

10 Bishops Square, London E1 6AO, United Kingdom

www.burnsmcd.com/locations/London

www.burnsmcd.com/services

## LEGEND

- PROPOSED PRIVATE SURFACE WATER SEWER
- PROPOSED PRIVATE FOUL SEWER
- EXISTING PRIVATE FOUL WATER SEWER
- EXISTING PRIVATE SURFACE WATER SEWER
- EXISTING PUBLIC FOUL SEWER
- EXISTING PUBLIC SURFACE WATER SEWER
- MANHOLE BACKDROP (BDI)
- DRAINAGE CHANNEL
- DRAINAGE RUN TO BE ABANDONED
- INTERNAL FOUL GULLY PIPE (TX)
- ROAD GULLY (G)
- RODDING EYE (RE)
- SW DISTRIBUTION BOX (SWDB)
- SILT TRAP (ST)
- 150Ø SURFACE WATER SEWER
- SUMP UNIT WITH RODDABLE AIR TRAP (SU)
- SOIL VENT PIPE (SVP)
- STUB STACK (SS)
- AIR ADMITTANCE VALVE (AAV)
- FOUL INTERCEPTOR TRAP (FIT)
- RAINWATER DOWNPIPE (RWP)
- SIPHONIC RAINWATER DOWNPIPE (SRWP)
- PROPOSED LEVEL 69.200
- EXISTING TIE IN LEVEL 69.200
- EXISTING LEVEL + 67.72
- SITE BOUNDARY
- ATTENUATION POND

DRAINAGE NOTES:

1. ALL FOUL SEWERS, MANHOLES AND CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE AND IRISH WATER WASTEWATER INFRASTRUCTURE STANDARD DETAILS.
2. ALL FOUL SEWER HOUSE CONNECTIONS TO BE MIN 100mmØ UPVC TO IS EN 1401 2009/2012, STIFFNESS CLASS 8KN/M2 IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
3. ALL PUBLIC FOUL SEWERS TO BE MINIMUM 225mm DIAMETER THERMOPLASTIC STRUCTURED WALL PIPES TO IS EN 13746 (2007/2009), TYPE SN8 AND WIS 4-35-01 (2008) AND COMPLY WITH THE REQUIREMENTS OF THE IRISH WATER CODE OF PRACTICE.
4. ALL PUBLIC SURFACE WATER SEWERS TO BE MINIMUM 225 DIA. CLASS H CONCRETE TO EN1916 & IS 6 2004 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
5. ALL SURFACE WATER CONNECTIONS TO BE MINIMUM 150mmØ UPVC TO IS EN 1401 2009/2012 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
6. LOCATION AND INVERT LEVELS OF EXISTING MANHOLES OR OUTFALL POINTS, WHERE APPLICABLE TO BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF DRAINAGE WORKS.
7. ALL FOUL CONNECTIONS TO COMPLY WITH THE REQUIREMENTS OF IRISH WATER.
8. ALL FOUL SEWERS TO BE AIR TESTED IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
9. ALL COVER LEVELS TO MATCH FINISHED ROAD/VERGE/FOOTPATH/CYCLETRACK LEVELS UNLESS OTHERWISE STATED.
10. CONTRACTOR TO INCLUDE FOR CCTV SURVEY OF ALL SEWERS UPON COMPLETION OF SAME.

NOTE:

1. REFER TO DRAWING DUB11.1-DR-XX-C504-V2-WS4-PIN & DUB11.1-DR-XX-C509-V2-WS4-PIN FOR FOUL AND SURFACE WATER DETAILS

TO BE READ IN CONJUNCTION WITH DUB11.1-DR-UG-C127 & 127-V2-WS4-PIN

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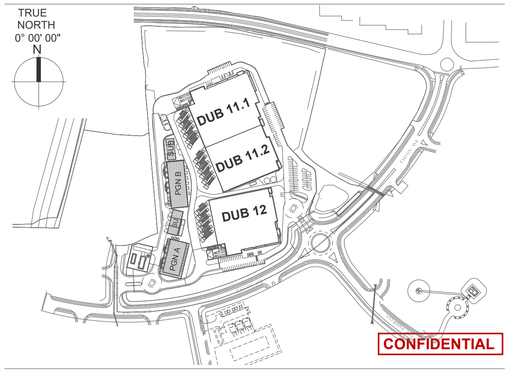


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Architect: Hyphen
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|---|---|---|---|
| | JM | S'OR | AMB |

Project address:

Profile Park, Dublin 22, Ireland
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Drawing title:

MFPG PROPOSED DRAINAGE LAYOUT

Sheet number: **C128**

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Scale For Microfilming
Millimeters
Inches


**Figure 4: Exploratory Hole Location Plan**

# APPENDIX 2

# ENVIRONMENTAL RISK ASSESSMENT

## Accidents

| Source-Pathway-Receptor Hypothetical Model | | | Risk Management Techniques | Assessing the Risk | | |
|---|---|---|---|---|---|---|
| **Source of Pollution** | **Receptor** | **Pathway** | | **Likelihood of Exposure** | **Consequence of Exposure** | **Overall Risk** |
| *Accident:* Failure in containment of diesel storage tank and associated equipment (valves, pipes etc.). | *Ground*<br>*Groundwater*<br>*Surface Water* | Over Installation surfaces; and, through Installation drainage systems. | All fuel pumps and pipework are located within engine containers, providing sealed containment (bunding).<br>All storage tanks are provided with secondary containment providing 110% of the capacity of the primary storage container.<br>Containers are located on a concrete hardstanding.<br>Drainage for the concrete hardstanding is served by an interceptor and a shut-off valve to provide tertiary containment in the event of a spillage.<br>Diesel storage tanks are fitted with high level alarms, overfill protection devices and bund alarms, which are linked into the building management system. | Very Low | High | **Low** |

| | | | | | | |
|---|---|---|---|---|---|---|
| *Accident:* Spillage during refuelling / fuel polishing (e.g. pipe rupture, tanker rupture, connection fault etc.) | *Ground*<br><br>*Groundwater*<br><br>*Surface Water* | Over Installation surfaces; and, through Installation drainage systems. | All deliveries of fuel are attended to identify any issues during delivery.<br><br>All deliveries of fuel take place in areas of the installation, which are covered by concrete.<br><br>Surface water drainage in delivery areas discharges via oil interceptors, which will be maintained on a regular basis.<br><br>Drainage for the delivery areas has emergency shut off valves installed to provide secondary containment in the event of a spillage. These valves will be activated prior to routine filling operations as a precautionary measure.<br><br>Spill kits (including drain covers) are provided in refuelling areas.<br><br>The Operator will establish formal refuelling and spill response procedures as part of the environmental management system. | Very Low | Medium | **Low** |

| | | | | | | |
|---|---|---|---|---|---|---|
| *Accident:* Flooding potential to impact drainage system and generators. | *Surface Water* | Through flood water, over surfaces & through Installation drainage systems discharging to ground via soakaway. | Metal and concrete construction of the tanks, connective pipework and containment infrastructure, so that there is minimal risk of water damage leading to spillage in a single flooding event.<br>The Facility is not located in an area of elevated flood risk, so probability of a flood occurrence is very low. | Very Low | High | **Low** |
| *Accidents (Fire):* Fire and arson attacks | *Humans including: workers/ visitors present at the Installation; workers / occupants / visitors on adjacent premises; local residents; intermittent presence on* | Over Installation surfaces; through the air; and, through Installation drainage systems. | A perimeter fence is present along the site boundary and all access points are secured with gates, which will only open for authorised personnel.<br>CCTV is present covering all external areas of the Installation. | Very Low | High | **Low** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | *pedestrian routes / roadways surrounding the Installation.*<br><br>*Ground*<br><br>*Groundwater*<br><br>*Surface water* | | A Security team is present at the site on a permanent basis. Regular site surveillance walks are undertaken by the security team.<br>The generator containers and fill points are kept locked.<br>The generator sets are set away from the perimeter fencing.<br>All generator sets have fire detection systems present within the generator containers, which when triggered activate fuel cut of valves.<br>Penstock valves on surface water discharge points activate when the fire alarm is activated to seal drains & retain firewater (if any). | | | |
| *Accidents (Vandalism):* Damage / theft of externally located equipment / tanks | *Surface Water*<br>*Atmosphere*<br>*Ground*<br>*Groundwater* | Over Installation surfaces; through the air; and, through Installation drainage systems. | CCTV covers the site, which is secured by fencing and turnstile type gates with authorised access only.<br>The site is operational 24-hours a day, with security personnel on-site at all times | Very Low | Medium | **Low** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | monitoring CCTV and patrolling the site and specifically perimeter, which prevent security breaches. | | | |

# APPENDIX 3

## GROUND INVESTIGATION AND GEOTECHNICAL REPORT

Intended for
**Vantage Data Centers**

Document type
**Report**

Date
**September, 2021**

# VANTAGE, DUBLIN
# GROUND INVESTIGATION REPORT

RAMBOLL Bright ideas. Sustainable change.

# VANTAGE, DUBLIN
# GROUND INVESTIGATION REPORT

| | |
|---|---|
| Project name | **Vantage DUB EIA** |
| Project no. | **RUK2021N00147** |
| Recipient | **Vantage Data Centers** |
| Document type | **Report** |
| Document no. | |
| Version | **1.0** |
| Date | **15/09/2021** |
| Prepared by | **---** |
| Checked by | **JAMESF** |
| Approved by | **JAMESF** |
| Description | **Ground Investigation** |


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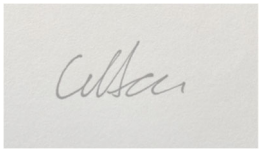
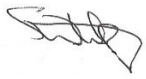
|  |  |  |
| **George Hughes** | **Steve White** | **James Flack** |
| Graduate Engineer | Principal Engineer | Director |

| Revision | Date | Prepared by | Checked by | Approved by | Description |
|---|---|---|---|---|---|
| 1.0 | 15/09/2021 | GH | SPW | JAF | |

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## APPENDICES

# 1. INTRODUCTION

Ramboll UK Limited (Ramboll) has been appointed by Vantage Data Centers (The Client) to develop a geotechnical and geo-environmental assessment with regards to the proposed development of two two-storey data centre buildings, a single-story gas-powered generation plant and an associated car park.

This report is a Geotechnical Ground Investigation Report, as defined by "Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing". This report details the adopted ground models and defines the recommended characteristic geotechnical material parameters based on the findings of the 2021 IGSL Ltd Ground Investigation & Geotechnical Report, in accordance with the principles of Part 2 of EN 14688, "Geotechnical investigation and testing – Identification and classification of soil".

To develop this report, Ramboll used information from the 2021 IGSL Ltd Ground Investigation Factual Report. The purpose of the investigation was to gain information on the ground conditions, including groundwater data and potential ground and ground contamination.

This report also provides geotechnical recommendations in relation to the proposed development, based on the findings from the Ground Investigation Factual Report. It does not cover interpretation or recommendation with respect to ground and groundwater contaminations for which the reader should refer to Volume 1: Main Environmental Impact Assessment Report, Chapter 12: Ground Conditions.

## 1.1 Development Proposals

At the time of writing the proposed redevelopment scheme consisted of demolition of an existing single storey dwelling and outbuilding followed by the construction of two no. 2 storey data centres (see Figure 1) with a gross floor area of approximately 40,589 sqm (including floor area of approximately 1,354 sqm for office space across both data centres).


**Figure 1: Development Proposal Drawing**

The northern data centre (Building 12) includes a two-storey building of 12,915 sqm and comprise 11 no. standby emergency generators with associated flues, each of which are 22.3 metres in height and are to be located towards the west of the building.

The southern data centre (Building 11) comprises of a two-storey building with a total floor area of 24,667 sqm, with 22 no. standby emergency generators and associated flues, each of which are 22.3 metres in height. The flues are to be located towards the west of the building.

Both data centres will be approximately 14.23 metres to parapet height, with the roof plant increasing the total height to 18.5 metres.

The development will also include the construction of an internal road network and 144 car parking spaces, of which 8 no. will consist of disabled parking spaces and 14 no. will be for electric vehicles. A covered bicycle parking area will be provided on the site. At the time of writing it is not known whether the car parking will all be at ground level or comprise a multi-storey structure.

In addition to the data centres and car park, a 13 metre high single storey gas powered generation plant will be constructed towards the west of the larger data centre. The gross floor area of the plant will be approximately 2,714 sqm and contain 10 no. gas generators with associated flues, of which are each 25 metres in height. The gas generation plant will be located to the west of Building 11.

## 1.2 Scope and Objectives

The scope of this report includes the determination of geotechnical aspects for use in the development of the proposed works. The report is issued based on the information extracted from the 2021 IGSL Ltd Ground Investigation Factual Report (report ref: 23300 Rev 1).

The following objectives will serve to satisfy the scope of the report:

- Project Information;
- Geographic location and geology;
- Summary of the ground investigation;
- Summary of the factual report findings and ground and groundwater conditions encountered at the site;
- Summary of sub surface conditions and characteristic geotechnical parameters;
- Outline Foundation Recommendations;
- Recommendations on parameters for evaluation of retaining wall design;
- Outline advice on excavation and filling including any possible reuse of material;
- Outline CBR values based on laboratory testing for pavement design;
- Geotechnical parameters which can be used in slope stability assessment; and
- Ground aggressivity towards buried concrete.

## 1.3 Limitations and Constraints

This report has been prepared solely for Vantage Data Centers and shall not be relied upon by any third party unless that party has been granted a contractual right to rely on this report for the purpose for which it was prepared.

Ramboll has endeavoured to assess all information provided to them but makes no guarantees or warranties for the completeness or accuracy of information relied upon derived from third party sources.

The geotechnical risk register presented in Section 9 of this report captures risks relating to the proposed development at the time of writing this report. Any significant changes to the proposed design may require a re-assessment of the risks identified.

The ground investigation was carried out by IGSL Ltd utilising various ground investigation techniques.

It should be noted that as the ground conditions encountered during the ground investigation are only a known detail at each exploratory hole location, the ground conditions detailed on sections between holes have been interpolated and therefore the actual nature of the ground may differ from the interpretation provided by Ramboll. In addition, groundwater levels will vary seasonally and with changes in weather and climate or possibly due to leakage from faulty water infrastructure.

# 2. SITE DESCRIPTION

The site is located at a greenfield site in Grange Castle, Dublin, Republic of Ireland, approximately 100 metres south of the PRL Warehouse and adjacent to the New Nangor Road (R134) and Profile Park, shown in Figure 2. The development area is approximately 8.70 hectares (ha) and has an Easting and Northing of 703650 & 730806 (Irish Transverse Mercator). At of the time of writing the land is owned by Vantage Data Centers and a single dwelling with an outbuilding is located on the site, towards the north west corner. The dwelling is a single storey structure with a footprint of approximately 290 sqm.

The site is surrounded by a large industrial estate to the north, with the Grange Castle Motor Company directly to the west. The Grange Castle Golf Course is located adjacent to the east. An electrical substation is located approximately 150 metres away from the centre of the site, towards the west. The ground surface of the site is predominantly covered in grass with a few tress, bushes, and shrubs. The general topography of the site is flat. There are no slopes or retaining structures located on the site.


**Figure 2: Site Location**

# 3. GEOLOGY AND GROUND CONDITIONS

The online British Geological Survey Maps Portal shows the Geological Survey of Ireland 1:63,630 geological map drift series for Dublin, 1902. The sheet indicates that the vast majority of Dublin is covered by Boulder Clay (Glacial Till), with River Terrace and Alluvial Deposits present along historical and exiting river channels. The sands and gravels that overly the Boulder Clay are steeply dipping in some areas.

Towards the south west of Dublin, there is evidence of a large Esker, consisting of sands and gravels. Similar deposits are located further northwards.

From the 1902 map sheet, the bedrock consists of the Upper, Middle and Lower Dolomitised Limestone of the Carboniferous. Localised outcrops are exposed in pockets surrounding the city. Towards the south are areas with large intrusive Granite Plutons, that have since been exposed due to weathering and erosion of the drift deposits.

Data from the online Geological Survey of Ireland Interactive Map, indicates that the site is underlain by The Lucan Formation, which forms part the of the Carboniferous Limestone. The formation comprises a dark grey to black, fine-grained, occasionally cherty micritic limestone that weathers to a pale grey colour. The formation has a thickness ranging between 300 metres to 800 metres. The drift deposits at the site are envisaged to consist of Glacial Till derived from Limestone.

As set out in Main Environmental Statement Chapter 12: Ground Conditions, there are three main bedrock aquifer classifications in Ireland (regionally important, locally important, and poor aquifers). The Geological Survey of Ireland Interactive Map indicates that the site area is host to a locally important aquifer, of which is moderately productive only in local zones.

## 3.1 Historical Ground Investigation Data

No historical ground investigation data for the site is available.

## 3.2 Historical Data Summary

N/A.

## 3.3 Previously Recorded Geology

N/A.

## 3.4 Mining and Quarrying

According to the Geological Survey of Ireland there are no active quarries located in the immediate vicinity of the site with the nearest quarry being located approximately 4 km south east at Belgrad Quarry. EPA mapping indicates there are no mines on or near to the site.

# 4. GROUND INVESTIGATION

A ground investigation was undertaken by IGSL Ltd for the purpose of investigating and reporting on the ground and groundwater conditions at the site to assist with identifying geotechnical and geo-environmental risks and hazards. The factual report was completed in July 2021.

The ground investigation works were undertaken in accordance with:

- EN 1997-2 Eurocode 7: 2007 – Geotechnical Design – Part 2: Ground Investigation & Testing;
- EN ISO 22475-1:2006 Geotechnical Investigation and Sampling – Sampling Methods & Groundwater Measurements;
- EN ISO 14688-1:2002 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 1: Identification and Description;
- EN ISO 14688-2:2204 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 2: Classification Principles;
- EN ISO 14689-1:2004 Geotechnical Investigation and Testing – Identification & Classification of Rock, Part 1: Identification & Description;
- Engineers Ireland Specification for Ground Investigation, 2nd Edition, 2016;
- BS 5930:2015 Code of Practice for Ground Investigation; and
- BS 1377:1990, Parts 1 to 9.

The IGSL Ltd factual report (ref:23300) is presented in Appendix B and includes all the exploratory hole logs, the exploratory hole plan and lab testing results. The exploratory hole location plan is presented as Figure 1 in Appendix A.

The geotechnical element of the investigation was designed to provide site-specific information on:

- The presence, thickness, and composition of any recent and superficial deposits beneath the proposed development areas;
- Depth to and information on the solid geology to allow characterisation of the bedrock;
- The strength and stiffness of the underlying soils and bedrock;
- Chemical composition of soils for buried concrete design; and
- Determination of the existing groundwater levels.

The scope of ground investigation works undertaken at the site involved the following:

- 13 no. trial pits to a maximum depth of 2.60 metres below ground level (mbgl);
- 17 no. cable percussive boreholes to a maximum depth of 2.90 mbgl;
- 3 no. rotary cored drillholes to a maximum depth of 10.00 mbgl;
- 13 no. plate load tests carried out at depths of 0.4 mbgl to 0.6 mbgl to determine in situ California Bearing Ratio;
- 3 no. infiltration tests in accordance with BRE Digest 365 'Soakaway Design';
- Geophysical survey (in situ resistivity);
- Groundwater monitoring of 3 no. installations; and
- Surveying of exploratory hole locations.

Groundwater standpipes were installed in all three rotary holes with groundwater levels monitored across the site post installation.

In-situ testing comprising standard penetration tests were performed in the boreholes to derive N values. The N values presented in the exploratory logs are uncorrected for energy ratio.

The following geotechnical laboratory tests were carried out on select samples obtained from the site.

- Particle Size Distribution;
- Plasticity Index;
- Moisture Condition Value;
- California Bearing Ratio;
- Proctor Compaction; and
- Point Load Strength Index.

# 5. GEOTECHNICAL FINDINGS

The ground conditions encountered during the 2021 IGSL Ltd investigation typically consisted of topsoil which is underlain by Glacial Deposits and the Undifferentiated Dublin Calp Limestone. No Made Ground was encountered during the investigation and is considered to be due to the site's past and recent use for growing crops. The thickness of the topsoil ranged from 0.3 mbgl to 0.5 mbgl.

Underlying the topsoil, a fine grained probable superficial soil, comprising firm to stiff orange brown, mottled orange brown, brown, grey, grey brown, yellow brown, sandy, gravelly silt with low cobble content was recorded. The PSD gradings generally recorded the material composition to comprise over 50% of the constituents being silt sized particles.

Underlying the superficial layer a heavily overconsolidated ablation till, often referred to as 'Dublin Boulder Clay' was present. The Glacial Till was described as either dark grey/ black, grey mottled orange-brown, grey and light grey that increases with stiffness and gravel (cobble sized clasts) content. The clasts ranged from subrounded to subangular and were dominated by limestone fragments that had originated from the parent bedrock.

The Undifferentiated Dublin Calp Limestone, which is mainly the Dublin Basin Sequence was found to underly the Glacial Till at the site. The formation was described as being strong, dark grey to black, fine-grained to predominantly argillaceous or muddy limestone with partings or thin interbedded layers of shale or mudstone. Rockhead was proved at depths ranging from 2.60 mbgl to 3.00 mbgl.

**Table 5-1: Summary of ground conditions encountered**

| Strata | Description | Depth to Base (mbgl) | Average Thickness (where encountered) (m) |
|---|---|---|---|
| TOPSOIL | Soft brown sandy silt with rootlets. | 0.15 to 0.30 | 0.25 |
| Possible Superficial Deposits | Firm to stiff orange-brown, mottled orange brown, brown, grey, grey brown, yellow brown sandy gravelly SILT/ CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse, limestone. Cobbles are subangular to subrounded, limestone. | 0.50 to 2.20 | 0.80 |
| Glacial Till | Very stiff grey slightly sandy gravelly CLAY/ SILT with low cobble content. Gravel is subangular to subrounded fine to coarse, limestone. Cobbles are subangular to subrounded, limestone. | 1.10 to 2.90 | 1.10 |
| Weathered Rockhead (Limestone) | Medium strong grey shaley LIMESTONE. Recovered as angular cobbles with occasional tabular cobbles and boulder (<0.3 m) in matrix of silty gravel. | 3.00 | 0.35 |
| Bedrock (Limestone) | Strong to locally very strong, medium to thinly bedded, light to dark grey/ black, fine-grained, LIMESTONE (predominantly muddy with local subordinate sandy limestone layers, local stylolites, local pyrite crystallisation), fresh to very locally slightly weathered. | >10.00 | Not Proven |

## 5.1 Topsoil

*Classification Description*

Topsoil was encountered in all trial pits and cable percussive boreholes, except for the rotary drillholes. The average thickness of the topsoil across the site was found to be approximately

0.25 metres, with the maximum thickness found to be 0.5 metres. No in situ or geotechnical testing was performed on the topsoil as it will be stripped prior to construction.

## 5.2 Possible Superficial Deposits

*Classification Description*

Underlying the Topsoil, a layer of possible superficial deposits was encountered site wide from depths ranging between 0.50 mbgl and 2.20 mbgl. The base of the stratum was proven in all the trial pits, excluding TP10 & TP12 which were located towards the southern part of the site. The average thickness of the deposit was 0.8 metres with a minimum thickness of 0.20 metres and a maximum of 2.05 metres recorded. Generally, the stratum was less than 1.0 metre thick.

Based on the findings of the 2021 IGSL investigation, the deposits have been recorded as being a firm grey-brown mottled orange-brown sandy gravelly silt/clay, considered to have been deposited in a glacial environment. Typically, the gravel was subangular to subrounded, fine to coarse, limestone (of probable Dublin Calp Limestone origin).

*In situ Testing*

A total of eleven standard penetration tests were performed within the weathered glacial till at depths ranging from 1.0 mbgl to 2.0 mbgl. The N values recorded uncorrected values ranging from 12 to 49 with an average value of 20. The corrected $N_{60}$ values of between 15 to 63 indicate to the soils being stiff to very stiff, whereas the engineering descriptions record the deposit predominantly as of firm consistency. Gradings from the PSDs record the gravel content to range from 13% to 17% (see Table 5.4). The gravel content can influence the SPT resulting in an elevated N value, therefore for this deposit the engineering description consistency is considered representative of the soil mass.

