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Infrastructure Report

Lands at Kilnahue, Gorey, Co.Wexford

For

GLENVEAGH HOMES LTD

akmdesign.ie

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1 INTRODUCTION

1.1 BACKGROUND

AKM Design were commissioned by Glenveagh Homes Ltd. to prepare a civil infrastructure design report for the proposed Large-scale Residential Development (LRD) at Kilnahue, Gorey, Co. Wexford. This report is intended to form part of a Planning Submission detailing the proposed civil infrastructure of the site.

1.2 EXISTING SITE

The existing site is a zoned residential site located in Kilnahue, west of Gorey Educate Together National School. The site is bound on the north by an unzoned agricultural area and to the east by Kilnahue Lane and to the west by agricultural land. The site is located approximately 1.5km west of Gorey Town Centre.



Figure 1.1 Proposed site location

1.3 EXISTING GROUND CONDITIONS

A detailed site investigation was undertaken by Site Investigations Ltd. to determine the ground conditions and soil type characteristics of the site. The ground investigation included trial pits, dynamic probing, and extensive soil infiltration testing. Soil testing was also undertaken to determine the soil type and soil classification. The report concluded that the site was dominated by cohesive light brown slightly sandy slightly gravelly silty CLAY with high cobble and low boulder content soils.

Infiltration test results were poor in large parts of the site which were unsuitable for infiltration. However, infiltration did occur in some of the higher elevations on-site. Indicating that SUDS might be more effective in these areas.



Figure 1.2 Ground Testing Locations

1.4 PROPOSED DEVELOPMENT

The proposed LRD is comprised of 413no. residential units and 1no. creche comprising off 349no. houses and 64no. apartment/duplex units. The proposal also includes a mixed-use greenway and bicycle and pedestrian paths on Kilnahue Lane.



Figure 1.3 Proposed Site Layout Plan

2 EXISTING PUBLIC SERVICES

2.1 GENERAL

A comprehensive topographical survey was carried out for the subject site. Existing drainage and utility records in the vicinity of the site were obtained from Uisce Eireann.

A summary of the existing services is provided below, and the Uisce Eireann records can be found as an appendix to this report.

2.2 FOUL WATER DRAINAGE

Uisce Eireann records for the surrounding area show an existing 150mm gravity sewer south of the proposed development on Carnew Road. This flows east towards Gorey town centre and increases in size to 225mm once it passes the Ardmore estate 500m east of the subject site. All foul drainage ultimately drains to the Gorey Wastewater Treatment Plant (WWTP) and Pump Station before being pumped to the Courttown WWTP.