Nine plate load tests were carried out within the superficial soils. The depths at which the tests were conducted ranged from 0.4 mbgl to 0.6 mbgl, with equivalent CBR values ranging from 1.30% to 9.40% and modulus of subgrade reaction values ranging from 17 MPa/m to 53 MPa/m.

The in situ test results are summarised in Table 5-2.

**Table 5-2: Summary of in situ test results - Possible Superficial Deposits**

| Test | Possible Superficial Deposits | |
|---|---|---|
| | **Range of Results** | **Mean** |
| SPT | 12 to 49 | 20 |
| Plate Load (CBR %) | 1.3 to 3.4 | 2.4 |
| Plate Load (Modulus of Subgrade Reaction) (MPa/m) | 17 to 29 | 23 |

*Geotechnical Laboratory Testing*

Various geotechnical laboratory tests were carried out on select samples which included moisture content, California Bearing Ratio and Atterberg limit tests. No unconsolidated undrained triaxial strength tests were carried out on the Possible Superficial Deposits. This is possibly due to the high content of coarse-grained material within the mass of the Possible Superficial Deposits.

In addition to the geotechnical tests, chemical tests were performed to determine the aggressive nature of the soils in relation to buried concrete design.

The geotechnical test results are summarised in Table 5-3.

**Table 5-3: Summary of geotechnical test results - Possible Superficial Deposits**

| Test | Possible Superficial Deposits | |
|---|---|---|
| | Range of Results | Mean |
| Moisture Content (%) | 14 to 27 | 17 |
| Plasticity Index (%) | 15 to 20 | 18 |
| Liquid Limit (%) | 32 to 42 | 37 |
| Plastic Limit (%) | 17 to 22 | 20 |
| CBR (%) Natural Moisture Content | 2 to 23 | 12.5 |
| Bulk Density (Mg/m³) | 1.93 to 2.16 | 2.05 |
| Dry Density (Mg/m³) | 1.51 to 1.88 | 1.70 |
| Water Soluble Sulphate $SO_4$ (g/l) | <0.010 | <0.010 |
| Total Sulphur | <0.010 to 0.024 | <0.018 |
| pH | 8.5 to 9.4 | 8.9 |

In addition to CBRs being carried out at natural moisture content, further tests were also performed with the addition of either lime or lime and cement to the soil samples. Modified soil samples were prepared with 1%, 2% and 3% lime and a final test with 1% lime and 2% cement, then cured for either 3, 7 or 14 days. Once cured the samples were subjected to CBR tests the results of which are recorded in Table 5. to Table 5-6: CBR test results Possible Superficial Deposits - 14 days.

**Table 5-4: CBR test results Possible Superficial Deposits - 3 days with lime and cement added**

| BH No. | Depth (mbgl) | CBR (%) 1% Lime | CBR (%) 2% Lime | CBR (%) 3% Lime | CBR (%) 1% Lime & 2% Cement |
|---|---|---|---|---|---|
| TP1 | 0.5 | 44 | 35 | 38 | 49 |
| TP6 | 0.6 | 7 | 13 | 19 | 28 |

**Table 5-5: CBR test results Possible Superficial Deposits - 7 days**

| BH No. | Depth (mbgl) | CBR (%) 1% Lime | CBR (%) 2% Lime | CBR (%) 3% Lime | CBR (%) 1% Lime & 2% Cement |
|---|---|---|---|---|---|
| TP1 | 0.5 | 42 | 39 | 45 | 57 |
| TP6 | 0.6 | 10 | 18 | 24 | 34 |

**Table 5-6: CBR test results Possible Superficial Deposits - 14 days**

| BH No. | Depth (mbgl) | CBR (%) 1% Lime | CBR (%) 2% Lime | CBR (%) 3% Lime | CBR (%) 1% Lime & 2% Cement |
|---|---|---|---|---|---|
| TP1 | 0.5 | 38 | 41 | 51 | 60 |
| TP6 | 0.6 | 12 | 26 | 29 | 40 |

## 5.3 Glacial Till

*Classification Description*

Underlying the possible superficial soils Glacial Till was encountered. The Glacial Till was encountered sitewide at depths ranging from 1.10 mbgl to 2.90 mbgl, with an average recorded thickness of 1.10 metres. The base of the stratum was proven in all 13 trial pits excavated across the site.

The stratum was recorded as being a very stiff grey slightly sandy gravelly clay/silt with low limestone cobble content. Gravel was subangular to subrounded fine to coarse limestone.

*In-situ Testing*

A total of twenty-two standard penetration tests were performed within the glacial till deposit, at depths ranging from 1.00 mbgl to 2.90 mbgl. The uncorrected N values ranged from 17 to 56, although for the purposes of deriving geotechnical parameters, all N values have been limited to a maximum of 50 (i.e. refusal). The average uncorrected N value for the Glacial Till was recorded as 41. The corrected $N_{60}$ value of between 21 to >50 equates to a very high strength material and correlates with the engineering descriptions.

The in situ test results are presented in Table 5-7.

**Table 5-7: Summary of in situ test results - Glacial Till**

| Test | Glacial Till | |
|---|---|---|
| | Range of Results | Mean |
| SPT | 17 to 56 | 41 |
| Plate Load (CBR %) | 1.6 to 5.3 | 3.5 |
| Plate Load (Modulus of Subgrade Reaction) (MPa/m) | 19 to 38 | 29 |

*Geotechnical Laboratory Testing*

Various geotechnical laboratory tests were carried out on select samples originating from the weathered glacial till. The tests included moisture content, particle size distribution, California Bearing Ratio, Atterberg limit tests and MCV tests. No unconsolidated undrained triaxial tests were carried out on the glacial till.

In addition to the geotechnical tests, chemical tests were performed to determine the aggressivity of the ground towards buried concrete.

Results of the gradings are presented in Table 5.9, whilst a summary of the other geotechnical and geo-chemical test results are presented in Table 5.10.

**Table 5-8: Summary of Particle Size Distribution test results - Glacial Till**

| Exploratory Hole | Depth (mbgl) | Cobbles (%) | Gravel (%) | Sand (%) | Silt (%) | Clay (%) |
|---|---|---|---|---|---|---|
| TP01 | 0.5 | 0 | 17 | 18 | 48 | 17 |
| TP02 | 1 | 0 | 54 | 12 | 24 | 10 |
| TP03 | 1 | 0 | 25 | 24 | 39 | 12 |
| TP03 | 2 | 17 | 39 | 15 | 17 | 12 |
| TP05 | 1 | 0 | 24 | 8 | 51 | 17 |
| TP06 | 0.6 | 0 | 13 | 13 | 54 | 20 |

| Exploratory Hole | Depth (mbgl) | Cobbles (%) | Gravel (%) | Sand (%) | Silt (%) | Clay (%) |
|---|---|---|---|---|---|---|
| TP07 | 1 | 0 | 36 | 17 | 33 | 14 |
| TP09 | 0.6 | 0 | 17 | 15 | 51 | 17 |
| TP10 | 0.5 | 46 | 30 | 4 | 20 | 0 |
| TP11 | 1 | 0 | 24 | 4 | 49 | 23 |
| TP12 | 0.5 | 0 | 11 | 13 | 57 | 19 |
| TP13 | 1 | 7 | 43 | 10 | 27 | 13 |

The geotechnical lab results are presented in Table 5-9.

**Table 5-9: Summary of geotechnical test results - Glacial Till**

| Test | Glacial Till | |
|---|---|---|
| | Range of Results | Mean |
| Moisture Content (%) | 9 to 22 | 15 |
| Plasticity Index (%) | 10 to 21 | 16 |
| Liquid Limit (%) | 27 to 43 | 35 |
| Plastic Limit (%) | 15 to 23 | 19 |
| CBR (%) Natural Moisture Content | 9 | 9 |
| MCV (Natural Moisture Content) | 10.3 to 14.2 | 12 |
| Bulk Density (Mg/m3) | 2.14 | 2.14 |
| Dry Density (Mg/m3) | 1.82 | 1.82 |
| Water Soluble Sulphate SO4 (g/l) | <0.010 | <0.010 |
| Total Sulphur | <0.010 | <0.010 |
| pH | 8.5 to 9.6 | 9 |

CBR tests were performed on samples of the glacial till modified with various percentages of lime and cement and then cured for either 3, 7 or 14 days prior to testing. The results of the modified CBR tests are presented in Table 5-10 to Table 5-12.

**Table 5-10: CBR test results Glacial Till - 3 days**

| BH No. | Depth (mbgl) | CBR (%) 1% Lime | CBR (%) 2% Lime | CBR (%) 3% Lime | CBR (%) 1% Lime & 2% Cement |
|---|---|---|---|---|---|
| TP12 | 0.5 | 11 | 15 | 29 | 41 |

**Table 5-11: CBR test results Glacial Till – 7 days**

| BH No. | Depth (mbgl) | CBR (%) 1% Lime | CBR (%) 2% Lime | CBR (%) 3% Lime | CBR (%) 1% Lime & 2% Cement |
|---|---|---|---|---|---|
| TP12 | 0.5 | 15 | 20 | 36 | 42 |

**Table 5-12: CBR test results Glacial Till - 14 days**

| BH No. | Depth (mbgl) | CBR (%) 1% Lime | CBR (%) 2% Lime | CBR (%) 3% Lime | CBR (%) 1% Lime & 2% Cement |
|---|---|---|---|---|---|
| TP12 | 0.5 | 20 | 20 | 40 | 65 |

MCV tests were performed on Glacial Till samples obtained from the trial pits. The MCV tests were carried out on samples at their received natural moisture content and then followed by mixing the samples with various quantities of lime (calcium oxide). The test results are summarised in Table 8-4.

## 5.4 Dublin Calp Limestone

*Classification Description*

Underlying the Glacial Till a weathered layer of the Dublin Calp Limestone bedrock was encountered. The deposit was encountered site wide, in Trial pits TP1, TP10, TP11, TP12, TP13, TP4, TP5 and TP9. There were no records of the deposit being encountered within the cable percussion boreholes as the drilling technique failed to recover any intact samples. The rotary drillholes RC01, RC02 and RC03 recorded a layer from approximately 2.60 mbgl to 3.0 mbgl as 'returns of rock' and this has been interpreted as being part of the weathered rockhead.

The 2021 IGSL report described the weathered rockhead as a medium strong grey shaley limestone recovered as angular cobbles with occasional tabular cobbles and boulder (<0.3 metres) in matrix of silty gravel. The depth to base of the weathered rockhead was proven within the rotary drillholes at a depth of 3.00 mbgl and an average thickness of 0.35 metres. The depth to the top of the weathered rockhead was variable across the site, with a maximum difference of 1.60 metres between depths.

Underlying the weathered rockhead was the Dublin Calp Limestone, otherwise referred to, in this report as the bedrock. Three rotary drillholes (RC01, RC02 and RC03) proved the bedrock to a maximum depth of 10.00 mbgl prior to termination of the drillhole.

The IGSL report describes the bedrock as being a strong locally very strong, medium to thinly bedded, light to dark grey/ black, fine-grained limestone. Predominantly muddy with local subordinate sandy limestone layers, local stylolites, local pyrite crystallisation, fresh to very locally slightly weathered.

*In situ Testing*

In situ testing was not carried out within the bedrock.

*Geotechnical Laboratory Testing*

No geotechnical laboratory testing was performed on the weathered rockhead material.

Sub samples of bedrock were subject to point load strength tests (Table 5.14) and unconfined compressive strength (UCS) tests (Table 5.15) to derive the uniaxial compressive strength of the bedrock. A total of fifteen point load tests were undertaken at various depths with values ranging from 8.0 MPa to 104.0 MPa (based on a correlation of K value of 20). In addition to the point load tests, three UCS tests were performed on core samples taken from the rock. The cores were taken at depths ranging from 5.90 mbgl to 6.30 mbgl and produced UCS results ranging from 43.0 MPa to 90.0 MPa.

**Table 5-13: Point load test results - Bedrock**

| RC No. | Depth (mbgl) | Level (mOD) | Is (MPa) | Is(50) (MPa) | UCS (MPa) |
|---|---|---|---|---|---|
| RC01 | 3.10 | 72.50 | 2.96 | 3.61 | 72 |
| RC01 | 3.20 | 72.50 | 4.27 | 5.22 | 104 |
| RC01 | 4.50 | 72.50 | 1.81 | 2.21 | 44 |
| RC01 | 4.60 | 72.50 | 3.12 | 3.81 | 76 |
| RC01 | 6.70 | 72.50 | 3.62 | 4.42 | 88 |
| RC02 | 3.10 | 73.25 | 1.31 | 1.61 | 32 |
| RC02 | 3.20 | 73.25 | 0.82 | 1.00 | 20 |
| RC02 | 6.70 | 73.25 | 0.66 | 0.80 | 16 |
| RC02 | 7.70 | 73.25 | 0.33 | 0.40 | 8 |
| RC02 | 8.60 | 73.25 | 1.97 | 2.41 | 48 |
| RC03 | 3.30 | 73.51 | 0.33 | 0.40 | 8 |
| RC03 | 4.50 | 73.51 | 0.99 | 1.20 | 24 |
| RC03 | 7.50 | 73.51 | 0.33 | 0.40 | 8 |
| RC03 | 7.70 | 73.51 | 3.12 | 3.81 | 76 |
| RC03 | 8.80 | 73.51 | 1.31 | 1.61 | 32 |

**Table 5-14: Direct UCS test results - Bedrock**

| RC No. | Depth (mbgl) | Level (mOD) | Bulk Density ($Mg/m^3$) | UCS (MPa) | Stratum |
|---|---|---|---|---|---|
| RC01 | 6.30 | 72.50 | 2.64 | 43 | Bedrock |
| RC02 | 5.50 | 73.25 | 2.67 | 48.55 | Bedrock |
| RC03 | 5.90 | 73.51 | 2.61 | 90.83 | Bedrock |

# 6. GROUNDWATER

There is limited information on the presence and extent of groundwater at the site. Water strikes were recorded in each of the trial pits and some of the cable percussion boreholes as seepages at depths ranging from 1.2 mbgl to 1.9 mbgl. Boreholes BH01, BH07, BH08, BH10, BH12 and BH17 recorded the presence of groundwater at depths ranging from 1.6 mbgl to 2.4 mbgl. All remaining cable percussive boreholes described the holes as being dry during drilling. The IGSL report noted that casings within the dry boreholes could have potentially prevented any water ingress.

The rotary drillholes recorded groundwater strikes ranging from 2.50 mbgl to 3.00 mbgl during the drilling process and then rising to 1.70 mbgl to 2.10 mbgl by the end of drilling.

Standpipes were installed in all the rotary drillholes to allow groundwater levels to be monitored. Monitored levels were recorded as being between 0.97 mbgl to 1.89 mbgl on the 21/06/2021. The results are presented in Table 6-1.

**Table 6-1: Groundwater monitoring results**

| RC No. | Level (mOD) | Date of Reading | Depth of Reading (mbgl) | Level of Reading (mOD) |
|---|---|---|---|---|
| RC01 | 72.50 | 21/06/2021 | 0.97 | 71.53 |
| RC02 | 73.25 | 21/06/2021 | 1.54 | 71.71 |
| RC03 | 73.51 | 21/06/2021 | 1.89 | 71.76 |

Three soakaway tests were conducted to determine the infiltration rate of the upper soils. The tests recorded extremely low infiltration rates which is considered to be representative given the nature of the ground conditions i.e. presence of fine grained soils. The results of the tests are presented in Table 6-2.

**Table 6-2: Soakaway test results**

| Hole No. | Depth to Base of Pit (mbgl) | Infiltration Rate (metres/ minute) | Infiltration Rate (metres/ second) | Stratum |
|---|---|---|---|---|
| SA1 Cycle 1 | Test Failed | | | |
| SA1 Cycle 2 | 2 | 0.0000550 | 0.000000912520 | Glacial Till |
| SA2 Cycle 1 | Test Failed | | | |
| SA2 Cycle 2 | 2 | 0 | 0 | Glacial Till |
| SA3 Cycle 1 | 2 | 0 | 0 | Glacial Till |
| SA3 Cycle 2 | 2 | 0 | 0 | Glacial Till |

# 7. DERIVATION OF GEOTECHNICAL PARAMETERS

The data presented in this section is based upon the results of the 2021 IGSL investigation designed by Ramboll.

The characteristic values of geotechnical parameters and ground model recommendations provided have been selected for the purposes of permanent works design. If these parameters are to be adopted for any temporary works design the Temporary Works Designer should be satisfied that the parameter selected is appropriate for the load case being considered.

The derivation of characteristic values of geotechnical parameters is described for the soils that are expected to be encountered. Where direct measurement of parameters has not been carried out, established correlations with measured properties have been used to derive values for design. Material data plots are presented in Appendix A.

Characteristic values are defined as a cautious estimate of the value affecting the occurrence of a limit state based on Clause 2.4.5.2, from BS EN 1997-1: 2004 (Eurocode 7). Characteristic values should be used with appropriate partial factors or to achieve appropriate factors of safety, as required.

SPT N

The energy ratio of 76.91% has been used to produce corrected SPT $N_{60}$ values. Energy losses are induced by the SPT hammer assembly due to frictional and other parasitic effects, which cause the hammer velocity at impact to be less than the free fall velocity. Therefore, SPT results should be corrected to give values equivalent to some standard energy input. For general design purposes, the N values are adjusted to a reference energy ratio of 60%, by the following equation:

$N_{60} = (Er/60) \times N$

Where:

N is the blow count

Er is the energy ratio of the specific test equipment (provided by the specialist investigation contractor)

Corrections are applied following BS EN ISO 22476-3:2005+A1:2011 – Annex A (Geotechnical Investigation and Testing – Field testing. Part 3: Standard Penetration Test).

Weight Density

Adopted characteristic weight density values for the superficial deposits have been based on empirical values presented in Figure 1 and Figure 2 from BS 8002:2015.

Bedrock values have been derived from the laboratory tests performed as part of the 2021 IGSL Ltd Investigation.

Strength

*Cohesive Soils – Undrained Strength Parameters*

Characteristic undrained shear strength ($c_u$) for the over consolidated cohesive soils will be assessed from in situ testing and from material descriptions from boreholes, based on British Standard (BS) 5930:2015 and BS EN:1997 (2007).

For over consolidated cohesive soils, the characteristic undrained shear strength, $c_u$ can be derived from SPT N values (where available) using the correlation recommended by Stroud and Butler (1975):

$c_u = f_1 \times N_{60}$ (kN/m$^2$)

Where:

$N_{60}$ is the SPT N corrected for hammer energy;

$f_1$ is dependent on Plasticity Index as per Figure 3 reproduced by Tomlinson, 2001. Based on the data obtained during the 2021 investigation, an $f_1$ value of 5.2 has been adopted for the possible Superficial Deposits and also the Glacial Till in accordance with recommendations from CIRIA C504.

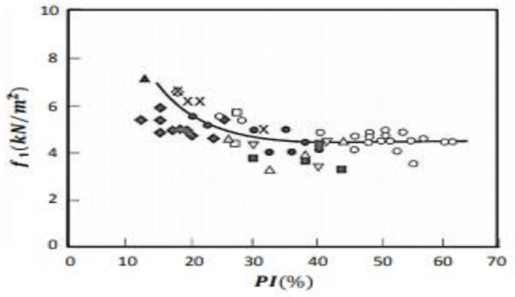



**Figure 3: Relationship between plasticity index and undrained shear strength of fine grained soils, reproduced from Tomlinson, 2001**

Based on the given method an undrained shear strength for the Possible Superficial Deposits was found to be between 80 kPa and 327 kPa with a mean of 135 kPa, whilst the Glacial Till produced values between 107 kPa and 353 kPa with a mean of 224 kPa.

The representative value of the undrained shear strength of both the possible Superficial Deposits and the Glacial Till will be determined by a conservative line drawn on the $C_u$ vs Depth plot, excluding any extreme values. Extreme values will be investigated as this may indicated a different soil type or other anomaly that may affect the design.

From the data plots the undrained shear strength of the Glacial Till increases with depth. It is recommended that the strength of the Glacial Till is limited to a maximum value of 300 kPa.

*Cohesive Soils - Effective Stress Strength Parameters*

Effective stress (drained) strength parameters for cohesive soils are determined from interpretation of the relationship between $\phi'$ and PI proposed by Kenney (1959). A conservative value of $\phi'$ will be derived based on an upper bound value of PI.

The characteristic angle of internal friction determined for the cohesive Superficial Deposits and Glacial Till based on plasticity index is 27°.

In the absence of effective stress strength tests undertaken on cohesive soils a drained cohesion (c') of 0 kN/m² has been recommended for design.

<u>Stiffness and Compressibility</u>

*Cohesive Soils*

Where determination of settlement of foundations on cohesive soils is required then stiffness will be assessed from SPT N values using the relationship described in CIRIA Report 143 (1995).

Stiffness based on Young's Modulus (E) has been assessed using:

For normally consolidated cohesive material (following Bowles):

- $E_u = c_u$ x 250 (kN/m²) for undrained stiffness

- $E'$ = $E_u$ x 0.6 (kN/m²) for drained stiffness

For overconsolidated cohesive material (following Bowles):

- $E_u$ = $c_u$ x 750 (kN/m²) for undrained stiffness
- $E'$ = $E_u$ x 0.6 (kN/m²) for drained stiffness

The settlements calculated from soil modulus values interpreted following the guidance in CIRIA Report 143 are likely to represent conservative settlements.

*Bedrock*

The Hoek-Brown Classification for the Intact Modulus of the weathered rockhead and bedrock has been derived using the software RocLab. The values were derived using the UCS, GSI, mi and MR. For the intact rock a UCS of 38MPa was adopted as the characteristic value based on the UCS and point load test data presented in the 2021 IGSL Ltd Report. In addition to the UCS value a mi value of 8 and an MR (modulus ratio) of 900 was used to derive the Intact Modulus.

## 7.1 Geotechnical Parameters

Table 7-1 provides a summary of the recommended characteristic values for the geotechnical soil parameters for the site.

**Table 7-1: Recommended characteristic values for the geotechnical soil parameters**

| Stratum | Geotechnical Parameters | | | | | |
|---|---|---|---|---|---|---|
| | Bulk Density (kN/m²) | Undrained Shear Strength (kN/m²) | Angle of Shearing Resistance (Φ´) | Young's Modulus (MPa) | | UCS (MN/m²) |
| | | | | $E_u$ | E′ | |
| Possible Superficial Deposits | 19 | 100 | 27 | 25 | 15 | - |
| Glacial Till | 19 | 125 | 27 | 93.75 | 56.25 | - |
| Weathered Dublin Calp Limestone | 26 | - | 24 | - | 31500 | 25 |
| Dublin Calp Limestone | 26 | - | 24 | - | 45000 | 38 |

# 8. RECOMMENDATIONS

The following section outlines the recommendations for the proposed development based on data obtained during the IGSL Ltd investigation. At the time of writing, it is understood that the development will comprise of two two-storey data centre buildings, a single-story gas-powered generation plant and an associated car park.

Whilst information is available on the proposed heights of the structures, at the time of writing no structural loadings have been provided and therefore the following sections only provide outline recommendations.

## 8.1 Foundations

Information from the Client states that the proposed developments will consist of a single-storey gas powered generation plant and an additional two two-storey data center buildings. Due to the absence of design loadings for the structures, no specific recommendation as to the foundation type that should be adopted is provided, particularly given the type and number of structures requiring foundations.

When the design loads are known, a detailed analysis into the suitability of shallow foundations should be undertaken. Where the structural loads cannot utilise the use of spread foundations, then the structures should be supported by piled foundations .

The Glacial Till is of varying thickness and therefore to avoid any risk of differential settlement spread foundations, strips up to 600 mm wide and pad up to 3.0 metres wide should be founded on the rock. It may be possible for lightly loaded structures that have a small footprint to have spread foundations or to even utilise the use of a raft foundation.

A piled foundation solution would involve a socketed pile into the Limestone Bedrock, typically up to 3.00 metres penetration into the rock, where the strength of the material would be adequate to support the structural loads. Bored cast in place concrete piles would be the most suitable option, utilising a specialised hard rock cutter to penetrate the Limestone Bedrock layer. Driven piles would be unsuitable for use within the Glacial Till, as the presence of large boulders and/ or cobbles could hinder construction, unless other plant was available on-site to remove the obstructions. In addition to this, driven piles would not be suitable for use in the limestone bedrock.

The piles will be supported by a combination of end bearing on the rock and shaft friction from the rock socket and Glacial Till. The depth to the top of the weathered rock is variable across the site, which will therefore result in the pile lengths being variable over the footprint of the main structures.

## 8.2 Retaining Structures

The following geotechnical parameters for use in retaining wall design have been recommended in accordance with BS 8002:2015 Code of practice for earth retaining structures, following derivation from Plasticity Index results.

**Table 8-1: Recommended geotechnical parameters for retaining wall analysis**

| Stratum | Geotechnical Parameters – Retaining Structures | | |
|---|---|---|---|
| | Bulk Density (kN/m²) | Plasticity Index (%) | Angle of Shearing Resistance (Φ´) |
| Possible Superficial Deposits | 20 | 18 | 27 |
| Glacial Till | 20 | 16 | 27 |

**8.3**

## 8.3 Pavement Design

A total of 45 laboratory CBR tests were performed on the Glacial Deposits, including 30 tests on the weathered Glacial Till and 15 on the Glacial Till. The test samples were taken from depths ranging from 0.5 mbgl to 0.6 mbgl. The results at natural moisture content range from 2.1% to 23.0% for the weathered Glacial Till, with only one value of 9% for the Glacial Till. The additional tests involved adding various volumes of lime/cement and curing them for either 3, 7 or 14 days.

In addition to the laboratory CBR tests, 26 Plate Load CBR tests were performed, of which 16 were performed on the Weathered Glacial Till and 10 on the Glacial Till. The tests were undertaken at depths ranging from 0.4 mbgl to 0.6 mbgl, with results for the Weathered Glacial Till ranging from 1.3% to 3.4% and the Glacial Till from 1.6% to 5.3%.

The CBR values are variable across the site, therefore, to achieve a minimum CBR value of 2.5%, it is recommended that localised areas where the strength of the cohesive soils are low be excavated and replaced with 1% lime, then cured for a minimum of 3 days.

Sections 5.2 and 5.3 give a more detailed description of what tests were involved.

## 8.4 Buried Concrete

Chemical laboratory tests were undertaken on samples from the superficial deposits at the site, to determine the aggressivity of the ground against buried concrete. Characteristic values for each soil type have been derived based on the size of the data set and guidance given in BRE Special Digest 1:2005 – Concrete in Aggressive Ground (3rd Edition).

The range of pH and water soluble sulphate within the tested soils is presented in Table 8-2.

**Table 8-2: pH and sulphate results**

| Stratum | pH Range | Range of Water Soluble Sulphate $SO_4$ 2:1 (mg/l) |
|---|---|---|
| Weathered Glacial Till | 8.5 to 9.4 | <0.010 |
| Glacial Till | 8.5 to 9.6 | <0.010 |

The design ACEC class has been derived based on Table C2 Brownfield Site from the BRE Special Digest 1 and taking groundwater to be mobile. Characteristic values have been calculated in accordance with BRE SD1, i.e. mean of either highest two results (data set of five to nine tests) or highest 20% (data set of ten or more tests).

**Table 8-3: Aggressive chemical environment for concrete**

| Stratum | ACEC Class |
|---|---|
| Weathered Glacial Till | AC-1 |
| Glacial Till | AC-1 |

## 8.5 Re-use of Site Material

The MCV tests for NMC produced results ranging from 9 to 14.2. A minimum MCV value of 8 is required for Class 2 soils, used in earthworks. The results indicate that the Possible Superficial Deposits meet this criterion. Results from the addition of lime, indicate that the MCV value increases, although this is not required to meet the criteria for Class 2 fill.

**Table 8-4: MCV test results**

| BH No. | Depth (mbgl) | MCV at NMC | MCV (%) 1% Lime | MCV (%) 2% Lime | MCV (%) 3% Lime |
|---|---|---|---|---|---|
| TP1 | 0.5 | 9 | 12.4 | 13.8 | 16.8 |
| TP3 | 1.0 | 14.2 | | | |
| TP6 | 0.6 | 10.6 | 12.6 | 17 | 17.2 |
| TP7 | 1.0 | 12 | | | |
| TP10 | 0.5 | 12.8 | | | |
| TP12 | 0.5 | 10.3 | 13.2 | 15 | 16.4 |

Notations

NMC = Natural Moisture Content

MCV = Moisture Condition Value

# 9. GEOTECHNICAL RISK REGISTER

| Risk | Description | Impact (1-5) | Probability (1-5) | Level of Risk | Mitigation |
|---|---|---|---|---|---|
| Unexpected/ unfavourable Ground Conditions | Risk of variable weathered rockhead across the site, requires different pile lengths. | 3 | 3 | 9 | Ensure foundations are constructed to a sufficient depth to be stable in all possible geologies.<br>Designer contacted immediately if ground conditions differ from what was anticipated.<br>Use experienced site geotechnical personnel to provide advanced warning of potential problems. |
| Obstructions to construction due to existing foundations | Risk of delay where former foundations are encountered. | 2 | 3 | 6 | Specification of demolition works to include the removal of existing foundations and replacement with compacted granular fill<br>Review archive information and drawings for the existing buildings and identify possible locations of foundations.<br>Contractor to develop and implement necessary measures to minimise the impact of relic foundations on construction. |
| Obstructions within the superficial deposits | Plant/ equipment damaged during foundation installation | 2 | 2 | 4 | Design to be based on the ground investigation data.<br>Utilise suitable foundation system (e.g. bored piles) |
| Encountering uncharted buried services | Risk of delay where uncharted services are encountered. Costs of repair, injury to personnel. | 4 | 1 | 4 | If, during foundation construction, an unexpected obstruction is discovered, cease immediately until it can be established what the obstruction is. CAT scanning must take place during foundation construction to mitigate this risk. Walkover surveys and stats searches will also lessen the likelihood of unknown services. |
| Unexpectedly high groundwater levels adversely affecting foundation/ formation levels | Groundwater encountered shallower than anticipated resulting in a decrease in working pile capacity/ reduction in FoS, or reduced bearing capacity for shallow foundations bearing on granular soils. | 4 | 2 | 8 | Utilise suitable foundation system (e.g. increase founding depth).<br>Dependent upon site observations<br>Designer contacted immediately if ground conditions differ from what was anticipated |

| Risk | Description | Impact (1-5) | Probability (1-5) | Level of Risk | Mitigation |
|---|---|---|---|---|---|
| Geological features, fissures, faults, dissolution features, etc which impact on design/ construction | Prescence of uplifted limestone rafts reduces shear strength of glacial deposits, resulting in lower FoS for foundations bearing capacity. | 4 | 2 | 8 | Use experienced site geotechnical personnel to provide advanced warning of potential problems. Contact designer in the event of encountering limestone void. |
| Pavement design | Risk of low strength formation soils. | 3 | 2 | 6 | In situ testing to be undertaken during construction to verify design CBR; excavate and remove low strength materials with compacted granular fill. |
| Contaminated ground/ groundwater | Environmental risks and/ or H&S risk to operatives/ public.<br>Delay to programme while material is disposed of/ remediated. | 3 | 2 | 6 | Refer to Ramboll Geo-environmental report (*ref: Main Environmental Statement Volume 1*). |
| Shrink Swell effects from clays present. | Structural damage unlikely as laboratory test results indicates low volume change potential or non-shrinkable soils. | 3 | 1 | 3 | Foundations to be designed in accordance with NHBC guidelines Chapter 4.2 'Building near trees'.<br>Where new planting is proposed Designer to consider choice of shrub/ sapling and adhere to guidance in Chapter 4.2. |
| Sulphates in ground attacking and weakening concrete buried structures | Reduction in strength of below ground concrete structures - potential failure of foundations. | 3 | 1 | 3 | Concrete classification design to be based on the ground investigation results. Concrete to be designed in accordance with guidelines given in BRE Special Digest1.<br>Designer to be notified should contamination 'hot spots' been countered during construction which may require ACEC classification to be reassessed. |
| Encountering UXO | Risk of injury or fatality to site operatives.<br>Risk of additional construction cost and programme delays | 4 | 1 | 4 | A review of the available information classified the site as 'low' risk. No anomalies encountered during GI but UXO may be present on-site and any future intrusive works should be appropriately risk assessed as per the guidelines in CIRIA C681. |

| | | Probability (P) | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Impact (I) | 1 | 1 | 2 | 3 | 4 | 5 |
| | 2 | 2 | 4 | 6 | 8 | 10 |
| | 3 | 3 | 6 | 9 | 12 | 15 |
| | 4 | 4 | 8 | 12 | 16 | 20 |
| | 5 | 5 | 10 | 15 | 20 | 25 |

| | Impact | Probability |
|---|---|---|
| 1 | Very Low | Highly Unlikely |
| 2 | Low | Unlikely |
| 3 | Medium | Possible |
| 4 | High | Likely |
| 5 | Very High | Highly Likely |

LOW - Normal Risk (rectified through standard procedures)

MEDIUM - Requires Special Attention / Measures

HIGH - Unacceptable Risk

# 10. REFERENCES

BGS, Geological Survey of Ireland 1:63,630 geological map drift series for Dublin, 1902

BRE Special Digest 1:2005 Concrete in Aggressive Ground 3rd Edition

Geological Survey of Ireland Interactive Map, 2021

BS 8002:2015 Code of practice for earth retaining structures

BS 8004:2015 Code of Practice for Foundations

BS 5930:2015 Code of Practice for Ground Investigations

BS EN 1997-1:2004 Eurocode 7: Geotechnical design – Part 1: General Rules

BS EN 1997-1:2004 Eurocode 7: Geotechnical design – Part 2: Ground Investigation and Testing

IGSL Ltd Factual Report (ref: 23300 Rev 1)

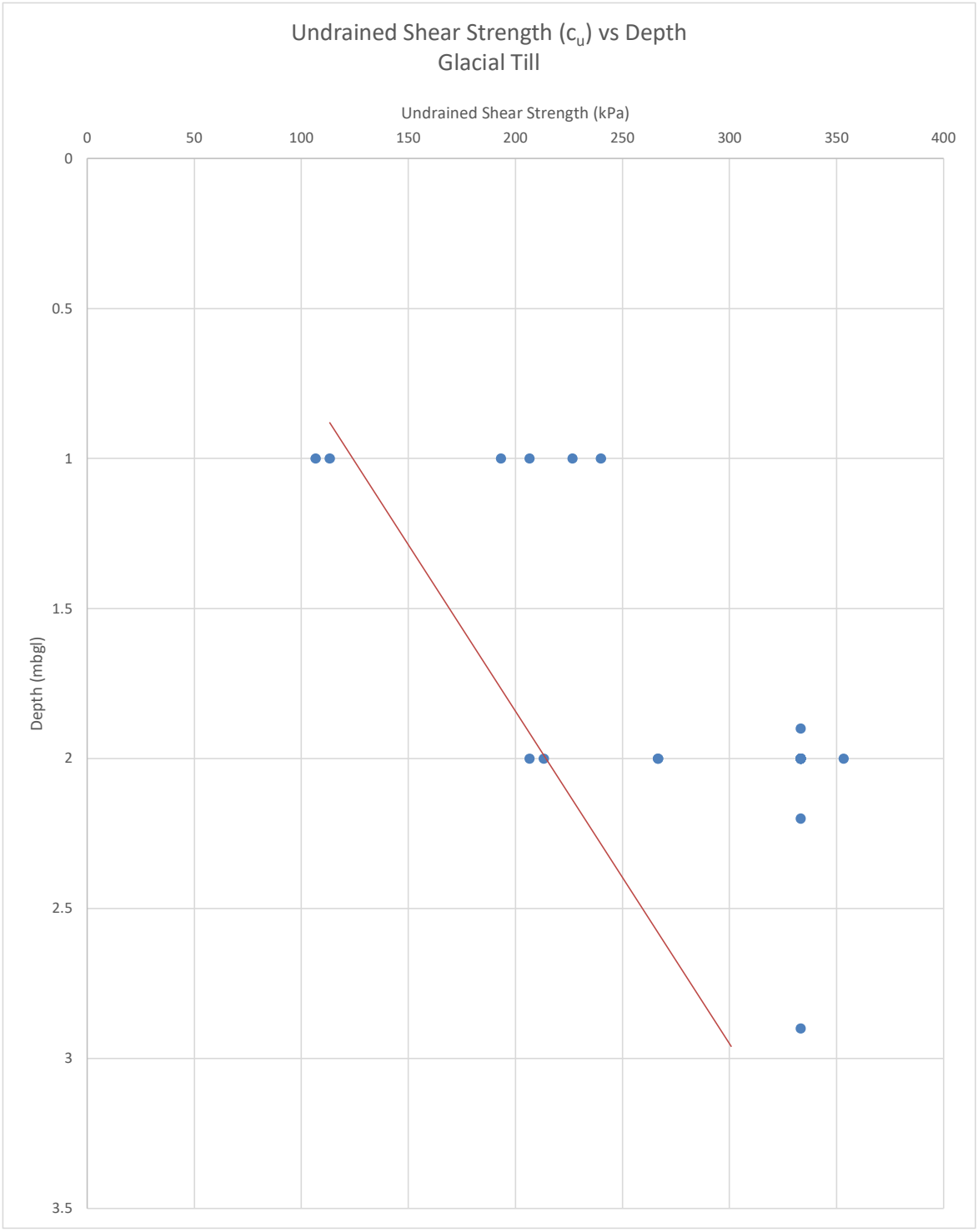
CIRIA C143 The Standard Penetration Test (SPT): Methods and Use

Volume 1: Main Environmental Impact Assessment Report

CIRIA C504 Engineering in Glacial Tills

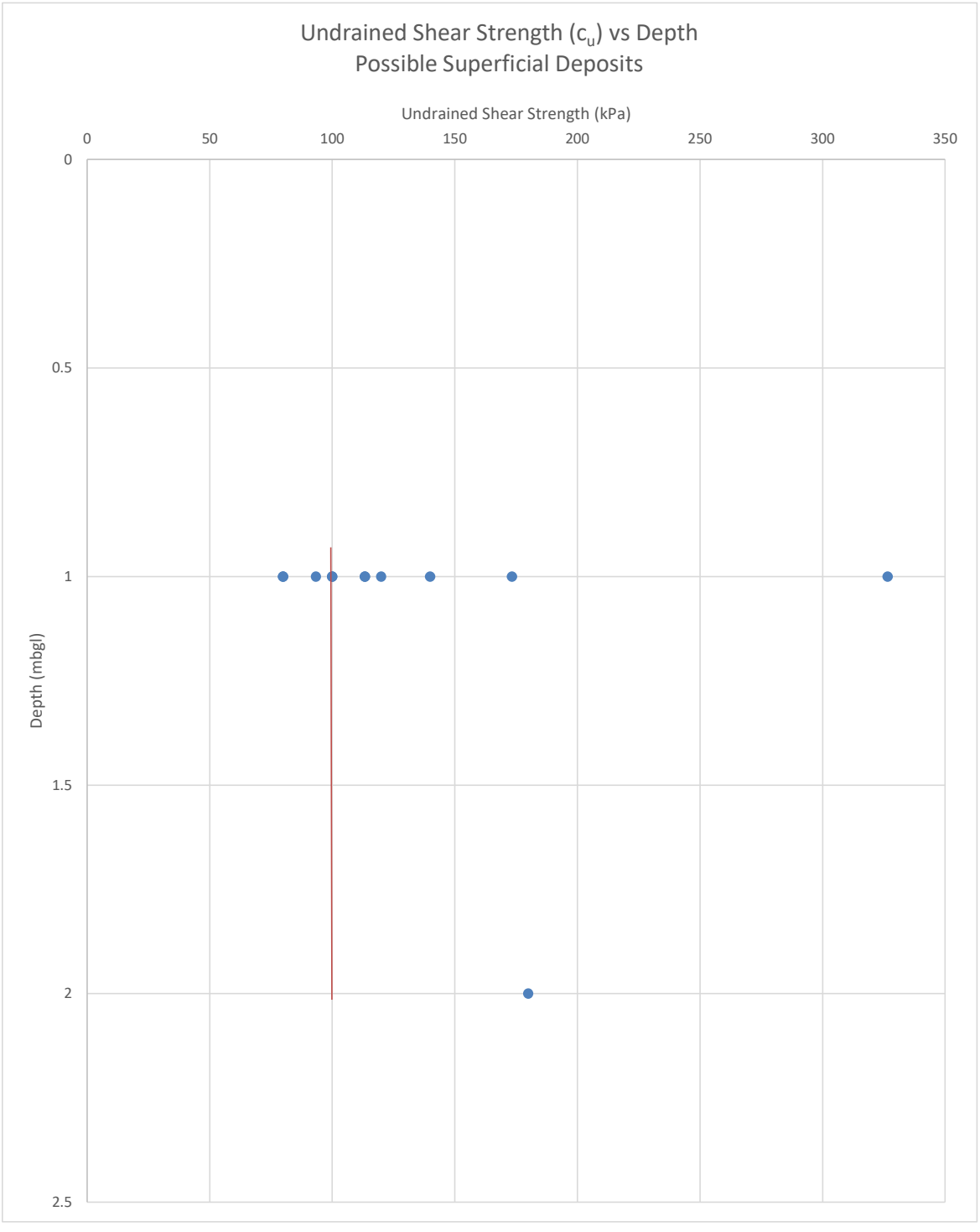
# APPENDIX A
# MATERIAL DATA PLOTS

| | | | | |
|---|---|---|---|---|
| RAMBOLL | **Project:** | Vantage Dublin | **Job No:** | RUK2021N00147 |
| | **Location:** | Dublin, Republic of Ireland | **Client:** | Vantage Data Centers |



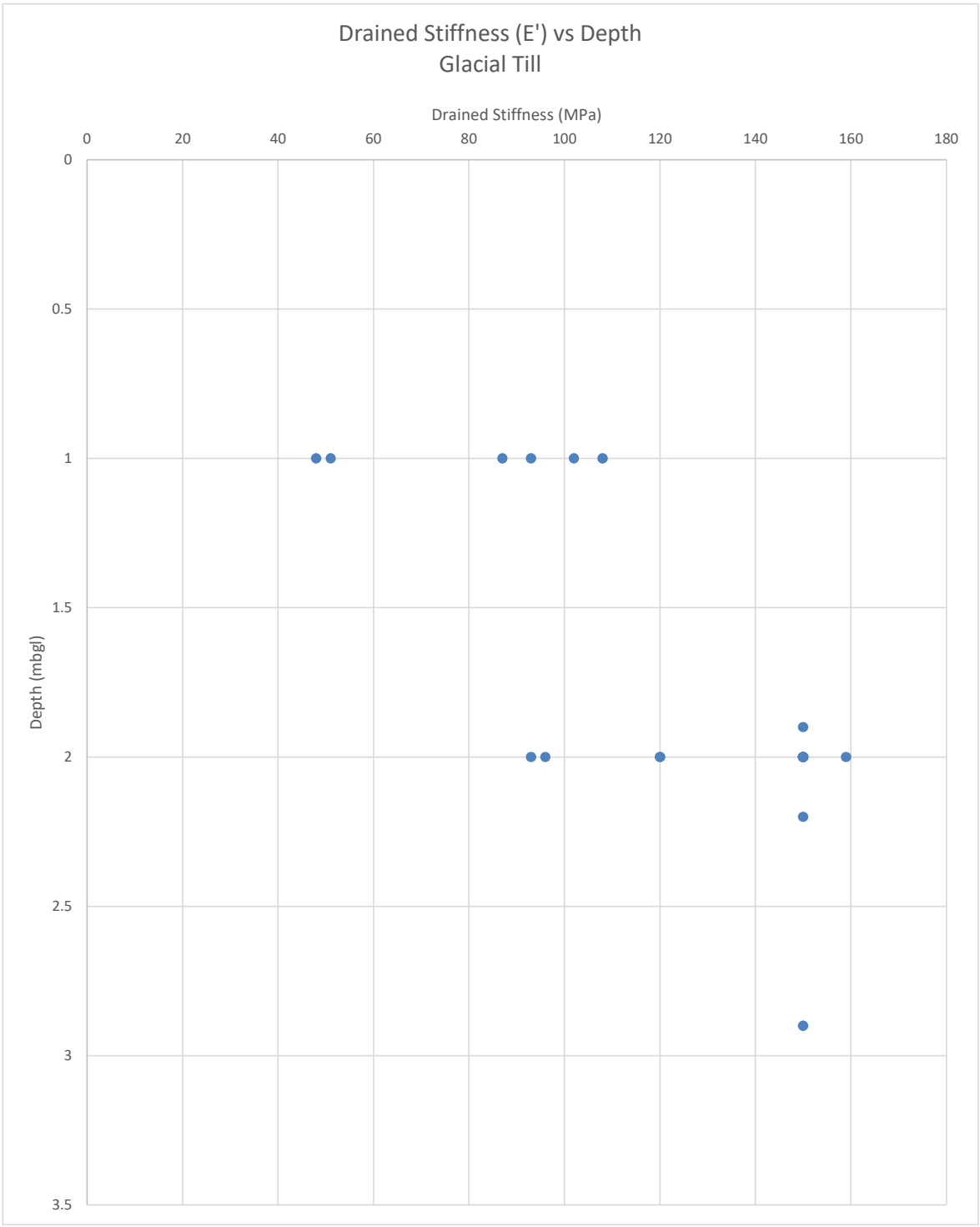

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Title:** | Cu vs Depth from SPT N | **Plot No.** | 2 | **Drawn:** | GH | **Date:** | 10/09/2021 |
| | | **Status:** | | **Checked:** | | **Date:** | |

| | | | | |
|---|---|---|---|---|
| RAMBOLL | **Project:** | Vantage Dublin | **Job No:** | RUK2021N00147 |
| | **Location:** | Dublin, Republic of Ireland | **Client:** | Vantage Data Centers |



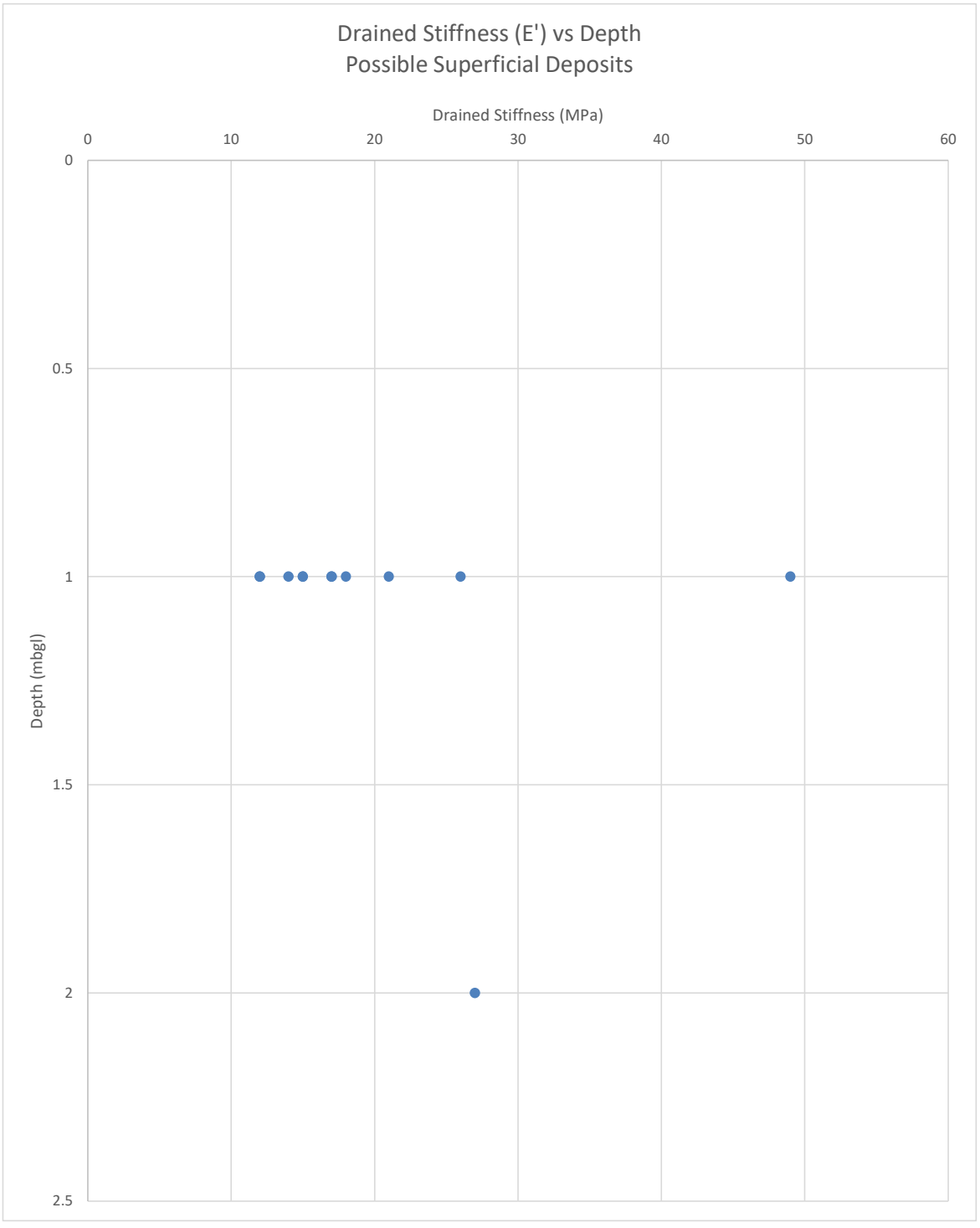

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Title:** | Cu vs Depth Possible Superficial Deposits | **Plot No.** | 1 | **Drawn:** | GH | **Date:** | 10/09/2021 |
| | | **Status:** | | **Checked:** | | **Date:** | |

| | | | | |
|---|---|---|---|---|
| RAMBOLL | **Project:** | Vantage Dublin | **Job No:** | RUK2021N00147 |
| | **Location:** | Dublin, Republic of Ireland | **Client:** | Vantage Data Centers |