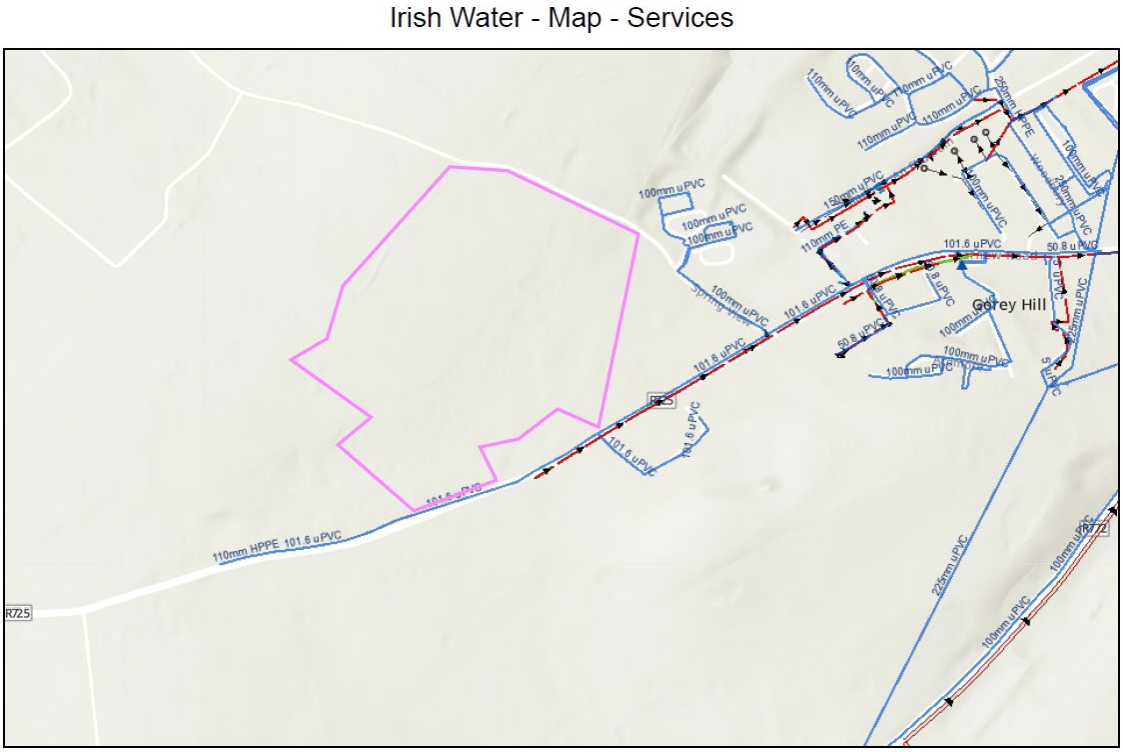

Figure 2.1 Existing Services Map [Source: Uisce Eireann]

2.3 SURFACE WATER DRAINAGE

The existing site is steeply graded greenfield site with poor infiltration characteristics. Runoff from the site discharges to an open channel along the southern border of the site which runs along Carnew Road. This watercourse gathers runoff from the fields and roads in the surrounding area and discharges to an existing watercourse and culvert which flows east and runs south of the existing Gaelscoil. This existing culvert is not yet mapped on the Uisce Eireann GIS system, but it was examined during a site visit and is mapped by the EPA to connect to a tributary of the Banoge River.



Figure 2.2 Existing Culvert View from Kilnahue Lane

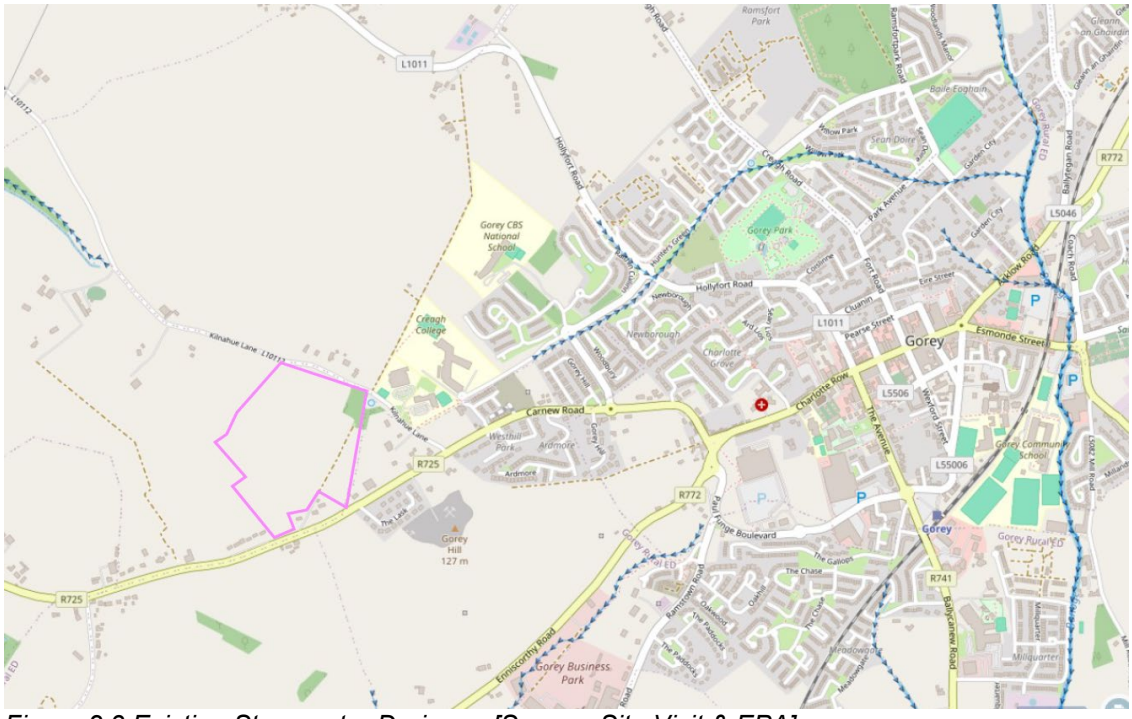

Figure 2.3 Existing Stormwater Drainage [Source: Site Visit & EPA]