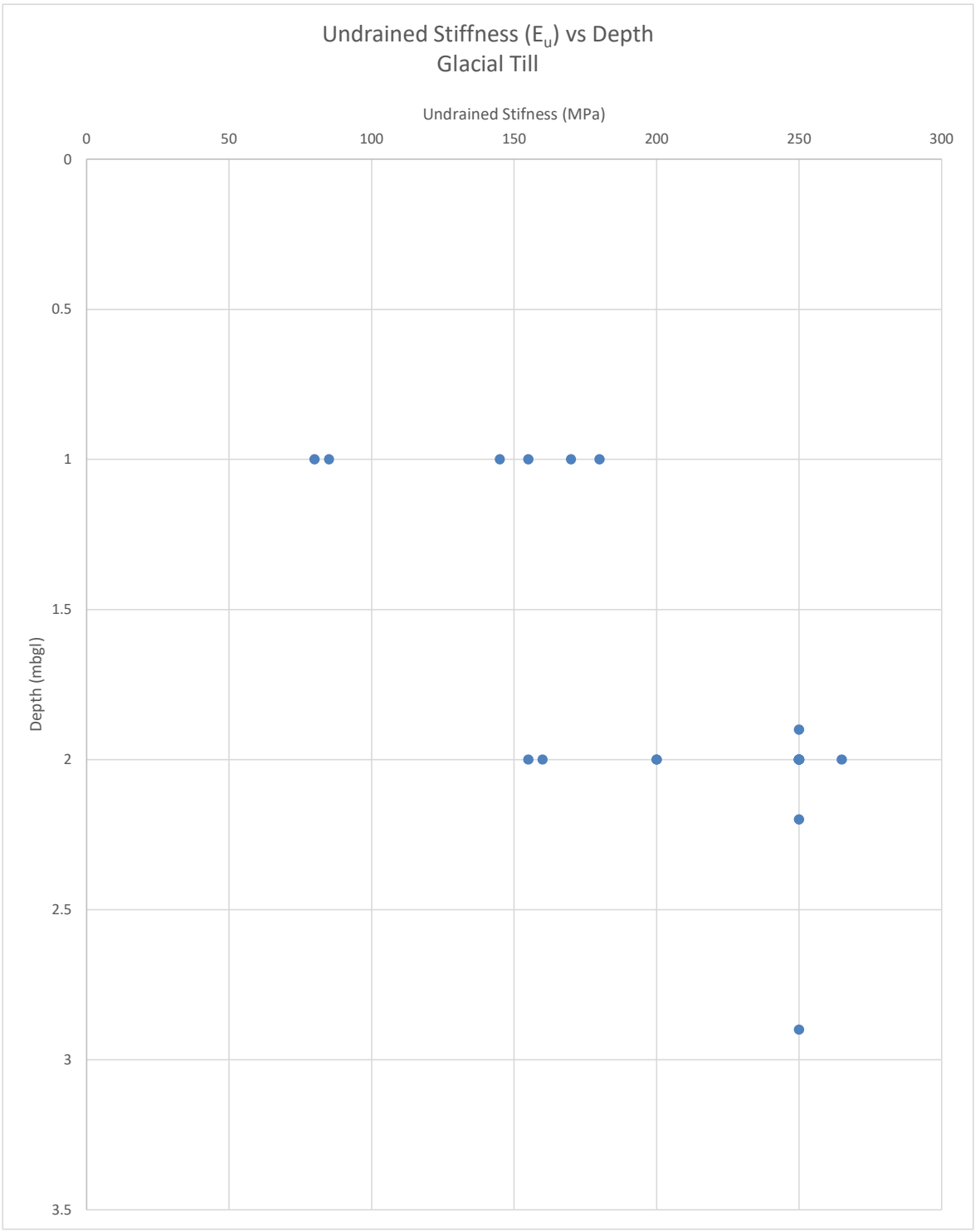

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Title:** | E' vs Depth Glacial Till | **Plot No.** | **6** | **Drawn:** | GH | **Date:** | 10/09/2021 |
| | | **Status:** | | **Checked:** | | **Date:** | |

| | | | | |
|---|---|---|---|---|
| RAMBOLL | **Project:** | Vantage Dublin | **Job No:** | RUK2021N00147 |
| | **Location:** | Dublin, Republic of Ireland | **Client:** | Vantage Data Centers |



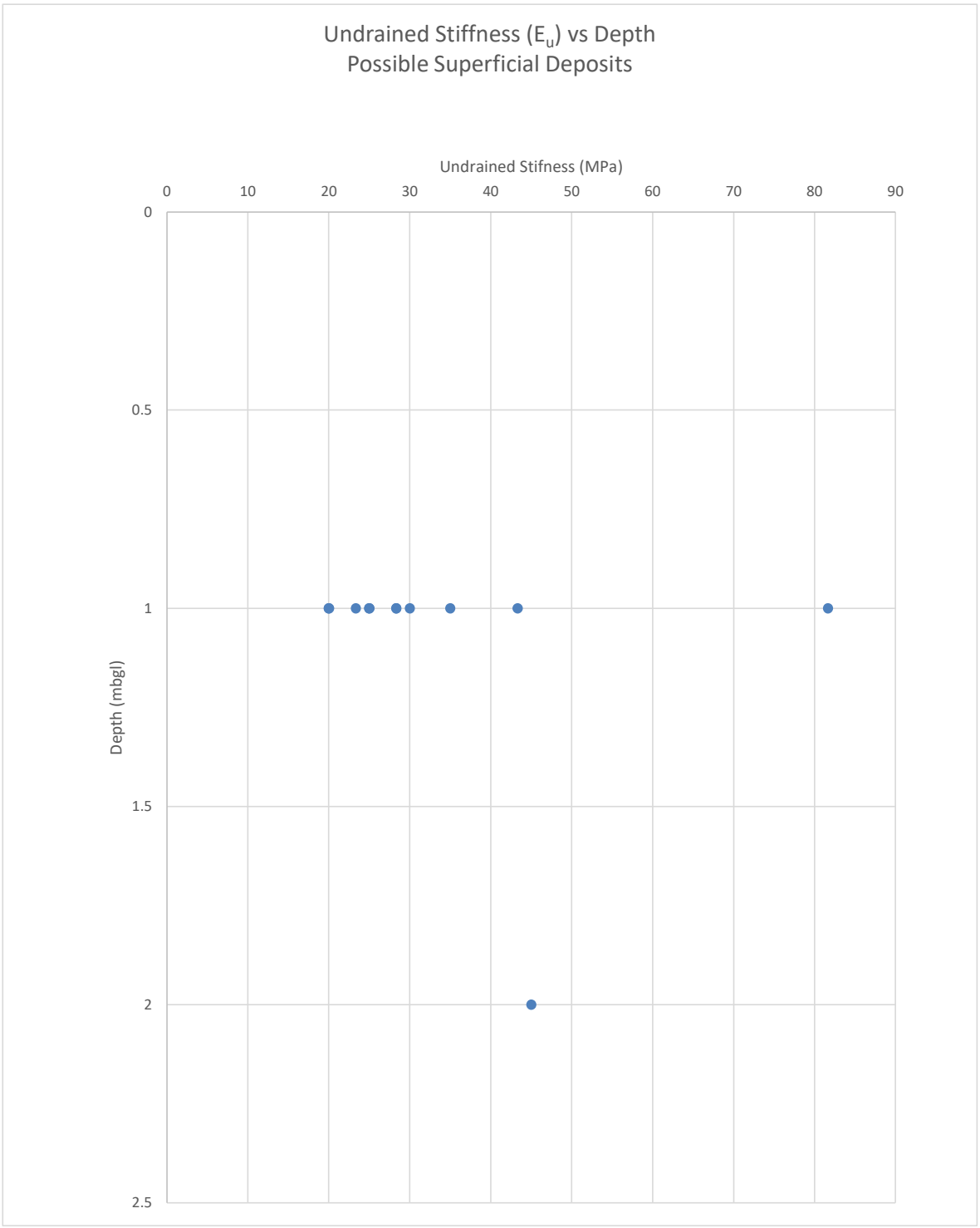

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Title:** | E' vs Depth Possible Superficial Deposits | **Plot No.** | **5** | **Drawn:** | GH | **Date:** | 10/09/2021 |
| | | **Status:** | | **Checked:** | | **Date:** | |

| RAMBOLL | Project: | Vantage Dublin | Job No: | RUK2021N00147 |
|---|---|---|---|---|
| | Location: | Dublin, Republic of Ireland | Client: | Vantage Data Centers |



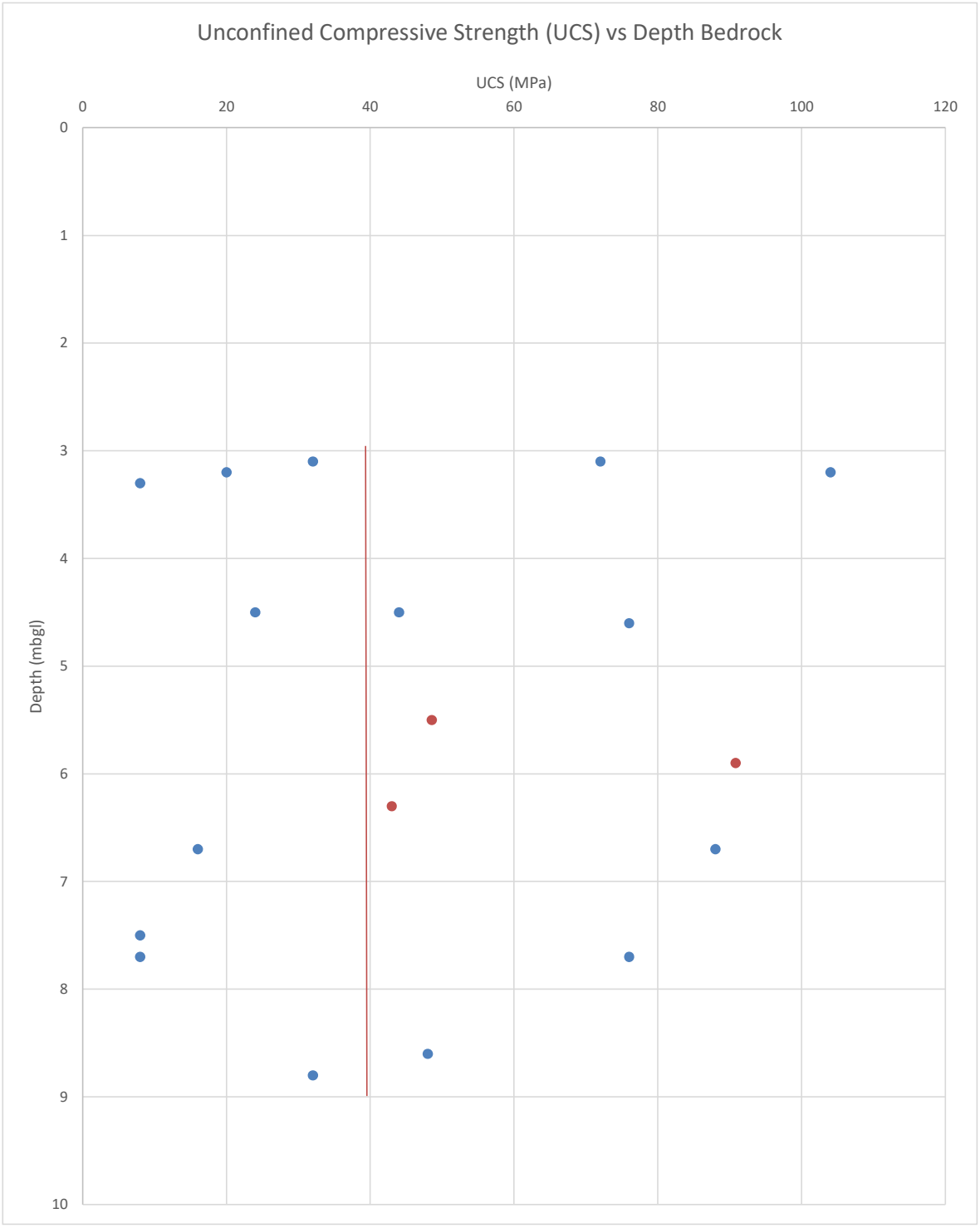

| Title: | Eu vs Depth Glacial Till | Plot No. | 4 | Drawn: | GH | Date: | 10/09/2021 |
|---|---|---|---|---|---|---|---|
| | | Status: | | Checked: | | Date: | |

| | | | | |
|---|---|---|---|---|
| RAMBOLL | **Project:** | Vantage Dublin | **Job No:** | RUK2021N00147 |
| | **Location:** | Dublin, Republic of Ireland | **Client:** | Vantage Data Centers |



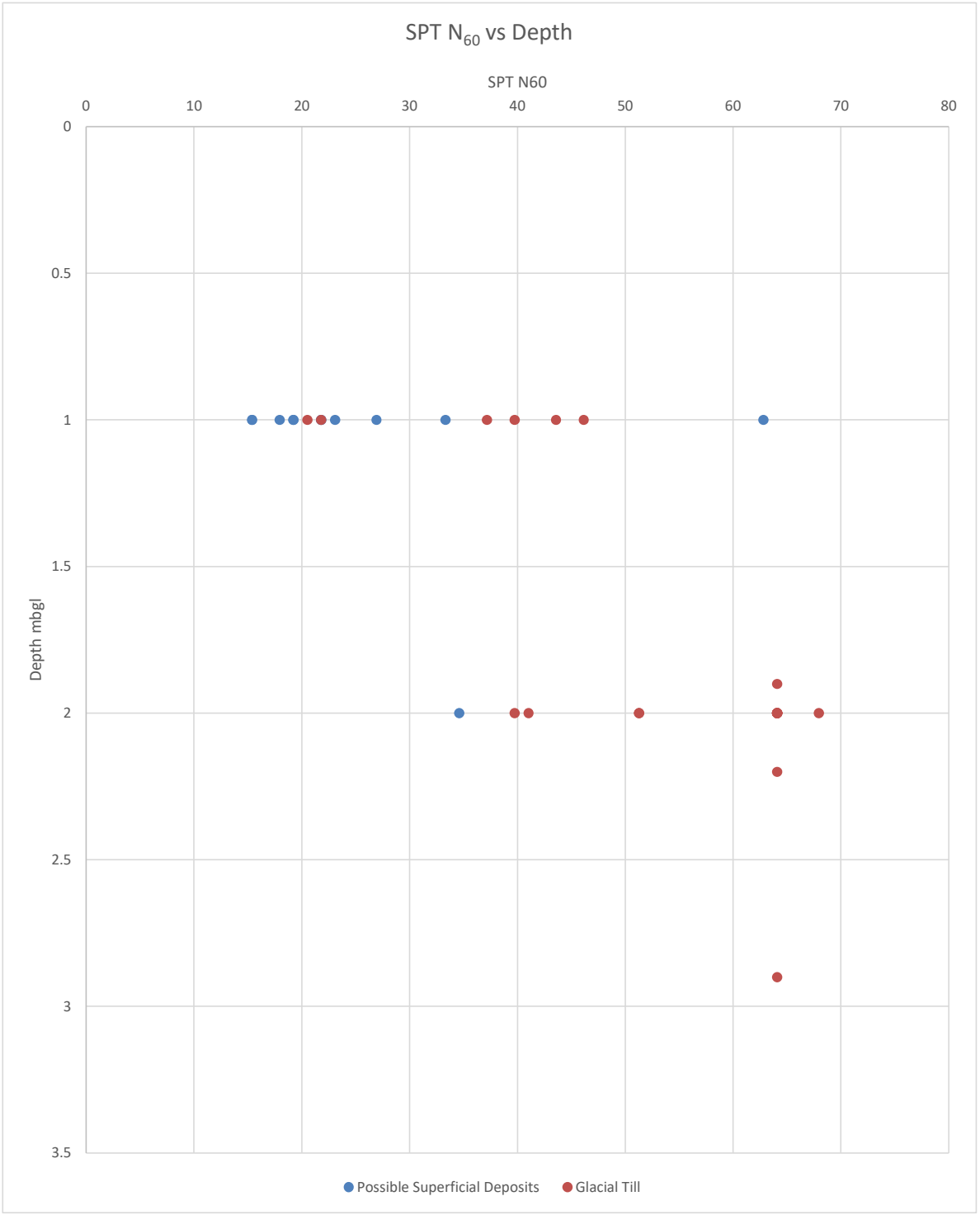

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Title:** | Eu vs Depth Possible Superficial Deposits | **Plot No.** | 3 | **Drawn:** | GH | **Date:** | 10/09/2021 |
| | | **Status:** | | **Checked:** | | **Date:** | |

| | | | | |
|---|---|---|---|---|
| RAMBOLL | **Project:** | Vantage Dublin | **Job No:** | RUK2021N00147 |
| | **Location:** | Dublin, Republic of Ireland | **Client:** | Vantage Data Centers |



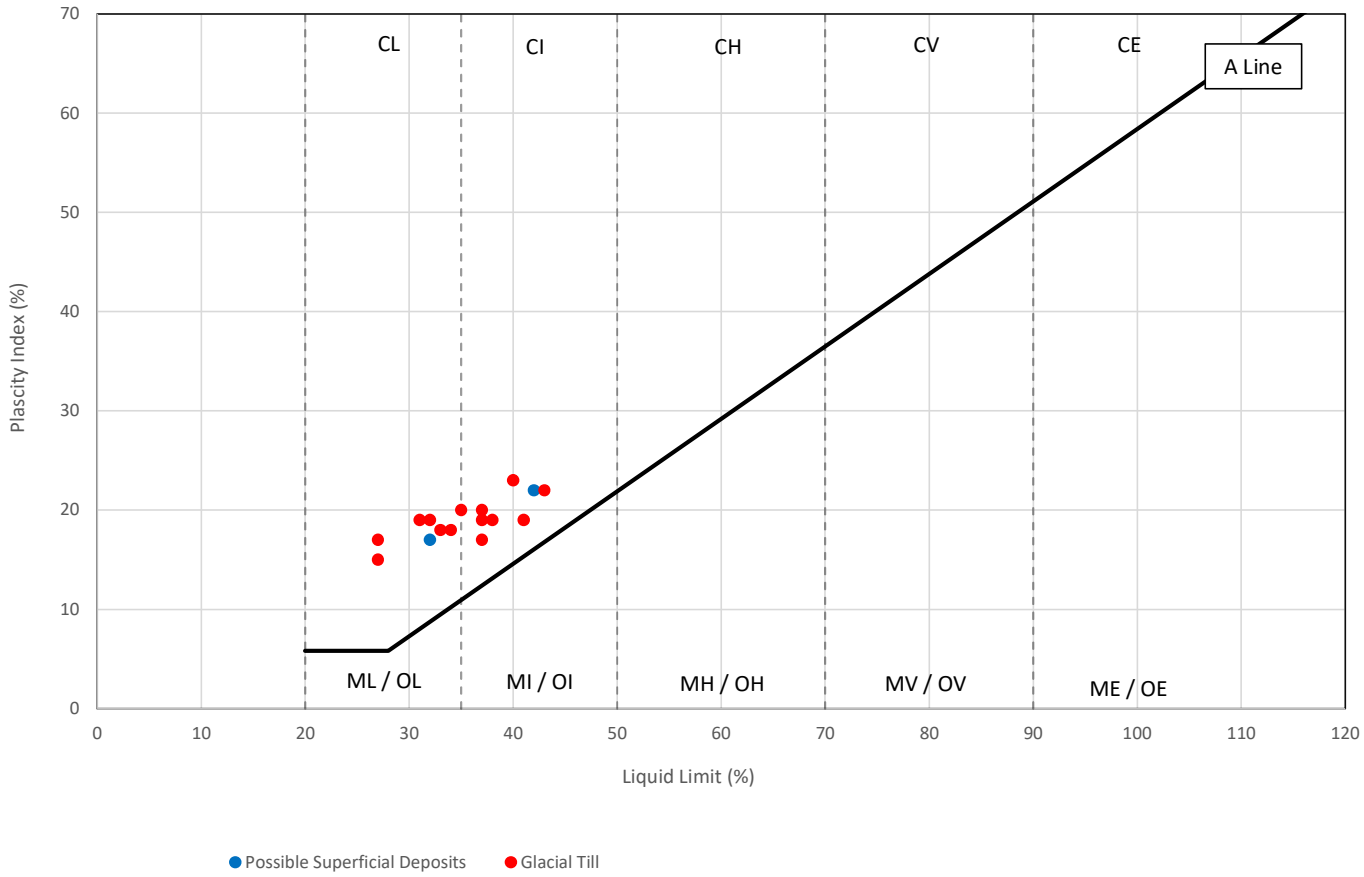

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Title:** | UCS vs Depth Bedrock | **Plot No.** | 7 | **Drawn:** | GH | **Date:** | 10/09/2021 |
| | | **Status:** | | **Checked:** | | **Date:** | |

| | | | | |
|---|---|---|---|---|
| RAMBOLL | **Project:** | Vantage Dublin | **Job No:** | RUK2021N00147 |
| | **Location:** | Dublin, Republic of Ireland | **Client:** | Vantage Data Centers |




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Title:** | SPT $N_{60}$ vs Depth | **Plot No.** | 8 | **Drawn:** | GH | **Date:** | 10/09/2021 |
| | | **Status:** | | **Checked:** | | **Date:** | |

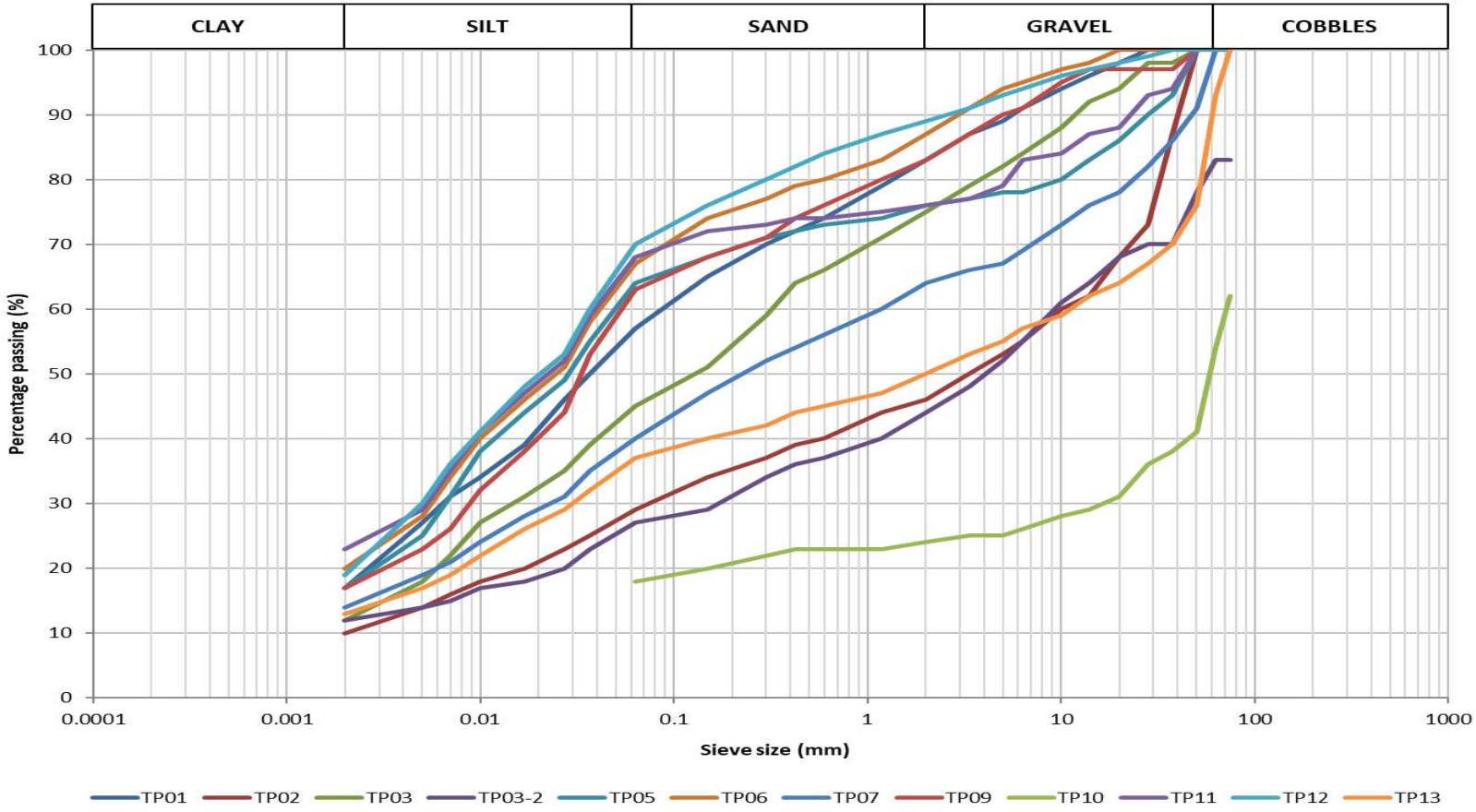
| | | | |
|---|---|---|---|
| RAMBOLL | **Project:** Vantage Dublin | **Job No:** | RUK2021N00147 |
| | **Location:** Dublin | **Client:** | Vantage Data Centers |




C = Clay, M = Silt, O = Organic

| | | | | | |
|---|---|---|---|---|---|
| **Title:** Summary Plasticity Chart | **Plot No** 8 | **Status:** | **Drawn:** GH | **Date:** | 15/09/2021 |
| | | | **Checked:** | **Date:** | |

| | | | |
|---|---|---|---|
| RAMBØLL | **Project:** Vantage Dublin | **Job No:** | RUK2021N00147 |
| | **Location:** Dublin | **Client:** | Vantage Data Centers |




| | | | | | |
|---|---|---|---|---|---|
| **Title:** Particle size distribution (PSD) for Glacial Till | **Plot No** 9 | **Status:** | **Drawn:** GH | **Date:** | 16/09/2021 |
| | | | **Checked:** | **Date:** | |

# APPENDIX 4

## CONTAMINATED LAND INTERPRETATIVE REPORT

Intended for

**Vantage Data Centers Dublin 11 Limited**

Date

**August 2021**

Project Number

**1620012232**

# VANTAGE DATA CENTERS, DUBLIN CONTAMINATED LAND INTERPRETATIVE REPORT

RAMBOLL

# VANTAGE DATA CENTERS, DUBLIN
# CONTAMINATED LAND INTERPRETATIVE REPORT

| | |
|---|---|
| Project Name | **Vantage Data Centers, Dublin** |
| Project No. | **1620012232** |
| Recipient | **Vantage Data Centers Dublin 11 Limited** |
| Issue No. | **P01** |
| Document type | **Report** |
| Date | **04/08/2021** |
| Made by | **Hazel Comyn** |
| Checked by | **Phil Studds** |
| Approved by | **Phil Studds** |
| Document no. | **1620012232-CLIR-01** |
| Intended for purpose | **For Information** |

Made by: 

Checked/Approved by: 

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### Version Control Log

| Revision | Date | Made by | Checked by | Approved by | Description |
|---|---|---|---|---|---|
| P01 | 05/08/2021 | HC | PS | PS | Final issue |

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# CONTENTS



# APPENDICES

# 1. INTRODUCTION

## 1.1 Brief

Ramboll UK Limited (Ramboll) has been appointed by Vantage Data Centers Dublin 11 Limited (hereby referred to as Vantage, the Client) to support the proposed development of two proposed data centers (the 'proposed development') on the Profile Park Site, Kilmatead (the 'site'), situated within the jurisdiction of South Dublin County Council (SDCC)the proposed development.

This report provides an assessment of risks associated with ground contamination. This report does not cover any issues other than those relating to contaminated land. For example, no geotechnical, ecological or archaeological studies are included in the scope of this report.

## 1.2 Previous Reports

An Environmental Impact Assessment Report (EIAR) has been prepared for Vantage - in accordance with the statutory procedures set out in the Planning and Development Act 2000 (as amended)[1] (the 'Act') and the Planning and Development Regulations 2001 (as amended)[2] (the 'Regulations') – to accompany an application (the 'application') seeking permission (also known as 'full permission') for two proposed data centers (the 'proposed development') on the Profile Park Site, Kilmatead (the 'site'),

Geology and soils (and contamination) desk study information has been provided in Chapter 6 of the EIAR covering ground conditions and site history which allowed an initial indication of potential ground contamination risks at the site. A ground investigation was completed by IGSL Ltd. in 2021 to provide data on ground conditions and quantify any ground contamination impacts in soils and groundwater/surface water at the site. This was provided to Ramboll in the following document: IGSL Ltd, 2021. Ground Investigation & Geotechnical Report Project No 23300.

This contaminated land risk assessment is based on the factual information provided by IGSL Ltd. 2021.

## 1.3 Proposed Development

It is understood that the development will consist of the demolition of the existing single storey dwelling and outbuilding (c. 209sqm) and the construction of two no. two storey data centers with a gross floor area of c. 36,336sqm. The development includes c. 1,354sqm of office space across both data centers.

The northern data center comprises of a two storey data center of 12,573sqm that will include 11 no. standby emergency generators with associate flues (each 25m in height) to be located to the west of the building. The southern data center comprises of a two storey data center of 23,763sqm that will include 22 no. standby emergency generators with associate flues (each 25m in height) to be located to the west of the building. Both data centers will be c. 14.5m to parapet height with the roof plant increasing the height to 18.5m overall.

The data centers will be served by 144 car parking spaces that will be located generally to the east of the data centers, of which 8 no. spaces will be disabled spaces and 14 of these spaces will be provided for electrical charging vehicles. Covered bicycle parking provision will be provided within the site.

The application will also include the construction of a gas powered generation plant in the form of a 13m high single storey building with a gross floor area of 4,725sqm that will contain 10 gas generators with associated flues that will be 25m in height, and grouped in pairs and threes. The Gas Plant will be located to the west of the larger data center.

[1] Government of Ireland, 2000. Planning and Development Act 2000 (as amended). ISB. S.I. No. 30/2000.
[2] Government of Ireland, 2001-2019. Planning and Development Regulations 2001 (as amended). S.I. No. 600 of 2001. ISB.

## 1.4 Objectives

The objective of this report is to identify potential contaminated land risks and constraints associated with the ground and groundwater conditions in the context of the proposed development, in accordance with current relevant legislation and guidance.

## 1.5 Scope of Works

The scope of works includes:

- Review of the IGSL Ltd, 2021 report to provide a discussion of environmental ground conditions across the site;
- Interpretation of the IGSL Ltd, 2021 data to provide a Generic Quantitative Risk Assessment which provides an initial screen of potential ground contamination risks associated with the proposed development;
- Provide comment on soil waste management;
- Present a refined Conceptual Site Model (CSM) and qualitative risk assessment based on the findings of the ground investigations and data interpretation using the source-pathway-receptor methodology; and
- Present recommendations based on the findings of the ground investigation and the refined CSM.

## 1.6 General Limitations and Reliance

This report has been prepared by Ramboll exclusively for the intended use by the Client in accordance with the agreement between Ramboll and the Client defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended or any other services provided by Ramboll.

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/ or compliance. This report and accompanying documents are initial and intended solely for the use and benefit of the client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

The site investigation works were undertaken during a discrete period of time. The findings and conclusions presented in this report are accordingly factually limited by these circumstances and, unless stated otherwise in the report, are preliminary. The field investigations were restricted to a level of detail necessary to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant period of time has elapsed since the sampling took place. The interpretation of the geological and environmental quality conditions is based on extrapolation from point-source data in a heterogeneous environment. Accordingly, more detailed investigation may be appropriate dependent upon the client objectives.

# 2. SITE SETTING

## 2.1 Site details

The site is located at Irish grid reference O 03687 30780, within Profile Park, as shown in Figure 1.1 in Appendix A.

Geographically, the site is located in Profile Park, approximately 10 kilometres (km) to the south-west of Dublin city centre, within South Dublin County.

The site is an irregular parcel of land and covers a total area of approximately 8.7 ha.

The site consists of mostly flat agricultural land with the land surrounding the site comprising a mixture of agricultural, residential and industrial uses. There are two residential properties in the vicinity of the site on the northern boundary adjacent to the R134 New Nangor Road, one of which is vacant and within the site and one which is occupied to the immediate north east of the site. Bolands Car Centre (a motor sales business) is present to the immediate west of the site. Several data centre developments are under construction or are operational in the vicinity of the site.

The existing Baldonnal Stream runs through the site in a south-east to north-west direction, flowing towards the north-west.

The site is accessed from one access/egress point from Profile Park Road to the south, which leads to a roundabout on the R134 New Nangor Road.

The site's surrounding context is predominantly industrial to the north and west, agricultural to the south and west, with commercial and residential properties to the east and the Grange Castle Golf Club to the south-east (refer to Figure 1.2).

The site boundaries are defined by:

- New Nangor Road (R134) to the north, beyond is an industrial park;
- Agricultural fields to the east, beyond which is Profile Park Road and Grange Castle Golf Club;
- Profile Park Road and roundabout to the south; and
- A data center development on agricultural fields and Bolands Car Garage to the west.

## 2.2 Potential sources of contamination

Due to the lack of development at the site and the historical agricultural use, the risk of contaminated soils being present onsite is considered low. There is a potential risk, albeit low, associated with migration of contaminants from the adjacent Bolands Garage, although it is noted that this land use is hydraulically down/cross gradient from the site.

Ground investigation was designed and completed to quantify any ground contamination risks.

# 3. GROUND INVESTIGATION

## 3.1 Investigation Design

Pinnacle Consulting Engineers (project engineer) provided a ground investigation design, described in Appendix 2. The 2021 ground investigation was then designed in detail and carried out by IGSL Ltd.

The supplementary site investigation included soil and groundwater sampling, ground gas monitoring of newly installed wells and laboratory analysis of soils and groundwater for potential contaminants.

The scope also includes for geotechnical investigation requirements. The results of the geotechnical assessment are not discussed in this report.

## 3.2 Ground Investigation Activities

The ground investigation was completed by IGSL Ltd, in May 2021. All works completed are detailed in the below referenced factual report which should be read in conjunction with this interpretative report:

- IGSL Ltd, 2021. Ground Investigation & Geotechnical Report Project No 23300.

In summary the ground investigation works comprised:

- Trial pits (13 No.);
- Cable percussive boreholes (17 No.);
- Rotary core drillholes (3 No.) all installed with groundwater monitoring wells;
- Plate load tests (13 No.);
- Soakaway / infiltration tests (3 No.);
- Geophysical survey (in-situ resistivity);
- Groundwater monitoring; and
- Surveying of exploratory locations

Soil samples were submitted for a range of determinands. No particular types of potential contaminants were identified from the current and historical use of the site therefore the 2021 ground investigation carried out by ISGL included a typical contaminated land chemical testing suite comprising of; heavy metals, petroleum hydrocarbons, asbestos, organic contaminants such as polycyclic aromatic hydrocarbons (PAHs).

Groundwater samples were retrieved from three locations and surface water samples from two locations on one occasion, and sent to the laboratory for chemical analysis for the determinands including heavy metals and hydrocarbons.

All factual data including exploratory hole logs, and laboratory certificates are provided within the aforementioned IGSL Ltd, 2021.

Exploratory hole and sampling locations are shown on Figure 3, reproduced in Appendix A.

# 4. GROUND CONDITIONS ENCOUNTERED

## 4.1 Ground Conditions

The ground conditions encountered on site during the ground investigation (IGSL Ltd, 2021) are described in Table 4.1 below.

**Table 4.1: Summary of encountered ground conditions**

| Stratum | Typical Description | Range of Depth encountered (m bgl) | Range of Thickness Encountered (m) |
|---|---|---|---|
| **Topsoil** | Topsoil | Surface | Typically 0.3, occasionally to 0.5 |
| **Glacial deposits** | Firm grey and brown CLAY/SILT or SILT, low cobble content. | Typically 0.3. Occasionally not recorded. | Typically 0.20 – 0.5. Occasionally not recorded. |
| **Glacial deposits** | Stiff grey CLAY occasionally described as SILT/CLAY | 0.3 - 0.8 | 0.5->1.8 |
| **Limestone** | Weak grey shaley Limestone | 1.1 - >2.6 | Not proven |

The ground conditions encountered across the site are generally comparable to the geology described on the GSI map for the area which indicates that the site is underlain by the undifferentiated Dublin Calp Limestone.

## 4.2 Groundwater

Groundwater strikes were noted as seepage, slow or moderate inflows in a few boreholes within the stiff clays. The majority of locations recorded no groundwater.

Groundwater monitoring after drilling identified water resting levels at 0.97 – 1.89m in three installed boreholes.

## 4.3 Field Evidence of Contamination

No visual or olfactory observations of contamination noted.

# 5. HUMAN HEALTH ASSESSMENT

The guidance document entitled 'Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites', published by the Environmental Protection Agency of the Republic of Ireland[3] has been referred to when assessing the results of the chemical analyses.

## 5.1 Assessment Approach

There are no statutory thresholds in Ireland for the assessment of soil contamination. For human health, the EPA recommends the use of GAC (generic assessment criteria), based on the UK Environment Agency Contaminated Land Exposure Assessment (CLEA) model, either produced by the UKEA itself or values generated using the CLEA model by reputable third-party organisations. Where GAC have not been published or if practitioners do not use human health GAC publications, values should be generated by appropriately qualified and experienced professionals using the CLEA model for consistency with the EPA approach.

Ramboll has derived GAC for the interpretation of soil and groundwater chemical analyses. The GAC are threshold-based screening criteria, below which a significant risk is not considered to be present. Contaminants at concentrations above the GAC do not infer an unacceptable risk; rather that further assessment is required to more fully understand potential contamination risks.

The Ramboll GAC for human health assessment are based on the generic scenarios outlined in the CLEA methodology and guidance documents, and include inhalation, ingestion, dermal contact of/with soil and dust and inhalation of volatiles as pathways for commercial and residential scenarios, as well as ingestion of homegrown produce for residential with gardens scenario. These have been calculated by use of CLEA Version 1.071.

Exceedances detected during the GAC screening are assessed further in the context of a qualitative source-pathway-receptor risk assessment presented in Section 7. This assessment has considered risk to human health in the context of the development of the Site for commercial / industrial purposes. As such, Ramboll has referred to GAC for commercial / industrial site use.

## 5.2 Results

The soil analytical results obtained during the ground investigations have been screened against the Ramboll GAC for commercial/industrial end use suitable for assessment of the proposed data centre use.

A total of 13 soil samples were analysed for a range of metals, PAHs, TPH and PCBs. The results have been screened against the appropriate GAC; the full screening sheets can be found in Appendix 3 showing all data and comparison to the GAC.

All measured concentrations were below the GAC indicating no significant risks to human health from soils for the proposed site use.

[3] Available at https://www.epa.ie/pubs/advice/waste/contaminatedland/contaminatedland/Guidance_on_the_Management_of_Contaminated_Land_and_Groundwater_at_EPA_Licensed_Sites_FINAL.pdf

# 6. WATER ENVIRONMENT ASSESSMENT

## 6.1 Assessment Approach

'Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites' indicates that values for screening of the impact on groundwater may come from several sources, including the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. no. 9 of 2010), the EPA's Groundwater Threshold Values (GTVs), the EPA's Interim Guideline Values (IGVs), and drinking water standards or relevant Environmental Quality Standards (EQSs), these latter for when considering a surface water receptor.

Concentrations of determinands (where detected in excess of laboratory reporting limits,) were assessed against the published quality standards for groundwater for initial screening purposes.

Exceedance of screening criteria does not infer that an unacceptable risk is present. In line with the risk-based approach taken in Ireland, the outcome of the screening is qualitatively assessed in the context of the conceptual Site model, to determine whether there is a viable (or potentially viable) source-pathway-receptor (S-P-R) linkage present between the contamination and a receptor. The conceptual Site model is presented in Section 7.

If there is no S-P-R linkage (for example there is no pathway for the release to migrate, or a receptor is not present) then it can be inferred that the contamination does not pose a risk. The qualitative source-pathway-receptor risk assessment is presented in Section 8.

## 6.2 Water Analytical Results

A total of three groundwater samples and two surface water samples were retrieved and analysed for a suite of metals and hydrocarbons.

In addition, 13 soil samples were analysed for leachable contaminants including pH, ammonium and benzo(j)fluoranthene.

The water and leachate concentrations are presented in comparison to the GAC protective of potable water supply and surface water environment in Appendix 3.

None of the leachate data exceeded the GAC suggesting that the soils on site do not present a significant source of contamination to the water environment.

The groundwater and surface water sample data were very similar and identified only cyanide and nickel above the GAC.

Nickel was recorded marginally in exceedance of the bioavailable GAC of 4ug/l in both shallow ground and surface water samples. The maximum nickel concentration recorded was 5.9ug/l in one of the surface water samples. In order to calculate the bioavailable fraction from the measured concentrations, additional site specific parameters are needed which were not include in the analytical suite. However, typically the bioaccessible fraction would be less than half, which would suggest this nickel impact will not pose a significant risk to the water environment.

The slightly elevated cyanide concentrations recorded is consistent across the site in both groundwater and surface water. No cyanide was recorded in soils above the laboratory method detection limit, this indicates there is no source of cyanide on site. The impact may be a result of off-site diffuse contamination or natural background concentrations. As the cyanide concentrations are only approximately double the DWS and there is no on site source of the cyanide in the site soils, it is considered that these levels are not significant in the context of the site as there most likely reflect background concentrations.

No significant risk to the water environment has been identified from the available data.

# 7. SOURCE-PATHWAY-RECEPTOR RISK ASSESSMENT

**Sources:**

- There are no potentially significant contaminative activities on-site;
- No significant visual or olfactory field evidence of contamination within soils or groundwater has been found on the site;
- Very low levels of soil contamination were recorded typical of a greenfield site at concentrations that do not present a significant risk to potential receptors have been found on-site;
- Low levels of contamination in groundwater typical of a greenfield site and representative of general background groundwater quality in the site's urban industrial setting have been found on-site. Contamination detected does not present a significant risk to potential receptors;
- No asbestos was detected on site; and
- No significant potential off-site contamination sources have been identified.

In summary, no significant soil or groundwater impacts have been identified which may pose a risk to human health or the water environment based on the data available and the currently development proposals.

In the absence of any contamination sources, no further risk assessment is required.

# 8. SOIL WASTE MANAGEMENT

## 8.1 Methodology

The assessment has been undertaken using available soil chemical data and HazWasteOnline™, a web-based tool for classifying waste. The software utilises UK Environment Agency guidance and European regulations to classify samples in line with current requirements.

## 8.2 Soils Assessment

The analytical results for 21 soil samples were entered into HazWasteOnline™ to provide a preliminary waste classification assessment. The HazWasteOnline™ output sheets are provided in Appendix 4.

All of the samples were classified as 'non-hazardous'.

## 8.3 Landfill Acceptance Criteria Testing

Thirteen (13) soil samples were submitted for indicative laboratory Waste Acceptance Criteria (WAC) testing. The laboratory testing comprises generation of a leachate from the soil sample, which is subsequently analysed for a specific set of determinants against three landfill acceptance criteria. These are: Inert Waste Landfill, Stable Non-reactive Hazardous Waste (in non-hazardous landfill), and Hazardous Landfill.

The results of the WAC testing are presented in Appendix 5.

All 13 samples analysed do not exceed the 'Inert Waste Landfill' criteria. Should this material be designated for off-site disposal to landfill, the HazWasteOnline™ classification report and laboratory WAC testing results should be passed for review by the receiving landfill.

## 8.4 Summary

Based on the information available, the Made Ground will be classed as 'non-hazardous'.

Any material different from the encountered material during the ground investigation, and any material with visible contamination should be separated from the remaining soils.

The classification of waste reported above must be confirmed by the receiving landfill prior to disposal, under Duty of Care. Any material to be disposed of as hazardous or inert must have WAC analysis provided to confirm appropriate class of landfill (with the exception of clean natural strata).

WAC testing was completed on 13 samples and indicated that these soils may be suitable for acceptance in an inert landfill.

# 9. CONCLUSIONS AND RECOMMENDATIONS

## 9.1 Conclusions

### 9.1.1 Soil and Groundwater Contamination

No significant soil or groundwater impacts have been identified which may pose a risk to human health or the water environment based on the data available and the currently development proposals.

### 9.1.2 Soil Waste Management

Based on the information available, the Made Ground will be classed as 'non-hazardous'.

Any material different from the encountered material during the ground investigation, and any material with visible contamination should be separated from the remaining soils.

The classification of waste reported above must be confirmed by the receiving landfill prior to disposal, under Duty of Care. Any material to be disposed of as hazardous or inert must have WAC analysis provided to confirm appropriate class of landfill (with the exception of clean natural strata).

Any material to be disposed of as hazardous or inert waste must have WAC analysis provided to confirm appropriate class of landfill. WAC testing completed on 13 samples and indicated that the soil may be suitable for acceptance in an inert landfill.

## 9.2 Recommendations

Should the reuse of site won material be required, then best practice dictates that the reuse should be carried out in accordance with an appropriately designed Material Management Plan, typically using procedures given in the CL:AIRE, 2011 Definition of Waste: Code of Practice (DoWCoP).

To conform with DoWCoP, the following items will be required:

- Remedial statement/strategy including, *inter alia,* a methodology for the management of unsuspected contamination which may be encountered during works including for consultation with an appropriately qualified environmental consultant, stockpiling and additional chemical testing / assessment prior to re-use;
- Material management plan (earthworks strategy); and
- Production of a Validation Report.

An environmental watching brief by an appropriately qualified environmental consultant is recommended, in particular during the earthworks phases of development, with subsequent validation sampling in accordance with the methodology outlined within the Material Management Plan/Remediation Strategy. This will allow an independent verification report to be prepared which will be required after works are complete.