2.4 MAINS WATER SUPPLY

Uisce Eireann records show a 100mm diameter watermain which runs south of the site on Carnew Road and along Kilnahue Lane connecting the existing schools back to the watermain network within Gorey town centre. Another 100mm diameter uPVC watermain runs along Carnew Road along the southern border of the site and connects to the watermain on Kilnahue Lane.

3 PROPOSED SURFACE WATER DRAINAGE & ATTENUATION

3.1 SURFACE WATER POLICY

The management of surface water for the proposed development has been designed to comply with the policies and guidelines outlined in the Greater Dublin Strategic Drainage Study (GDSDS), and the requirements of Wexford County Council. The guidelines require the following 4 main criteria to be provided by the design:

- Criterion 1: River Water Quality Protection – satisfied by providing interception storage and treatment within the rain gardens, swales, tree pits, detention basins, permeable paving and garden areas.
- Criterion 2: River Regime Protection – satisfied by attenuating to greenfield run-off rates.
- Criterion 3: Level of Service (flooding) for the site – satisfied by the development's surface water drainage design, planned flood routing, run-off contained within site, flood storage and all buildings set greater than 0.5m above 100-year flood level & high-water level in the attenuation features.
- Criterion 4: River flood protection – attenuation volume and discharge limit designed to greenfield run-off rates (long term storage not provided).

3.2 SURFACE WATER STRATEGY

The details of the surface water drainage strategy for the subject site are presented in this report for assessment. To meet the requirements of the surface water policy above, the surface water strategy has been described in this section to give a clearer indication of how the design of the development has progressed to the submitted design.

In the engineering assessment of surface water quality and routing management, the fall location of the rainwater and its subsequent flow route to the receiving environment play significant roles. Treatment will be determined based on these parameters. Both source and site-wide treatment/SUDS measures will be strategically positioned along various flow routes. Consultations with Wexford County Council at 247 and 32B Stage indicated a preference for nature-based drainage solutions which were implemented in the proposed drainage strategy for the site.

The subject site has six primary categories of surface water run-off: green space (Private Gardens), soft landscaping (Public Spaces), roofs, hard landscaping, parking, and roads. These categories are further differentiated based on public and private ownership. The implementation of sustainable urban drainage components depends on the flow trajectory and anticipated ownership and maintenance responsibilities. Each form is discussed, and concepts established

- Green Space (Private Gardens & Private Communal Spaces).

The primary recipients of the surface water are groundwater and plant uptake. Minimal maintenance is anticipated. To mitigate local flood risks, the design will include overflow gullies. For most storm events up to 1%AEP, there will be no input to the conveyance system, in accordance with the recommendations of the GDSDS.

- Green Space (Public Parks)

The primary recipients for surface water in these areas are groundwater and plant uptake. Landscaping and vegetation strategies will be employed to enhance drainage and promote plant water uptake. Flow paths and SuDS/NBS features direct runoff towards public open space. The open areas will be formed to encourage rainfall runoff to be managed as part of the landscape and it is anticipated that areas of greenspace may be subject to temporary ponding particularly after significant rainfall. Day-to-day rainfall runoff is proposed to travel along low flow route. Due to the steep topography of the site swales are proposed to manage excess runoff from open spaces.

- Roofs (Housing Units)

Run-off from the roofs will be guided through the stone buildup underneath the permeable paving and towards vegetated zones at the property's front. In extreme events, an overflow connection to the main conveyance drainage network will be provided.

- Hard Landscaped Areas (footpaths)

Water run-off in these regions will typically be channelled to edge drainage systems or to systematically arranged rain gardens, bio-retention areas, swales, vegetated areas, and green spaces. Hard landscaped (Footpaths) surfaces are designed to slope towards green spaces, facilitating natural drainage to the subsoil or absorption by plants.