# APPENDIX 1
# FIGURES AND DRAWINGS

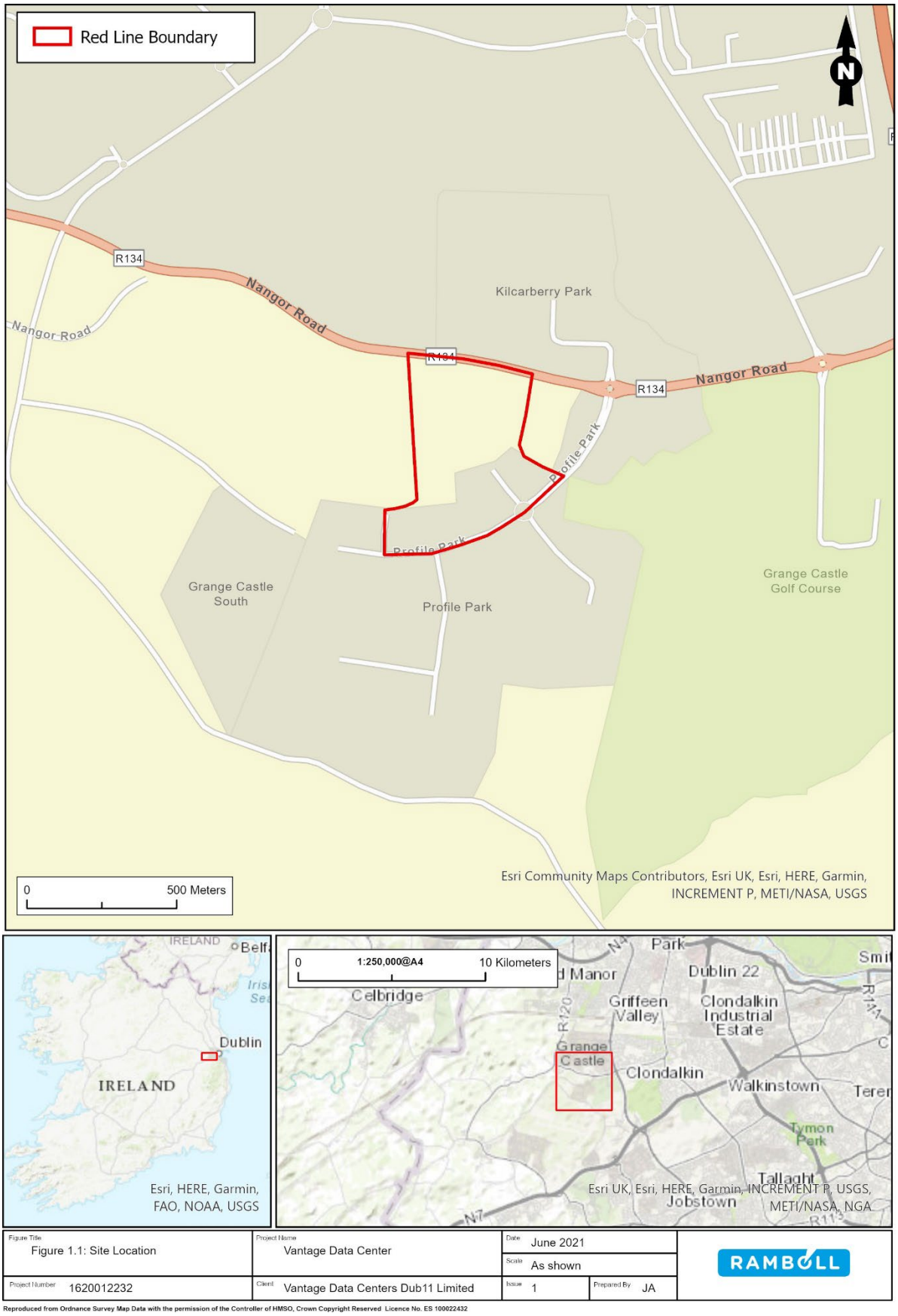



**Figure 1: Site Location**

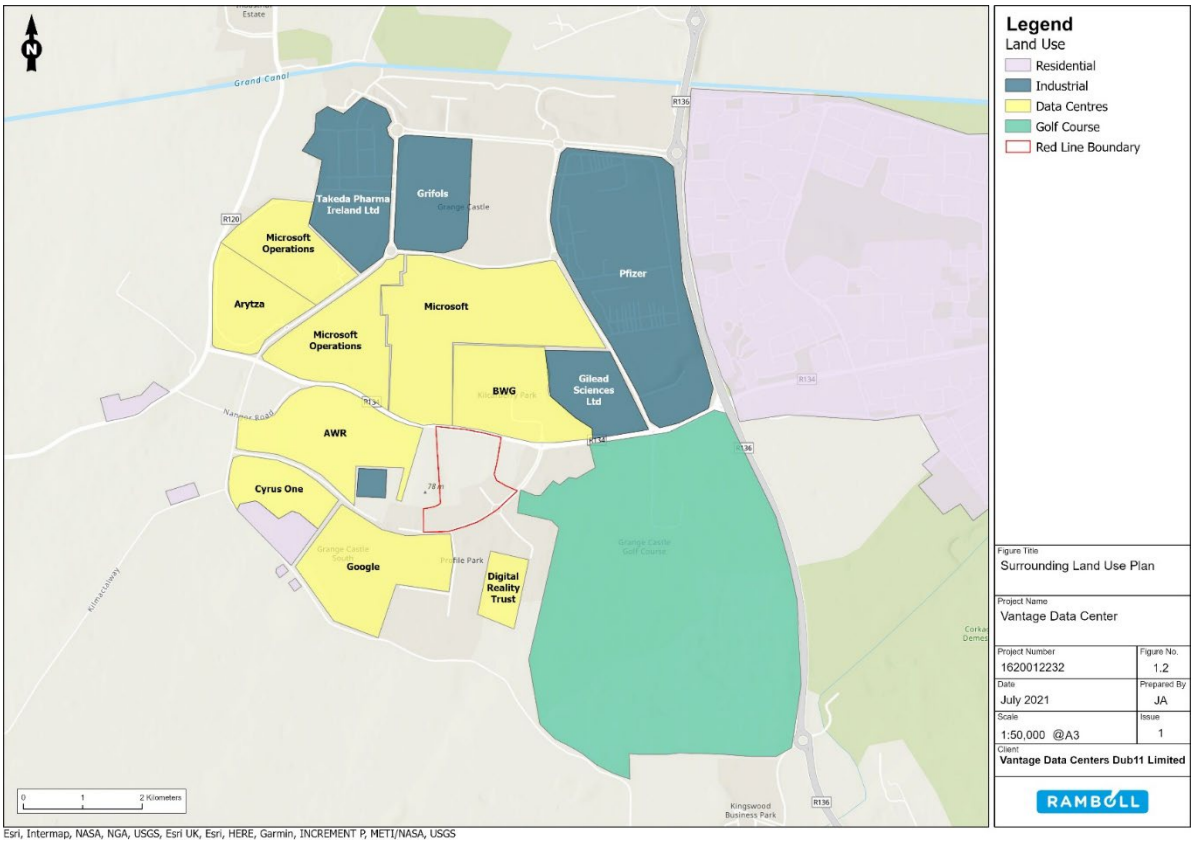



**Figure 2: Surrounding Land Uses Plan**

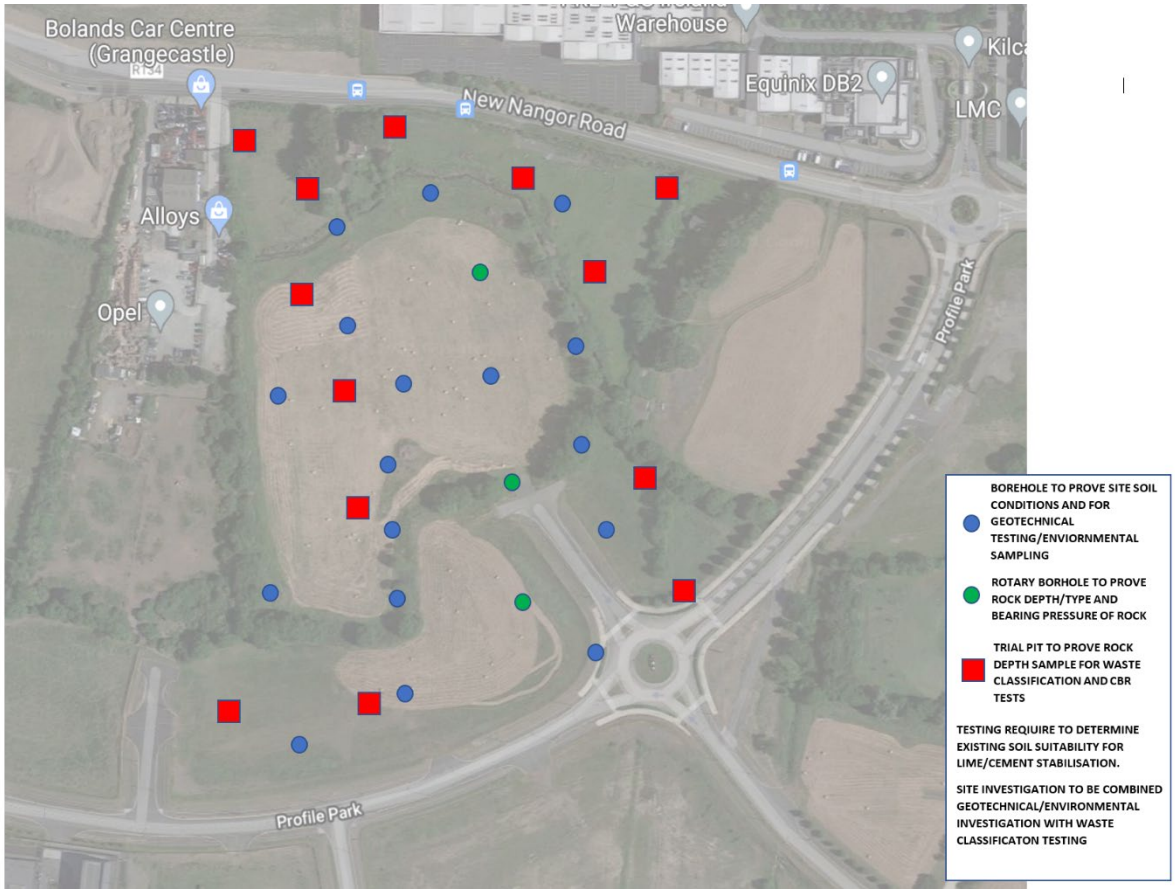

**Figure 3: Exploratory Hole Location Plan**

# APPENDIX 2
# GROUND INVESTIGATUON DESIGN SCOPE

**From:** James Mayer <james.m@iepinnacle.com>
**Sent:** 13 May 2021 21:06
**To:** paulquigley@igsl.ie
**Subject:** Profile Park, Grange Castle, Dublin

Hi Paul

We are looking at the above development for our client for an industrial project (refer site location plan below).




Refer attached for a site plan indicating trial pits, borehole and CBR test locations - could you provide us with a price and programme to undertake the site investigation works to include for the following:-

- 13 No trial Pits across the site as indicated on the attached plan
- 17 No boreholes ( with ground water installations)
- 3 No Rotary Boreholes
- CBR test Across the site (trial Pits)
- Allowance should be made for geotechnical testing to confirm bearing pressures across the site to support 2 storey industrial building (up to 4500KN column loads), identification of various strata and testing of soils for reuse within ground works across the site (lime/cement stabilisation is being considered), but also an understanding of their natural properties for reuse
- Logging of ground water across the site
- Environmental sampling of soil and ground water from across the site
- Waste Classification of soil across the site
- Allow for 4No. Infiltration tests (locations to be confirmed)
- Interpretive Geotechnical and Environmental Report

Please could you provide your budget quote and programme on or before Wednesday 20th May, could you also provide a programme for start on site, initial reporting (boreholes and trial pit logs) and timescales for final report based on your current commitments.

Should you have any comments or queries, please do not hesitate to contact us.

Regards

**James Mayer** MEng MIEI
Director

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# APPENDIX 3
# GENERIC QUANTITATIVE RISK ASSESSMENT SCREENING SHEETS

# Results - Leachate

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| **Client: IGSL** | | | | **Chemtest Job No.:** | | | | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quotation No.: Q20-21693 | | | | **Chemtest Sample ID.:** | | | | 1215872 | 1215874 | 1215876 | 1215878 | 1215880 | 1215881 | 1215883 | 1215884 | 1215885 | 1215886 | 1215887 | 1215889 | 1215891 |
| Order No.: | | | | Client Sample Ref.: | | | | AA143083 | AA143089 | AA143094 | AA143099 | AA148062 | AA148065 | AA148070 | AA148073 | AA148077 | AA148080 | AA148083 | AA158663 | AA148092 |
| | | | | Sample Location: | | | | TP1 | TP2 | TP3 | TP4 | TP5 | TP6 | TP7 | TP8 | TP9 | TP10 | TP11 | TP12 | TP13 |
| | | | | Sample Type: | | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | Top Depth (m): | | | | 0.30 | 0.50 | 0.50 | 0.50 | 1.00 | 0.50 | 0.50 | 0.50 | 0.60 | 0.50 | 0.40 | 0.10 | 0.50 |
| **Determinand** | **Accred.** | **SOP** | **Type** | **Units** | **LOD** | DWS | EQS | | | | | | | | | | | | | |
| pH | U | 1010 | 10:1 | | N/A | | | 8.5 | 8.4 | 8.5 | 8.5 | 8.7 | 8.4 | 8.5 | 8.6 | 8.6 | 8.7 | 8.1 | 8.4 | 8.5 |
| Ammonium | U | 1220 | 10:1 | mg/l | 0.050 | 0.5 | 0.6 | 0.10 | 0.067 | 0.057 | < 0.050 | < 0.050 | 0.11 | 0.063 | < 0.050 | 0.077 | 0.056 | 0.17 | 0.088 | 0.062 |
| Ammonium | N | 1220 | 10:1 | mg/kg | 0.10 | | | 1.2 | 0.76 | 0.68 | 0.40 | 0.64 | 1.2 | 0.75 | 0.51 | 0.95 | 0.72 | 1.8 | 1.0 | 0.72 |
| Boron (Dissolved) | U | 1455 | 10:1 | mg/kg | 0.01 | | | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo[j]fluoranthene | N | 1800 | 10:1 | µg/l | 0.010 | | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |

# Results - Soil

| Project: 23300 Project Appollo Grangecastle Dublin (Ramboll) | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Client: IGSL** | | | | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 | 21-19137 |
| Quotation No.: Q20-21693 | | | | 1215872 | 1215873 | 1215874 | 1215875 | 1215876 | 1215877 | 1215878 | 1215879 | 1215880 | 1215881 | 1215882 | 1215883 | 1215884 | 1215885 | 1215886 | 1215887 | 1215888 | 1215889 | 1215890 | 1215891 | 1215892 |
| Order No.: | | | | AA143083 | AA143085 | AA143089 | AA143090 | AA143094 | AA143096 | AA143099 | AA148061 | AA148062 | AA148065 | AA148066 | AA148070 | AA148073 | AA148077 | AA148080 | AA148083 | AA148085 | AA158663 | AA148088 | AA148092 | AA148093 |
| | | | | TP1 | TP1 | TP2 | TP2 | TP3 | TP3 | TP4 | TP5 | TP5 | TP6 | TP6 | TP7 | TP8 | TP9 | TP10 | TP11 | TP11 | TP12 | TP12 | TP13 | TP13 |
| | | | | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | | | | 0.30 | 0.50 | 0.50 | 1.00 | 0.50 | 1.00 | 0.50 | 1.00 | 1.00 | 0.50 | 0.60 | 0.50 | 0.50 | 0.60 | 0.50 | 0.40 | 1.00 | 0.10 | 0.50 | 0.50 | 1.00 |
| | | | | COVENTRY | | COVENTRY | | COVENTRY | | COVENTRY | | COVENTRY | COVENTRY | | COVENTRY | COVENTRY | COVENTRY | COVENTRY | COVENTRY | | COVENTRY | | COVENTRY | |
| **Determinand** | **Units** | **GAC commercial/ industrial** | **Maximum** | | | | | | | | | | | | | | | | | | | | | |
| ACM Type | | | | - | | - | | - | | - | | - | - | | - | - | - | - | - | | - | | - | |
| Asbestos Identification | | | | 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 | No Asbestos Detected | No Asbestos Detected | | No Asbestos Detected | | No Asbestos Detected | |
| Moisture | % | | 32 | 23 | 10 | 23 | 11 | 20 | 12 | 32 | 15 | 16 | 21 | 15 | 17 | 15 | 15 | 14 | 15 | 18 | 14 | 15 | 22 | 17 |
| pH (2.5:1) | | | 9.6 | | 8.9 | | 8.7 | | 8.8 | | 8.5 | | | 8.5 | | | | | | 9.4 | | 9.6 | | 9.5 |
| Boron (Hot Water Soluble) | mg/kg | 240000 | 0.65 | < 0.40 | | < 0.40 | | < 0.40 | | 0.65 | | < 0.40 | < 0.40 | | < 0.40 | < 0.40 | < 0.40 | < 0.40 | < 0.40 | | < 0.40 | | < 0.40 | |
| Magnesium (Water Soluble) | g/l | | 0 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | | < 0.010 | | | | | | < 0.010 | | < 0.010 | | < 0.010 |
| Sulphate (2:1 Water Soluble) as SO4 | g/l | | 0 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | | < 0.010 | | | | | | < 0.010 | | < 0.010 | | < 0.010 |
| Total Sulphur | % | | 0.17 | | 0.044 | | 0.038 | | 0.088 | | 0.17 | | | 0.021 | | | | | | 0.024 | | 0.02 | | 0.033 |
| Sulphur (Elemental) | mg/kg | | 5.9 | 4.1 | | 3.4 | | 3.4 | | 3.2 | | 2.9 | 3.3 | | 3.2 | < 1.0 | 1.1 | 5.9 | 2.6 | | 3.4 | | 4 | |
| Chloride (Water Soluble) | g/l | | 0 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | | < 0.010 | | | | | | < 0.010 | | < 0.010 | | < 0.010 |
| Nitrate (Water Soluble) | g/l | | 0.015 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | | < 0.010 | | | | | | < 0.010 | | 0.015 | | < 0.010 |
| Cyanide (Total) | mg/kg | 49 | 0 | < 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | | < 0.50 | < 0.50 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | | < 0.50 | | < 0.50 | |
| Sulphide (Easily Liberatable) | mg/kg | | 12 | 1.2 | | 2.7 | | 3.1 | | 1 | | 2.4 | 0.96 | | 12 | 3.2 | 2.1 | 1.1 | < 0.50 | | 1.7 | | 1.1 | |
| Ammonium (Water Soluble) | g/l | | 0 | | < 0.01 | | < 0.01 | | < 0.01 | | < 0.01 | | | < 0.01 | | | | | | < 0.01 | | < 0.01 | | < 0.01 |
| Sulphate (Acid Soluble) | % | | 0.076 | 0.076 | 0.04 | 0.073 | 0.031 | 0.065 | 0.02 | 0.076 | < 0.010 | < 0.010 | 0.036 | 0.029 | 0.022 | 0.035 | < 0.010 | 0.068 | 0.042 | < 0.010 | 0.024 | 0.011 | 0.016 | < 0.010 |
| Arsenic | mg/kg | 640 | 38 | 18 | | 38 | | 24 | | 11 | | 8 | 10 | | 15 | 16 | 13 | 16 | 25 | | 18 | | 17 | |
| Barium | mg/kg | 22000 | 600 | 100 | | 600 | | 290 | | 86 | | 13 | 89 | | 85 | 180 | 30 | 14 | 140 | | 50 | | 61 | |
| Cadmium | mg/kg | 210 | 4 | 3.4 | | 4 | | 3.1 | | 2.3 | | 0.85 | 1.8 | | 3 | 1.5 | 0.83 | 0.57 | 1.5 | | 1.4 | | 0.98 | |
| Chromium | mg/kg | 8600 | 31 | 25 | | 31 | | 17 | | 28 | | 5.9 | 14 | | 17 | 15 | 11 | 7.3 | 25 | | 11 | | 19 | |
| Molybdenum | mg/kg | 18000 | 8.9 | 5.7 | | 8.9 | | 7 | | < 2.0 | | 3.5 | 3 | | 4.9 | 4.7 | 4.1 | 3.4 | 5 | | 3.4 | | 2.6 | |
| Antimony | mg/kg | 7400 | 3.3 | 2.9 | | 2.2 | | 2.1 | | < 2.0 | | < 2.0 | < 2.0 | | 2.2 | < 2.0 | < 2.0 | 3.3 | 2.2 | | < 2.0 | | < 2.0 | |
| Copper | mg/kg | 68000 | 53 | 53 | | 28 | | 27 | | 24 | | 13 | 20 | | 34 | 20 | 24 | 13 | 16 | | 22 | | 15 | |
| Mercury | mg/kg | 1100 | 0.15 | 0.15 | | 0.14 | | 0.11 | | 0.12 | | < 0.10 | < 0.10 | | 0.13 | < 0.10 | < 0.10 | < 0.10 | 0.11 | | < 0.10 | | < 0.10 | |
| Nickel | mg/kg | 980 | 78 | 78 | | 67 | | 61 | | 31 | | 31 | 35 | | 62 | 49 | 52 | 25 | 31 | | 44 | | 26 | |
| Lead | mg/kg | 2300 | 44 | 39 | | 44 | | 41 | | 24 | | 8.9 | 21 | | 23 | 15 | 16 | 10 | 25 | | 19 | | 21 | |
| Selenium | mg/kg | 12000 | 1.4 | 1.4 | | 1.3 | | 0.43 | | 0.7 | | 0.41 | 0.49 | | 0.42 | < 0.20 | < 0.20 | 1.2 | 1.2 | | 0.24 | | 0.56 | |
| Zinc | mg/kg | 730000 | 140 | 140 | | 120 | | 93 | | 68 | | 26 | 75 | | 82 | 39 | 31 | 16 | 73 | | 38 | | 59 | |
| Chromium (Trivalent) | mg/kg | 8600 | 31 | 25 | | 31 | | 17 | | 28 | | 5.9 | 14 | | 17 | 15 | 11 | 7.3 | 25 | | 11 | | 19 | |
| Chromium (Hexavalent) | mg/kg | 49 | 0 | < 0.30 | | < 0.30 | | < 0.30 | | < 0.30 | | < 0.30 | < 0.30 | | < 0.30 | < 0.30 | < 0.30 | < 0.30 | < 0.30 | | < 0.30 | | < 0.30 | |
| Mineral Oil (TPH Calculation) | mg/kg | | 0 | < 10 | | < 10 | | < 10 | | < 10 | | < 10 | < 10 | | < 10 | < 10 | < 10 | < 10 | < 10 | | < 10 | | < 10 | |
| Aliphatic TPH >C5-C6 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aliphatic TPH >C6-C8 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aliphatic TPH >C8-C10 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aliphatic TPH >C10-C12 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aliphatic TPH >C12-C16 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aliphatic TPH >C16-C21 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aliphatic TPH >C21-C35 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aliphatic TPH >C35-C44 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Total Aliphatic Hydrocarbons | mg/kg | | 0 | < 5.0 | | < 5.0 | | < 5.0 | | < 5.0 | | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | [AC] < 5.0 | | < 5.0 | |
| Aromatic TPH >C5-C7 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aromatic TPH >C7-C8 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aromatic TPH >C8-C10 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aromatic TPH >C10-C12 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aromatic TPH >C12-C16 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aromatic TPH >C16-C21 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aromatic TPH >C21-C35 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Aromatic TPH >C35-C44 | mg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Total Aromatic Hydrocarbons | mg/kg | | 0 | < 5.0 | | < 5.0 | | < 5.0 | | < 5.0 | | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | [AC] < 5.0 | | < 5.0 | |
| Total Petroleum Hydrocarbons | mg/kg | | 0 | < 10 | | < 10 | | < 10 | | < 10 | | < 10 | < 10 | | < 10 | < 10 | < 10 | < 10 | < 10 | | [AC] < 10 | | < 10 | |
| Benzene | µg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Toluene | µg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Ethylbenzene | µg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| m & p-Xylene | µg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| o-Xylene | µg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Methyl Tert-Butyl Ether | µg/kg | | 0 | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | | < 1.0 | < 1.0 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | [AC] < 1.0 | | < 1.0 | |
| Naphthalene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Acenaphthylene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Acenaphthene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Fluorene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Phenanthrene | mg/kg | 22000 | 0.044 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | 0.044 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Anthracene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Fluoranthene | mg/kg | 23000 | 0.06 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | 0.059 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | 0.06 | | < 0.010 | |
| Pyrene | mg/kg | 54000 | 0.061 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | 0.061 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | 0.031 | | < 0.010 | |
| Benzoanthracene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Chrysene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Benzo[b]fluoranthene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Benzo[k]fluoranthene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Benzopyrene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Indeno(1,2,3-c,d)Pyrene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Dibenz(a,h)Anthracene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Benzo(g,h,i)perylene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Coronene | mg/kg | | 0 | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | | < 0.010 | < 0.010 | | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | | < 0.010 | | < 0.010 | |
| Total Of 17 PAH's | mg/kg | | 0 | < 0.20 | | < 0.20 | | < 0.20 | | < 0.20 | | < 0.20 | < 0.20 | | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | | < 0.20 | | < 0.20 | |
| PCB 28 | mg/kg | | 0 | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | < 0.0010 | | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | | [AC] < 0.0010 | | < 0.0010 | |
| PCB 52 | mg/kg | | 0 | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | < 0.0010 | | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | | [AC] < 0.0010 | | < 0.0010 | |
| PCB 90+101 | mg/kg | | 0 | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | < 0.0010 | | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | | [AC] < 0.0010 | | < 0.0010 | |
| PCB 118 | mg/kg | | 0 | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | < 0.0010 | | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | | [AC] < 0.0010 | | < 0.0010 | |
| PCB 153 | mg/kg | | 0 | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | < 0.0010 | | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | | [AC] < 0.0010 | | < 0.0010 | |
| PCB 138 | mg/kg | | 0 | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | < 0.0010 | | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | | [AC] < 0.0010 | | < 0.0010 | |
| PCB 180 | mg/kg | | 0 | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | < 0.0010 | | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | | [AC] < 0.0010 | | < 0.0010 | |
| Total PCBs (7 congeners) | mg/kg | | 0 | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | | < 0.0010 | < 0.0010 | | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | | [AC] < 0.0010 | | < 0.0010 | |
| Total Phenols | mg/kg | | 0 | < 0.10 | | < 0.10 | | < 0.10 | | < 0.10 | | < 0.10 | < 0.10 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | | < 0.10 | | < 0.10 | |

# Results - Water

| Project: Water Analysis | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Client: IGSL** | | | **Chemtest Job No.:** | | | | 21-21918 | 21-21918 | 21-21918 | 21-21918 | 21-21918 |
| Quotation No.: Q21-24299 | | | **Chemtest Sample ID.:** | | | | 1229332 | 1229333 | 1229334 | 1229335 | 1229336 |
| | | | Sample Location: | | | | WS1 | WS2 | RC 1 | RC 2 | RC 3 |
| | | | Sample Type: | | | | WATER | WATER | WATER | WATER | WATER |
| | | | Date Sampled: | | DWS | EQS | 21-Jun-2021 | 21-Jun-2021 | 21-Jun-2021 | 21-Jun-2021 | 21-Jun-2021 |
| **Determinand** | **Accred.** | **SOP** | **Units** | **LOD** | | | | | | | |
| pH | U | 1010 | | N/A | | | 7.5 | 8.1 | 8.0 | 7.9 | 8.1 |
| Cyanide (Total) | U | 1300 | mg/l | 0.050 | 0.05 | | 0.11 | 0.11 | 0.11 | 0.10 | 0.12 |
| Arsenic (Dissolved) | U | 1455 | µg/l | 0.20 | 10 | 25 | 1.5 | 0.87 | 0.63 | 0.50 | 1.7 |
| Cadmium (Dissolved) | U | 1455 | µg/l | 0.11 | 5 | 0.08-0.25 | < 0.11 | < 0.11 | < 0.11 | < 0.11 | < 0.11 |
| Chromium (Dissolved) | U | 1455 | µg/l | 0.50 | 50 | 30 | 3.4 | 6.1 | 7.2 | 8.3 | 6.8 |
| Copper (Dissolved) | U | 1455 | µg/l | 0.50 | 2000 | 30 | 4.1 | 4.6 | 2.5 | 1.8 | 0.97 |
| Mercury (Dissolved) | U | 1455 | µg/l | 0.05 | 1 | 1 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Nickel (Dissolved) | U | 1455 | µg/l | 0.50 | 20 | 4 (bio) | 5.9 | 3.8 | 4.8 | 4.2 | 3.2 |
| Lead (Dissolved) | U | 1455 | µg/l | 0.50 | 10 | 1.2 (bio) | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| Selenium (Dissolved) | U | 1455 | µg/l | 0.50 | | | < 0.50 | < 0.50 | 17 | 22 | 4.3 |
| Zinc (Dissolved) | U | 1455 | µg/l | 2.5 | 5000 | 100 | 6.2 | 3.8 | 6.7 | < 2.5 | < 2.5 |
| Total TPH >C6-C40 | U | 1670 | µg/l | 10 | 10 | 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Naphthalene | U | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthylene | U | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | U | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluorene | U | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Phenanthrene | U | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Anthracene | U | 1700 | µg/l | 0.10 | 10000 | 0.1 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Fluoranthene | U | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Pyrene | U | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]anthracene | U | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Chrysene | N | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[b]fluoranthene | U | 1700 | µg/l | 0.10 | 0.5 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[k]fluoranthene | U | 1700 | µg/l | 0.10 | 0.05 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[a]pyrene | U | 1700 | µg/l | 0.10 | 0.01 | | < 0.10 | < 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 | < 0.10 | < 0.10 |
| Dibenz(a,h)Anthracene | U | 1700 | µg/l | 0.10 | | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Benzo[g,h,i]perylene | U | 1700 | µg/l | 0.10 | 0.05 | | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Total Of 16 PAH's | N | 1700 | µg/l | 2.0 | | 0.2 | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| Total Phenols | U | 1920 | mg/l | 0.030 | | | < 0.030 | < 0.030 | < 0.030 | < 0.030 | < 0.030 |
| | | | | | | | | | | | |
| DWS | https://www.epa.ie/publications/compliance--enforcement/drinking-water/advice--guidance/european-communities-drinking-water-no-2-regulations-2007.php | | | | | | | | | | |
| EQS | https://www.legislation.gov.uk/eudr/2008/105/annex/I | | | | | | | | | | |
| | https://www.rte.ie/documents/news/2017/08/water-quality-in-ireland-2010-2015.pdf | | | | | | | | | | |
| | WFD EU legislation | | | | | | | | | | |

# APPENDIX 4
# HAZWASTEONLINE™ WASTE CLASSIFICATION

# Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

YL768-BC2LP-2JZQY

## Job name

Vantage Data Center

## Description/Comments

## Project

## Site

## Classified by

Name:
**Damian Watkins**
Date:
**05 Aug 2021 11:30 GMT**
Telephone:

Company:
**Ramboll Environ**

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

**HazWasteOnline™ Certification:** -

| Course | Date |
|---|---|
| Hazardous Waste Classification | - |

## Job summary

| # | Sample name | Depth [m] | Classification Result | Hazard properties | Page |
|---|---|---|---|---|---|
| 1 | TP1 | 0.3 | Non Hazardous | | 3 |
| 2 | TP1[2] | 0.5 | Non Hazardous | | 6 |
| 3 | TP2 | 0.5 | Non Hazardous | | 7 |
| 4 | TP2[2] | 1 | Non Hazardous | | 10 |
| 5 | TP3 | 0.5 | Non Hazardous | | 11 |
| 6 | TP3[2] | 1 | Non Hazardous | | 14 |
| 7 | TP4 | 0.5 | Non Hazardous | | 15 |
| 8 | TP5 | 1 | Non Hazardous | | 18 |
| 9 | TP5[2] | 1 | Non Hazardous | | 19 |
| 10 | TP6 | 0.5 | Non Hazardous | | 22 |
| 11 | TP6[2] | 0.6 | Non Hazardous | | 25 |
| 12 | TP7 | 0.5 | Non Hazardous | | 26 |
| 13 | TP8 | 0.5 | Non Hazardous | | 29 |
| 14 | TP9 | 0.6 | Non Hazardous | | 32 |
| 15 | TP10 | 0.5 | Non Hazardous | | 35 |
| 16 | TP11 | 0.4 | Non Hazardous | | 38 |
| 17 | TP11[2] | 1 | Non Hazardous | | 41 |
| 18 | TP12 | 0.1 | Non Hazardous | | 42 |
| 19 | TP12[2] | 0.5 | Non Hazardous | | 45 |
| 20 | TP13 | 0.5 | Non Hazardous | | 46 |

## Related documents

| # | Name | Description |
|---|---|---|
| 1 | Leeds soil waste | waste stream template used to create this Job |

## Report

Created by: Damian Watkins

Created date: 05 Aug 2021 11:30 GMT

## Classification of sample: TP1

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

## Sample details

Sample name:
**TP1**
Sample Depth:
**0.3 m**
Moisture content:
**23%**
(no correction)

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: 23% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2.9 mg/kg | 2.456 | 7.122 mg/kg | 0.000712 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 18 mg/kg | 1.32 | 23.766 mg/kg | 0.00238 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 100 mg/kg | 1.7 | 169.952 mg/kg | 0.017 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 3.4 mg/kg | 1.142 | 3.884 mg/kg | 0.000388 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 25 mg/kg | 1.462 | 36.539 mg/kg | 0.00365 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 53 mg/kg | 1.126 | 59.672 mg/kg | 0.00597 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 39 mg/kg | | 39 mg/kg | 0.0039 % | | |
| 10 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | 0.15 mg/kg | 1.353 | 0.203 mg/kg | 0.0000203 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 5.7 mg/kg | 1.5 | 8.551 mg/kg | 0.000855 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 78 mg/kg | 2.637 | 205.661 mg/kg | 0.0206 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 1.4 mg/kg | 1.405 | 1.967 mg/kg | 0.000197 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 140 mg/kg | 2.469 | 345.701 mg/kg | 0.0346 % | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 | mg/kg | 1.884 | 0.942 | mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 | mg/kg | | 0.1 | mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 19 | | anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 25 | | chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 28 | | fluorene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 30 | | naphthalene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 32 | | pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 33 | | coronene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 | mg/kg | | 10 | mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0915 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP1[2]

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

## Sample details

Sample name:
**TP1[2]**
Sample Depth:
**0.5 m**
Moisture content:
**10%**
(no correction)

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: 10% 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 | • | pH | | PH | | 8.9 pH | | 8.9 pH | 8.9 pH | | |
| | | | | | | | | Total: | 0% | | |

Key

| | |
|---|---|
| | User supplied data |
| • | Determinand defined or amended by HazWasteOnline (see Appendix A) |

## Classification of sample: TP2

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

## Sample details

Sample name:
**TP2**
Sample Depth:
**0.5 m**
Moisture content:
**23%**
(no correction)

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: 23% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2.2 mg/kg | 2.456 | 5.403 mg/kg | 0.00054 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 38 mg/kg | 1.32 | 50.172 mg/kg | 0.00502 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 600 mg/kg | 1.7 | 1019.71 mg/kg | 0.102 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 4 mg/kg | 1.142 | 4.569 mg/kg | 0.000457 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 31 mg/kg | 1.462 | 45.308 mg/kg | 0.00453 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 28 mg/kg | 1.126 | 31.525 mg/kg | 0.00315 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 44 mg/kg | | 44 mg/kg | 0.0044 % | | |
| 10 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | 0.14 mg/kg | 1.353 | 0.189 mg/kg | 0.0000189 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 8.9 mg/kg | 1.5 | 13.352 mg/kg | 0.00134 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 67 mg/kg | 2.637 | 176.658 mg/kg | 0.0177 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 1.3 mg/kg | 1.405 | 1.827 mg/kg | 0.000183 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 120 mg/kg | 2.469 | 296.316 mg/kg | 0.0296 % | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 | mg/kg | 1.884 | 0.942 | mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 | mg/kg | | 0.1 | mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 19 | | anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 25 | | chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 28 | | fluorene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 30 | | naphthalene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 32 | | pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 33 | | coronene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 | mg/kg | | 10 | mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | | | |
| | | | | | | | | | | Total: | 0.17 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP2[2]

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

## Sample details

Sample name:
**TP2[2]**
Sample Depth:
**1 m**
Moisture content:
**11%**
(no correction)

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: 11% 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 | ● | pH | | PH | | 8.7 pH | | 8.7 pH | 8.7 pH | | |
| | | | | | | | | Total: | 0% | | |

Key

| | |
|---|---|
| | User supplied data |
| ● | Determinand defined or amended by HazWasteOnline (see Appendix A) |

## Classification of sample: TP3

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

## Sample details

Sample name:
**TP3**
Sample Depth:
**0.5 m**
Moisture content:
**20%**
(no correction)

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: 20% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2.1 mg/kg | 2.456 | 5.157 mg/kg | 0.000516 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 24 mg/kg | 1.32 | 31.688 mg/kg | 0.00317 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 290 mg/kg | 1.7 | 492.86 mg/kg | 0.0493 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 3.1 mg/kg | 1.142 | 3.541 mg/kg | 0.000354 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 17 mg/kg | 1.462 | 24.846 mg/kg | 0.00248 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 27 mg/kg | 1.126 | 30.399 mg/kg | 0.00304 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 41 mg/kg | | 41 mg/kg | 0.0041 % | | |
| 10 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | 0.11 mg/kg | 1.353 | 0.149 mg/kg | 0.0000149 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 7 mg/kg | 1.5 | 10.501 mg/kg | 0.00105 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 61 mg/kg | 2.637 | 160.838 mg/kg | 0.0161 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 0.43 mg/kg | 1.405 | 0.604 mg/kg | 0.0000604 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 93 mg/kg | 2.469 | 229.645 mg/kg | 0.023 % | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 | mg/kg | 1.884 | 0.942 | mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 | mg/kg | | 0.1 | mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 19 | | anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 25 | | chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 28 | | fluorene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 30 | | naphthalene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 32 | | pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 33 | | coronene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 | mg/kg | | 10 | mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | | | |
| | | | | | | | | | | Total: | 0.104 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP3[2]

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

## Sample details

Sample name:
**TP3[2]**
Sample Depth:
**1 m**
Moisture content:
**12%**
(no correction)

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: 12% 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 | ● | pH | | PH | | 8.8 pH | | 8.8 pH | 8.8 pH | | |
| | | | | | | | | Total: | 0% | | |

Key

| | |
|---|---|
| | User supplied data |
| ● | Determinand defined or amended by HazWasteOnline (see Appendix A) |

## Classification of sample: TP4

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

## Sample details

Sample name:
**TP4**
Sample Depth:
**0.5 m**
Moisture content:
**32%**
(no correction)

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: 32% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2 mg/kg | 2.456 | 4.912 mg/kg | 0.000491 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 11 mg/kg | 1.32 | 14.524 mg/kg | 0.00145 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 86 mg/kg | 1.7 | 146.158 mg/kg | 0.0146 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.65 mg/kg | 3.22 | 2.093 mg/kg | 0.000209 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 2.3 mg/kg | 1.142 | 2.627 mg/kg | 0.000263 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 28 mg/kg | 1.462 | 40.924 mg/kg | 0.00409 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 24 mg/kg | 1.126 | 27.021 mg/kg | 0.0027 % | | |
| 9 | 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 % | | |
| 10 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | 0.12 mg/kg | 1.353 | 0.162 mg/kg | 0.0000162 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 2 mg/kg | 1.5 | 3 mg/kg | 0.0003 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 31 mg/kg | 2.637 | 81.737 mg/kg | 0.00817 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 0.7 mg/kg | 1.405 | 0.983 mg/kg | 0.0000983 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 68 mg/kg | 2.469 | 167.912 mg/kg | 0.0168 % | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 | mg/kg | 1.884 | 0.942 | mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 | mg/kg | | 0.1 | mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 19 | | anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 25 | | chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 28 | | fluorene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 30 | | naphthalene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 32 | | pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 33 | | coronene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 | mg/kg | | 10 | mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0528 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP5

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

## Sample details

Sample name:
**TP5**
Sample Depth:
**1 m**
Moisture content:
**15%**
(no correction)

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: 15% 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 | ● | pH | | PH | | 8.5 pH | | 8.5 pH | 8.5 pH | | |
| | | | | | | | | Total: | 0% | | |

Key

| | |
|---|---|
| | User supplied data |
| ● | Determinand defined or amended by HazWasteOnline (see Appendix A) |

## Classification of sample: TP5[2]

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

## Sample details

Sample name:
**TP5[2]**
Sample Depth:
**1 m**
Moisture content:
**16%**
(no correction)

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: 16% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2 | mg/kg | 2.456 | 4.912 | mg/kg | 0.000491 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 8 | mg/kg | 1.32 | 10.563 | mg/kg | 0.00106 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 13 | mg/kg | 1.7 | 22.094 | mg/kg | 0.00221 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 | mg/kg | 3.22 | 1.288 | mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 0.85 | mg/kg | 1.142 | 0.971 | mg/kg | 0.0000971 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 5.9 | mg/kg | 1.462 | 8.623 | mg/kg | 0.000862 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 | mg/kg | | 0.5 | mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 13 | mg/kg | 1.126 | 14.637 | mg/kg | 0.00146 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 8.9 | mg/kg | | 8.9 | mg/kg | 0.00089 % | | |
| 10 | 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 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 3.5 | mg/kg | 1.5 | 5.251 | mg/kg | 0.000525 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 31 | mg/kg | 2.637 | 81.737 | mg/kg | 0.00817 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 0.41 | mg/kg | 1.405 | 0.576 | mg/kg | 0.0000576 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 26 | mg/kg | 2.469 | 64.202 | mg/kg | 0.00642 % | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 | mg/kg | 1.884 | 0.942 | mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 | mg/kg | | 0.1 | mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 19 | | anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 25 | | chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 28 | | fluorene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 30 | | naphthalene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 32 | | pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 33 | | coronene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 | mg/kg | | 10 | mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0236 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP6

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

## Sample details

Sample name:
**TP6**
Sample Depth:
**0.5 m**
Moisture content:
**21%**
(no correction)

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: 21% 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 | | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2 | mg/kg | 2.456 | 4.912 | mg/kg | 0.000491 % | | |
| 2 | | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 10 | mg/kg | 1.32 | 13.203 | mg/kg | 0.00132 % | | |
| 3 | | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 89 | mg/kg | 1.7 | 151.257 | mg/kg | 0.0151 % | | |
| 4 | | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 | mg/kg | 3.22 | 1.288 | mg/kg | 0.000129 % | | |
| 5 | | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 1.8 | mg/kg | 1.142 | 2.056 | mg/kg | 0.000206 % | | |
| 6 | | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 14 | mg/kg | 1.462 | 20.462 | mg/kg | 0.00205 % | | |
| 7 | | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 | mg/kg | | 0.5 | mg/kg | 0.00005 % | | |
| 8 | | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 20 | mg/kg | 1.126 | 22.518 | mg/kg | 0.00225 % | | |
| 9 | | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 21 | mg/kg | | 21 | mg/kg | 0.0021 % | | |
| 10 | | 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 % | | |
| 11 | | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 3 | mg/kg | 1.5 | 4.501 | mg/kg | 0.00045 % | | |
| 12 | | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 35 | mg/kg | 2.637 | 92.284 | mg/kg | 0.00923 % | | |
| 13 | | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 0.49 | mg/kg | 1.405 | 0.688 | mg/kg | 0.0000688 % | | |
| 14 | | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 75 | mg/kg | 2.469 | 185.197 | mg/kg | 0.0185 % | | |

| # | | Determinand | | | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 mg/kg | 1.884 | 0.942 mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 mg/kg | | 0.1 mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | |
| 19 | | anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | |
| 25 | | chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | |
| 27 | | fluoranthene | | | | 0.059 mg/kg | | 0.059 mg/kg | 0.0000059 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | |
| 28 | | fluorene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | |
| 30 | | naphthalene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | |
| 31 | | phenanthrene | | | | 0.044 mg/kg | | 0.044 mg/kg | 0.0000044 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | |
| 32 | | pyrene | | | | 0.061 mg/kg | | 0.061 mg/kg | 0.0000061 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | |
| 33 | | coronene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 mg/kg | | 10 mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | |
| | | | | | | | | Total: | 0.0531 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP6[2]

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

## Sample details

Sample name:
**TP6[2]**
Sample Depth:
**0.6 m**
Moisture content:
**15%**
(no correction)

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: 15% 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 | • | pH | | PH | | 8.5 pH | | 8.5 pH | 8.5 pH | | |
| | | | | | | | | Total: | 0% | | |

Key

User supplied data
• Determinand defined or amended by HazWasteOnline (see Appendix A)

## Classification of sample: TP7

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

## Sample details

Sample name:
**TP7**
Sample Depth:
**0.5 m**
Moisture content:
**17%**
(no correction)

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: 17% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2.2 mg/kg | 2.456 | 5.403 mg/kg | 0.00054 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 15 mg/kg | 1.32 | 19.805 mg/kg | 0.00198 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 85 mg/kg | 1.7 | 144.459 mg/kg | 0.0144 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 3 mg/kg | 1.142 | 3.427 mg/kg | 0.000343 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 17 mg/kg | 1.462 | 24.846 mg/kg | 0.00248 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 34 mg/kg | 1.126 | 38.28 mg/kg | 0.00383 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 23 mg/kg | | 23 mg/kg | 0.0023 % | | |
| 10 | 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 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 4.9 mg/kg | 1.5 | 7.351 mg/kg | 0.000735 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 62 mg/kg | 2.637 | 163.474 mg/kg | 0.0163 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 0.42 mg/kg | 1.405 | 0.59 mg/kg | 0.000059 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 82 mg/kg | 2.469 | 202.482 mg/kg | 0.0202 % | | |

| # | | Determinand | | | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 mg/kg | 1.884 | 0.942 mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 mg/kg | | 0.1 mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | |
| 19 | | anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | |
| 25 | | chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | |
| 28 | | fluorene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | |
| 30 | | naphthalene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | |
| 32 | | pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | |
| 33 | | coronene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 mg/kg | | 10 mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | |
| | | | | | | | | Total: | 0.0646 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP8

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

## Sample details

Sample name:
**TP8**
Sample Depth:
**0.5 m**
Moisture content:
**15%**
(no correction)

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: 15% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2 mg/kg | 2.456 | 4.912 mg/kg | 0.000491 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 16 mg/kg | 1.32 | 21.125 mg/kg | 0.00211 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 180 mg/kg | 1.7 | 305.913 mg/kg | 0.0306 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 1.5 mg/kg | 1.142 | 1.713 mg/kg | 0.000171 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 15 mg/kg | 1.462 | 21.923 mg/kg | 0.00219 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 20 mg/kg | 1.126 | 22.518 mg/kg | 0.00225 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 15 mg/kg | | 15 mg/kg | 0.0015 % | | |
| 10 | 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 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 4.7 mg/kg | 1.5 | 7.051 mg/kg | 0.000705 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 49 mg/kg | 2.637 | 129.198 mg/kg | 0.0129 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 0.2 mg/kg | 1.405 | 0.281 mg/kg | 0.0000281 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 39 mg/kg | 2.469 | 96.303 mg/kg | 0.00963 % | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 | mg/kg | 1.884 | 0.942 | mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 | mg/kg | | 0.1 | mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 19 | | anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 25 | | chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 28 | | fluorene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 30 | | naphthalene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 32 | | pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 33 | | coronene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 | mg/kg | | 10 | mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0639 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP9

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

## Sample details

Sample name:
**TP9**
Sample Depth:
**0.6 m**
Moisture content:
**15%**
(no correction)

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: 15% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2 mg/kg | 2.456 | 4.912 mg/kg | 0.000491 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 13 mg/kg | 1.32 | 17.164 mg/kg | 0.00172 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 30 mg/kg | 1.7 | 50.986 mg/kg | 0.0051 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 0.83 mg/kg | 1.142 | 0.948 mg/kg | 0.0000948 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 11 mg/kg | 1.462 | 16.077 mg/kg | 0.00161 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 24 mg/kg | 1.126 | 27.021 mg/kg | 0.0027 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 16 mg/kg | | 16 mg/kg | 0.0016 % | | |
| 10 | 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 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 4.1 mg/kg | 1.5 | 6.151 mg/kg | 0.000615 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 52 mg/kg | 2.637 | 137.108 mg/kg | 0.0137 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 0.2 mg/kg | 1.405 | 0.281 mg/kg | 0.0000281 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 31 mg/kg | 2.469 | 76.548 mg/kg | 0.00765 % | | |

| # | | Determinand | | | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 mg/kg | 1.884 | 0.942 mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 mg/kg | | 0.1 mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | |
| 19 | | anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | |
| 25 | | chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | |
| 28 | | fluorene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | |
| 30 | | naphthalene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | |
| 32 | | pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | |
| 33 | | coronene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 mg/kg | | 10 mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | |
| | | | | | | | | Total: | 0.0366 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP10