- Roads (Public)

Water run-off in roads areas will typically be channelled to kerb edge/road edge, which is then directed towards inlets (Dropped kerbs or similar) to green spaces/wetlands, rain gardens, bioswales or depressions. Road runoff will flow over the edge into these spaces, facilitating natural filtration and absorption by the underlying geology or vegetation.

3.3 SUSTAINABLE URBAN DRAINAGE SYSTEMS (SUDS) ASSESSMENT

In accordance with the GDSDS and the limitations on drainage within the site it is proposed to provide SuDS for managing surface water from the development. The aim of the SuDS strategy for the site will be to:

- Attenuate surface water runoff
- Reduce surface water runoff
- Reduce pollution impact
- Replicate the natural characteristics of rainfall runoff for the site

An assessment of the potential SuDS that could be incorporated within the site was conducted using the SuDS Manual, CIRIA 753 and the BRE 365 Digest for Soakaway Design. The following SuDS components are being incorporated into the drainage design for the site.

<u>Permeable Pavement (infiltration type system):</u>
Porous paving block surfacing which can treat rainwater, at source, and allow infiltration through to an underlying porous sub-base. Water is stored within the voids of the sub-base before being slowly released through natural flow via the porous medium. As well as reducing the amount of run-off from the surface, permeable paving will slow down the rate of run-off from the pavement in extreme rainfall events contributing to attenuation of flows. In addition, permeable paving will increase the quality of water which is intercepted by the system through filtration, biodegradation, pollutant absorption and settlement and retention of solids, also the peak flows to the outfall will enhance settlement and biodegradation of pollutants. It is proposed to use permeable paving on all the private car-parking areas as shown on the enclosed drawings.

It is noted that permeable paving is proposed for private areas within the site, the consideration of which is fully compliant with the CIRIA SuDS Manual. This allows for a more efficient and environmentally sensitive, nature-based SuDS design. All residents within the site will be provided with guidance regarding the maintenance and operation of permeable paving in accordance with Section 6.1.1 of Wexford County Council Taking in Charge Policy.

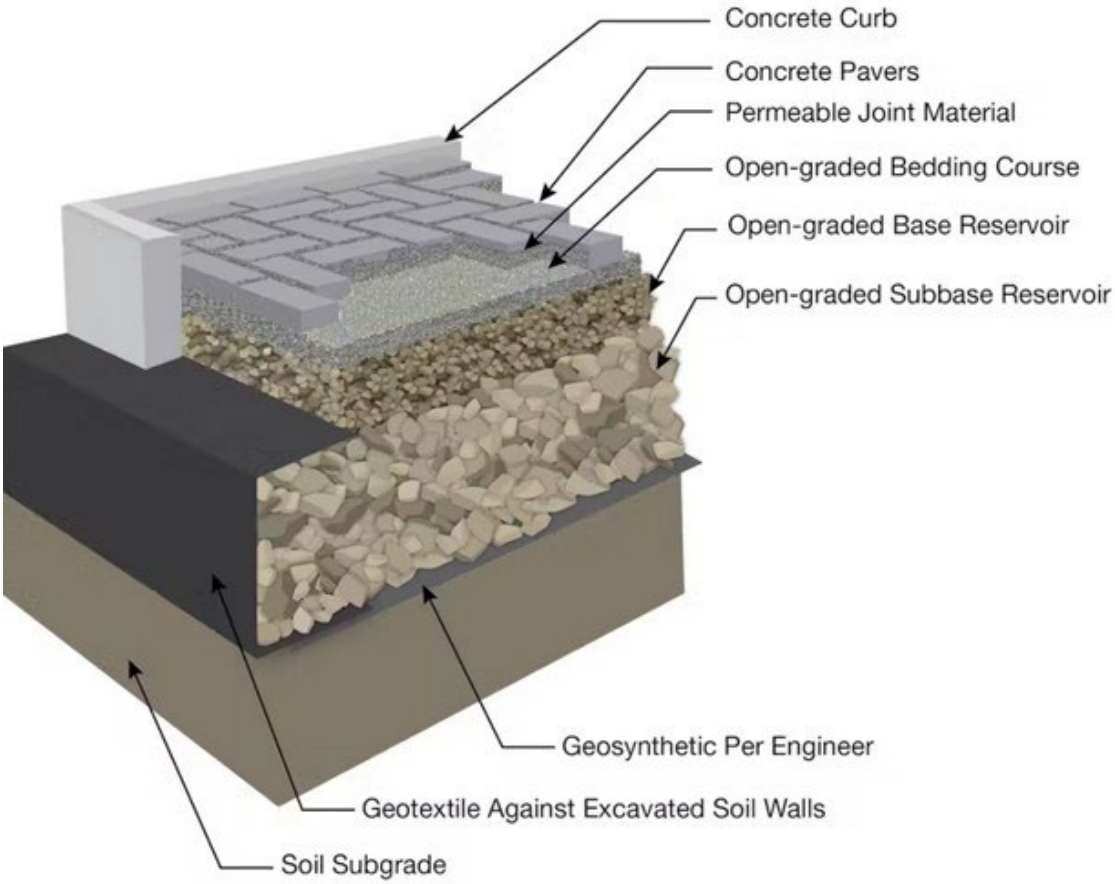

Figure 3.1 Permeable paving to private driveway

Swales:

Swales are shallow, flat bottomed, vegetated open channels designed to convey, treat and often attenuate surface water runoff. When incorporated into site design, they can enhance the natural landscape and provide aesthetic and biodiversity benefits. They are used to drain roads, paths or car parks where it is convenient to collect distributed inflows or runoff or as a means of conveying runoff on the surface while enhancing access corridors or other open space. Swales can replace conventional pipework as a means of conveying runoff, and the use of adjacent filter strips can also remove the need for kerbs or gullies. For this site swales are proposed for use in open space areas where sheet flow from roads discharges directly into the swale. Swales operate best for treatment and interception of runoff when sheet flow discharges directly from road edges into swales. For this reason, footpaths in public open space areas are placed behind the swales and not directly adjacent to roads where they would obstruct this flow. Due to the steep topography of the site, some swales will incorporate check dams or weirs to slow the rate of discharge from the swale and filter drains to maximise infiltration.

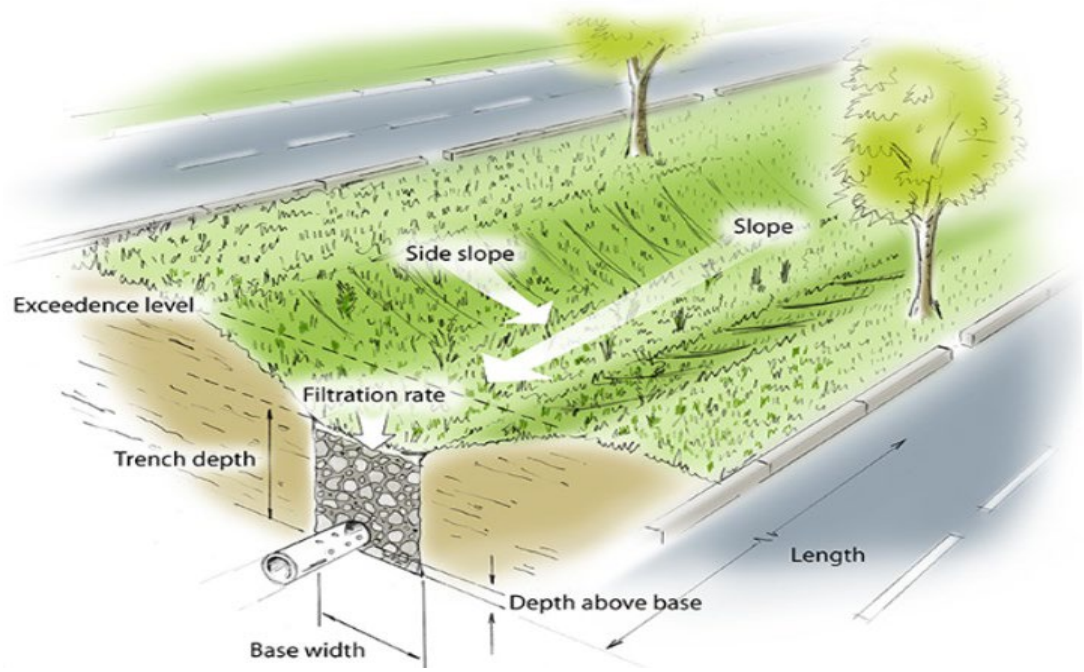

Figure 3.2 Schematic drawing of a typical swale

Herring Bone Land Drain:

The Herring Bone Land Drain System is a subsurface drainage configuration commonly used within Sustainable Drainage Systems (SuDS) to manage surface and groundwater in saturated or poorly drained areas. This system is particularly effective in agricultural fields, sports pitches, parks, and development sites requiring robust drainage to improve soil structure and reduce runoff.