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

## Sample details

Sample name:
**TP10**
Sample Depth:
**0.5 m**
Moisture content:
**14%**
(no correction)

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: 14% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 3.3 mg/kg | 2.456 | 8.104 mg/kg | 0.00081 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 16 mg/kg | 1.32 | 21.125 mg/kg | 0.00211 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 14 mg/kg | 1.7 | 23.793 mg/kg | 0.00238 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 0.57 mg/kg | 1.142 | 0.651 mg/kg | 0.0000651 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 7.3 mg/kg | 1.462 | 10.669 mg/kg | 0.00107 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 13 mg/kg | 1.126 | 14.637 mg/kg | 0.00146 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 10 mg/kg | | 10 mg/kg | 0.001 % | | |
| 10 | 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 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 3.4 mg/kg | 1.5 | 5.101 mg/kg | 0.00051 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 25 mg/kg | 2.637 | 65.917 mg/kg | 0.00659 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 1.2 mg/kg | 1.405 | 1.686 mg/kg | 0.000169 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 16 mg/kg | 2.469 | 39.509 mg/kg | 0.00395 % | | |

| # | | Determinand | | | CLP Note | User entered data | | Conv. Factor | Compound conc. | | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 | mg/kg | 1.884 | 0.942 | mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 | mg/kg | | 0.1 | mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | | | |
| 19 | | anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | | | |
| 25 | | chrysene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | | | |
| 28 | | fluorene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | | | |
| 30 | | naphthalene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | | | |
| 32 | | pyrene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | | | |
| 33 | | coronene | | | | 0.01 | mg/kg | | 0.01 | mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 | mg/kg | | 10 | mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | | | |
| | | | | | | | | | | Total: | 0.0214 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP11

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

## Sample details

Sample name:
**TP11**
Sample Depth:
**0.4 m**
Moisture content:
**15%**
(no correction)

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: 15% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2.2 mg/kg | 2.456 | 5.403 mg/kg | 0.00054 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 25 mg/kg | 1.32 | 33.008 mg/kg | 0.0033 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 140 mg/kg | 1.7 | 237.932 mg/kg | 0.0238 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 1.5 mg/kg | 1.142 | 1.713 mg/kg | 0.000171 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 25 mg/kg | 1.462 | 36.539 mg/kg | 0.00365 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 16 mg/kg | 1.126 | 18.014 mg/kg | 0.0018 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 25 mg/kg | | 25 mg/kg | 0.0025 % | | |
| 10 | mercury { mercury dichloride } | 080-010-00-X | 231-299-8 | 7487-94-7 | | 0.11 mg/kg | 1.353 | 0.149 mg/kg | 0.0000149 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 5 mg/kg | 1.5 | 7.501 mg/kg | 0.00075 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 31 mg/kg | 2.637 | 81.737 mg/kg | 0.00817 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 1.2 mg/kg | 1.405 | 1.686 mg/kg | 0.000169 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 73 mg/kg | 2.469 | 180.259 mg/kg | 0.018 % | | |

| # | | Determinand | | | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 mg/kg | 1.884 | 0.942 mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 mg/kg | | 0.1 mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | |
| 19 | | anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | |
| 25 | | chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | |
| 28 | | fluorene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | |
| 30 | | naphthalene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | |
| 32 | | pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | |
| 33 | | coronene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 mg/kg | | 10 mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | |
| | | | | | | | | Total: | 0.0642 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP11[2]

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

## Sample details

Sample name:
**TP11[2]**
Sample Depth:
**1 m**
Moisture content:
**18%**
(no correction)

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: 18% 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 | | pH | | PH | | 9.4 pH | | 9.4 pH | 9.4 pH | | |
| | | | | | | | | Total: | 0% | | |

Key

| | |
|---|---|
| | User supplied data |
| | Determinand defined or amended by HazWasteOnline (see Appendix A) |

## Classification of sample: TP12

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

## Sample details

Sample name:
**TP12**
Sample Depth:
**0.1 m**
Moisture content:
**14%**
(no correction)

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: 14% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2 mg/kg | 2.456 | 4.912 mg/kg | 0.000491 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 18 mg/kg | 1.32 | 23.766 mg/kg | 0.00238 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 50 mg/kg | 1.7 | 84.976 mg/kg | 0.0085 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 1.4 mg/kg | 1.142 | 1.599 mg/kg | 0.00016 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 11 mg/kg | 1.462 | 16.077 mg/kg | 0.00161 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | 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 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 19 mg/kg | | 19 mg/kg | 0.0019 % | | |
| 10 | 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 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 3.4 mg/kg | 1.5 | 5.101 mg/kg | 0.00051 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 44 mg/kg | 2.637 | 116.014 mg/kg | 0.0116 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 0.24 mg/kg | 1.405 | 0.337 mg/kg | 0.0000337 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 38 mg/kg | 2.469 | 93.833 mg/kg | 0.00938 % | | |

| # | | Determinand | | | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 mg/kg | 1.884 | 0.942 mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 mg/kg | | 0.1 mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | |
| 19 | | anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | |
| 25 | | chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | |
| 27 | | fluoranthene | | | | 0.06 mg/kg | | 0.06 mg/kg | 0.000006 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | |
| 28 | | fluorene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | |
| 30 | | naphthalene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | |
| 32 | | pyrene | | | | 0.031 mg/kg | | 0.031 mg/kg | 0.0000031 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | |
| 33 | | coronene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 mg/kg | | 10 mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | |
| | | | | | | | | Total: | 0.0404 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Classification of sample: TP12[2]

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

## Sample details

Sample name:
**TP12[2]**
Sample Depth:
**0.5 m**
Moisture content:
**15%**
(no correction)

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: 15% 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 | ● | pH | | | | 9.6 pH | | 9.6 pH | 9.6 pH | | |
| | | | | PH | | | | | | | |
| | | | | | | | | Total: | 0% | | |

Key

| | |
|---|---|
| | User supplied data |
| ● | Determinand defined or amended by HazWasteOnline (see Appendix A) |

## Classification of sample: TP13

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

## Sample details

Sample name:
**TP13**
Sample Depth:
**0.5 m**
Moisture content:
**22%**
(no correction)

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: 22% 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 | antimony { antimony pentachloride } | 051-002-00-3 | 231-601-8 | 7647-18-9 | | 2 mg/kg | 2.456 | 4.912 mg/kg | 0.000491 % | | |
| 2 | arsenic { arsenic trioxide } | 033-003-00-0 | 215-481-4 | 1327-53-3 | | 17 mg/kg | 1.32 | 22.446 mg/kg | 0.00224 % | | |
| 3 | barium { barium sulfate } | | 231-784-4 | 7727-43-7 | | 61 mg/kg | 1.7 | 103.671 mg/kg | 0.0104 % | | |
| 4 | boron { diboron trioxide; boric oxide } | 005-008-00-8 | 215-125-8 | 1303-86-2 | | 0.4 mg/kg | 3.22 | 1.288 mg/kg | 0.000129 % | | |
| 5 | cadmium { cadmium oxide } | 048-002-00-0 | 215-146-2 | 1306-19-0 | | 0.98 mg/kg | 1.142 | 1.119 mg/kg | 0.000112 % | | |
| 6 | chromium in chromium(III) compounds { chromium(III) oxide (worst case) } | | 215-160-9 | 1308-38-9 | | 19 mg/kg | 1.462 | 27.77 mg/kg | 0.00278 % | | |
| 7 | chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex | 024-017-00-8 | | | | 0.5 mg/kg | | 0.5 mg/kg | 0.00005 % | | |
| 8 | copper { dicopper oxide; copper (I) oxide } | 029-002-00-X | 215-270-7 | 1317-39-1 | | 15 mg/kg | 1.126 | 16.888 mg/kg | 0.00169 % | | |
| 9 | lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) } | 082-001-00-6 | | | 1 | 21 mg/kg | | 21 mg/kg | 0.0021 % | | |
| 10 | 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 % | | |
| 11 | molybdenum { molybdenum(VI) oxide } | 042-001-00-9 | 215-204-7 | 1313-27-5 | | 2.6 mg/kg | 1.5 | 3.9 mg/kg | 0.00039 % | | |
| 12 | nickel { nickel sulfate } | 028-009-00-5 | 232-104-9 | 7786-81-4 | | 26 mg/kg | 2.637 | 68.554 mg/kg | 0.00686 % | | |
| 13 | selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } | 034-002-00-8 | | | | 0.56 mg/kg | 1.405 | 0.787 mg/kg | 0.0000787 % | | |
| 14 | zinc { zinc sulphate } | 030-006-00-9 | 231-793-3 [1]<br>231-793-3 [2] | 7446-19-7 [1]<br>7733-02-0 [2] | | 59 mg/kg | 2.469 | 145.688 mg/kg | 0.0146 % | | |

| # | | Determinand | | | CLP Note | User entered data | Conv. Factor | Compound conc. | Classification value | MC Applied | Conc. Not Used |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLP index number | EC Number | CAS Number | | | | | | | |
| 15 | | cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } | | | | 0.5 mg/kg | 1.884 | 0.942 mg/kg | 0.0000942 % | | |
| | | 006-007-00-5 | | | | | | | | | |
| 16 | | monohydric phenols | | | | 0.1 mg/kg | | 0.1 mg/kg | 0.00001 % | | |
| | | | | P1186 | | | | | | | |
| 17 | | acenaphthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-469-6 | 83-32-9 | | | | | | | |
| 18 | | acenaphthylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-917-1 | 208-96-8 | | | | | | | |
| 19 | | anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-371-1 | 120-12-7 | | | | | | | |
| 20 | | benzo[a]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-033-00-9 | 200-280-6 | 56-55-3 | | | | | | | |
| 21 | | benzo[a]pyrene; benzo[def]chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-032-00-3 | 200-028-5 | 50-32-8 | | | | | | | |
| 22 | | benzo[b]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-034-00-4 | 205-911-9 | 205-99-2 | | | | | | | |
| 23 | | benzo[ghi]perylene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-883-8 | 191-24-2 | | | | | | | |
| 24 | | benzo[k]fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-036-00-5 | 205-916-6 | 207-08-9 | | | | | | | |
| 25 | | chrysene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-048-00-0 | 205-923-4 | 218-01-9 | | | | | | | |
| 26 | | dibenz[a,h]anthracene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-041-00-2 | 200-181-8 | 53-70-3 | | | | | | | |
| 27 | | fluoranthene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-912-4 | 206-44-0 | | | | | | | |
| 28 | | fluorene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-695-5 | 86-73-7 | | | | | | | |
| 29 | | indeno[123-cd]pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-893-2 | 193-39-5 | | | | | | | |
| 30 | | naphthalene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | 601-052-00-2 | 202-049-5 | 91-20-3 | | | | | | | |
| 31 | | phenanthrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 201-581-5 | 85-01-8 | | | | | | | |
| 32 | | pyrene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 204-927-3 | 129-00-0 | | | | | | | |
| 33 | | coronene | | | | 0.01 mg/kg | | 0.01 mg/kg | 0.000001 % | | |
| | | | 205-881-7 | 191-07-1 | | | | | | | |
| 34 | | TPH (C6 to C40) petroleum group | | | | 10 mg/kg | | 10 mg/kg | 0.001 % | | |
| | | | | TPH | | | | | | | |
| | | | | | | | | Total: | 0.043 % | | |

Key

| | |
|---|---|
| | User supplied data |
| | 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 |
| CLP: Note 1 | Only the metal concentration has been used for classification |

## Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Soil samples and results below lower detection

Hazard Statements hit:

**Flam. Liq. 3; H226** "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.001%)

## Appendix A: Classifier defined and non CLP determinands

**barium sulfate** (EC Number: 231-784-4, CAS Number: 7727-43-7)

Description/Comments: No hazard statements
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/89983 Sigma Aldrich SDS dated 15/4/19
Data source date: 02 Apr 2020
Hazard Statements: None.

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

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
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

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

CLP index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s):
03 Jun 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

**salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

**monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Acute Tox. 3 H301 , Acute Tox. 3 H311 , Acute Tox. 3 H331 , Skin Corr. 1B H314 >= 3 %, Skin Irrit. 2 H315 1 £ conc. < 3 %, Eye Irrit. 2 H319 1 £ conc. < 3 %, Muta. 2 H341 , STOT RE 2 H373 , Aquatic Chronic 2 H411

**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 Jul 2015
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

**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 Jul 2015
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

**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 Jul 2015
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

**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 Jul 2015
Hazard Statements: 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 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

**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 Aug 2015
Hazard Statements: 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 Aug 2015
Hazard Statements: Carc. 2 H351

**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 Aug 2015
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

**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 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

**coronene** (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source: http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2 H371

**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 May 2015
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

**pH** (CAS Number: PH)

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

## Appendix B: Rationale for selection of metal species

**antimony {antimony pentachloride}**

conservative assumption

**arsenic {arsenic trioxide}**

Worst case species

**barium {barium sulfate}**

**boron {diboron trioxide; boric oxide}**

**cadmium {cadmium oxide}**

Potential species in soil

**chromium in chromium(III) compounds {chromium(III) oxide (worst case)}**

Worst case species

**copper {dicopper oxide; copper (I) oxide}**

Potential species in soil

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

**mercury {mercury dichloride}**

Worst case species

**molybdenum {molybdenum(VI) oxide}**

only species available

**nickel {nickel sulfate}**

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

Worst case species

**zinc {zinc sulphate}**

conservative species

**cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}**

conservatively assumption

## Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2021.197.4823.9172 (16 Jul 2021)
HazWasteOnline Database: 2021.197.4823.9172 (16 Jul 2021)

This classification utilises the following guidance and legislation:
**WM3 v1.1 - Waste Classification** - 1st Edition v1.1 - May 2018
**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 Waste 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
**HP14 amendment** - Regulation (EU) 2017/997 of 8 June 2017
**13th ATP** - Regulation (EU) 2018/1480 of 4 October 2018
**14th ATP** - Regulation (EU) 2020/217 of 4 October 2019
**15th ATP** - Regulation (EU) 2020/1182 of 19 May 2020
**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2019** - UK: 2019 No. 720 of 27th March 2019
**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020** - UK: 2020 No. 1567 of 16th December 2020
**The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020** - UK: 2020 No. 1540 of 16th December 2020
**POPs Regulation 2019** - Regulation (EU) 2019/1021 of 20 June 2019

# APPENDIX 5
# WASTE ACCEPTANCE CRITERIA (WAC) TESTING

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215872 | | | | | | |
| **Sample Ref:** | AA143083 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP1 | | | | | | |
| **Top Depth(m):** | 0.30 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 1.6 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 6.3 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.1 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.0020 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | 0.0005 | 0.0049 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | 0.0005 | 0.0050 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0027 | 0.027 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0012 | 0.012 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | 0.0013 | 0.013 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.36 | 3.6 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 91 | 900 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 4.7 | < 50 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 23 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215874 | | | | | | |
| **Sample Ref:** | AA143089 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP2 | | | | | | |
| **Top Depth(m):** | 0.50 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 0.84 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 5.5 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.2 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.013 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | 0.0003 | 0.0033 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0021 | 0.021 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0010 | 0.0099 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | 0.0009 | 0.0086 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.32 | 3.2 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 91 | 900 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 6.9 | 69 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 23 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215876 | | | | | | |
| **Sample Ref:** | AA143094 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP3 | | | | | | |
| **Top Depth(m):** | 0.50 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 1.2 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.8 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.6 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.039 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | 0.0002 | 0.0023 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | 0.0005 | 0.0054 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0009 | 0.0092 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0069 | 0.069 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | < 0.0005 | < 0.0005 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.53 | 5.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 72 | 710 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 4.8 | < 50 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 20 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215878 | | | | | | |
| **Sample Ref:** | AA143099 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP4 | | | | | | |
| **Top Depth(m):** | 0.50 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 1.6 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 6.9 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.4 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.0090 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | 0.0008 | 0.0078 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | 0.0007 | 0.0072 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0021 | 0.021 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0011 | 0.011 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | 0.0006 | 0.0063 | 0.4 | 10 | 40 |
| Lead | 1455 | U | 0.0007 | 0.0073 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | 0.0011 | 0.011 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | 1.2 | 12 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.33 | 3.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 65 | 640 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 14 | 140 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 32 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215880 | | | | | | |
| **Sample Ref:** | AA148062 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP5 | | | | | | |
| **Top Depth(m):** | 1.00 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 0.29 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 2.7 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.5 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.074 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | < 0.0002 | < 0.0002 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 70 |
| Copper | 1455 | U | < 0.0005 | < 0.0005 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0042 | 0.042 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | < 0.0005 | < 0.0005 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.51 | 5.1 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 55 | 540 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 8.8 | 88 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 16 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215881 | | | | | | |
| **Sample Ref:** | AA148065 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP6 | | | | | | |
| **Top Depth(m):** | 0.50 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 1.1 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 4.6 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.0 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.010 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | 0.0004 | 0.0035 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | 0.0006 | 0.0057 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0028 | 0.028 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0018 | 0.018 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | 0.0011 | 0.011 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.28 | 2.8 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 120 | 1200 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 7.1 | 71 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 21 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215883 | | | | | | |
| **Sample Ref:** | AA148070 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP7 | | | | | | |
| **Top Depth(m):** | 0.50 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 0.42 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 3.4 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.5 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.016 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | < 0.0002 | < 0.0002 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 70 |
| Copper | 1455 | U | < 0.0005 | < 0.0005 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0041 | 0.041 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | < 0.0005 | < 0.0005 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.33 | 3.3 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 65 | 650 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 3.5 | < 50 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 17 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215884 | | | | | | |
| **Sample Ref:** | AA148073 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP8 | | | | | | |
| **Top Depth(m):** | 0.50 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 0.68 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 13 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 9.3 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.042 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | < 0.0002 | < 0.0002 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0007 | 0.0073 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0065 | 0.065 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | < 0.0005 | < 0.0005 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.47 | 4.7 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 72 | 710 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 5.8 | 58 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 15 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215885 | | | | | | |
| **Sample Ref:** | AA148077 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP9 | | | | | | |
| **Top Depth(m):** | 0.60 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] < 0.20 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 2.4 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 9.5 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.055 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | < 0.0002 | < 0.0002 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0007 | 0.0065 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0057 | 0.057 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | < 0.0005 | < 0.0005 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.34 | 3.4 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 59 | 580 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 2.9 | < 50 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 15 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215886 | | | | | | |
| **Sample Ref:** | AA148080 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP10 | | | | | | |
| **Top Depth(m):** | 0.50 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 0.57 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 2.2 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 9.1 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.10 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | < 0.0002 | < 0.0002 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 70 |
| Copper | 1455 | U | < 0.0005 | < 0.0005 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0028 | 0.028 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | < 0.0005 | < 0.0005 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | 0.0095 | 0.096 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.3 | 23 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.16 | 1.6 | 10 | 150 | 500 |
| Sulphate | 1220 | U | 23 | 230 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 85 | 840 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 2.9 | < 50 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 14 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215887 | | | | | | |
| **Sample Ref:** | AA148083 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP11 | | | | | | |
| **Top Depth(m):** | 0.40 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 2.9 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 5.8 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.2 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.069 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | 0.0037 | 0.037 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | 0.0020 | 0.020 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0028 | 0.028 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0009 | 0.0091 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | 0.0037 | 0.037 | 0.4 | 10 | 40 |
| Lead | 1455 | U | 0.0014 | 0.014 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | < 0.0005 | < 0.0005 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | 0.007 | 0.068 | 4 | 50 | 200 |
| Chloride | 1220 | U | 2.0 | 20 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.12 | 1.2 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 35 | 350 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 15 | 150 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 15 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215889 | | | | | | |
| **Sample Ref:** | AA158663 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP12 | | | | | | |
| **Top Depth(m):** | 0.10 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 0.52 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 2.9 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [AC] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [AC] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [AC] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.6 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.13 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | < 0.0002 | < 0.0002 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0005 | 0.0051 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0058 | 0.058 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | < 0.0005 | < 0.0005 | 0.4 | 10 | 40 |
| Lead | 1455 | U | < 0.0005 | < 0.0005 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | 0.0005 | 0.0054 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.44 | 4.4 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 62 | 620 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 3.9 | < 50 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 14 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

# Results - Single Stage WAC

**Project: 23300 Project Appollo Grangecastle Dublin (Ramboll)**

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **Chemtest Job No:** | 21-19137 | | | | | | |
| **Chemtest Sample ID:** | 1215891 | | | | | | |
| **Sample Ref:** | AA148092 | | | | | | |
| **Sample ID:** | | | | | | | |
| **Sample Location:** | TP13 | | | | | | |
| **Top Depth(m):** | 0.50 | | | | | | |
| **Bottom Depth(m):** | | | | | | | |
| **Sampling Date:** | | | | | | | |
| **Determinand** | **SOP** | **Accred.** | **Units** | | **Inert Waste Landfill** | **Stable, Non-reactive hazardous waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| Total Organic Carbon | 2625 | U | % | [A] 0.58 | 3 | 5 | 6 |
| Loss On Ignition | 2610 | U | % | 4.0 | -- | -- | 10 |
| Total BTEX | 2760 | U | mg/kg | [A] < 0.010 | 6 | -- | -- |
| Total PCBs (7 congeners) | 2815 | N | mg/kg | [A] < 0.0010 | 1 | -- | -- |
| TPH Total WAC | 2670 | U | mg/kg | [A] < 10 | 500 | -- | -- |
| Total Of 17 PAH's | 2800 | N | mg/kg | [A] < 0.20 | 100 | -- | -- |
| pH | 2010 | U | | 8.7 | -- | >6 | -- |
| Acid Neutralisation Capacity | 2015 | N | mol/kg | 0.012 | -- | To evaluate | To evaluate |
| **Eluate Analysis** | | | **10:1 Eluate mg/l** | **10:1 Eluate mg/kg** | **Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg** | | |
| Arsenic | 1455 | U | 0.0013 | 0.013 | 0.5 | 2 | 25 |
| Barium | 1455 | U | < 0.005 | < 0.0005 | 20 | 100 | 300 |
| Cadmium | 1455 | U | < 0.00011 | < 0.00011 | 0.04 | 1 | 5 |
| Chromium | 1455 | U | 0.0007 | 0.0067 | 0.5 | 10 | 70 |
| Copper | 1455 | U | 0.0016 | 0.016 | 2 | 50 | 100 |
| Mercury | 1455 | U | < 0.00005 | < 0.00005 | 0.01 | 0.2 | 2 |
| Molybdenum | 1455 | U | 0.0015 | 0.015 | 0.5 | 10 | 30 |
| Nickel | 1455 | U | 0.0012 | 0.012 | 0.4 | 10 | 40 |
| Lead | 1455 | U | 0.0006 | 0.0062 | 0.5 | 10 | 50 |
| Antimony | 1455 | U | < 0.0005 | < 0.0005 | 0.06 | 0.7 | 5 |
| Selenium | 1455 | U | 0.0005 | 0.0051 | 0.1 | 0.5 | 7 |
| Zinc | 1455 | U | < 0.003 | < 0.003 | 4 | 50 | 200 |
| Chloride | 1220 | U | < 1.0 | < 10 | 800 | 15000 | 25000 |
| Fluoride | 1220 | U | 0.54 | 5.4 | 10 | 150 | 500 |
| Sulphate | 1220 | U | < 1.0 | < 10 | 1000 | 20000 | 50000 |
| Total Dissolved Solids | 1020 | N | 64 | 640 | 4000 | 60000 | 100000 |
| Phenol Index | 1920 | U | < 0.030 | < 0.30 | 1 | - | - |
| Dissolved Organic Carbon | 1610 | U | 7.9 | 79 | 500 | 800 | 1000 |

| **Solid Information** | |
|---|---|
| Dry mass of test portion/kg | 0.090 |
| Moisture (%) | 22 |

## Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.