According to the CIRIA SuDS Manual (C753), land drains form part of the permeable conveyance and infiltration systems category within the wider SuDS management train. The herringbone configuration consists of a central main drain with multiple lateral drains branching in at angles (typically 45° or 60°), forming a pattern like a fish skeleton. The lateral drains collect water from the surrounding soil and convey it efficiently to the central collector drain, which then directs flow to a soakaway, infiltration trench, swale, or other designated outfall.



Figure 3.3 Herring Bone Land Drain

Wetlands:

Wetlands are sustainable drainage features that include a permanent pool of water and are characterised by a high proportion of aquatic and emergent vegetation across their surface area. They provide both attenuation and treatment of surface water runoff through enhanced sedimentation, biological uptake and microbial processes supported by dense planting. Wetlands typically incorporate shallow marshy zones, varied depths, and features such as shelves or islands, enabling extended flow paths and optimising pollutant removal. They function as part of the SuDS management train by offering water quality improvement, biodiversity enhancement, and additional landscape amenity.

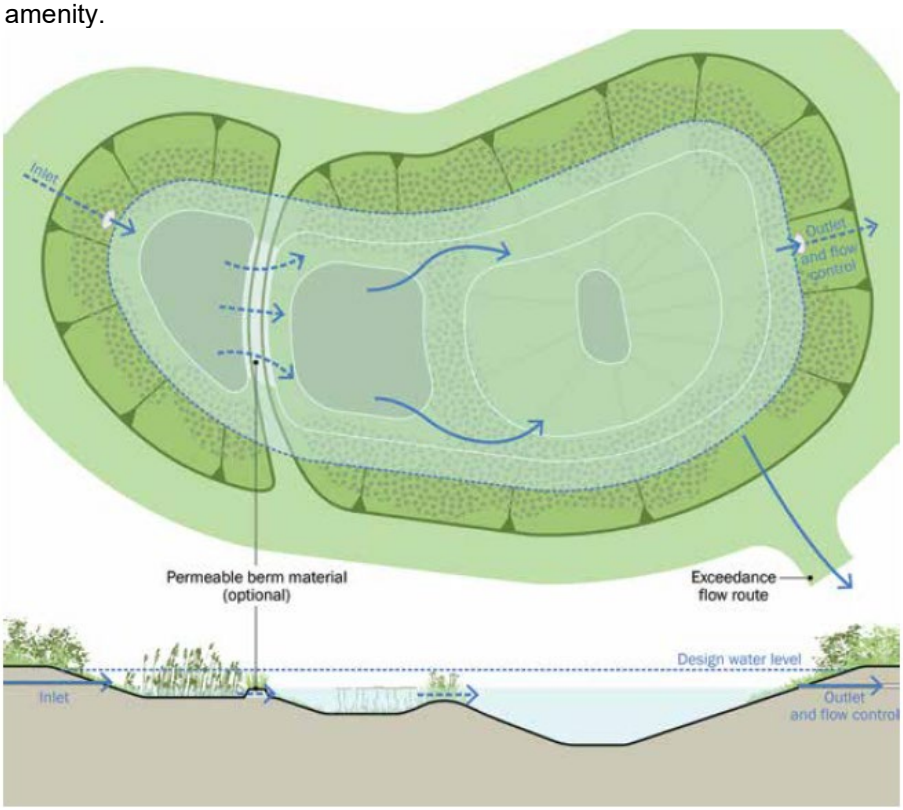

Figure 3.4 Wetland

Bioretention systems:

Bioretention systems (including rain gardens) are shallow landscaped depressions that can reduce runoff rates and volumes and treat pollution using engineered soils and vegetation. They are particularly effective in delivering Interception and can also provide:

I. attractive landscape features that are self-irrigating and fertilising
II. habitat and biodiversity
III. cooling of the local microclimate due to evapotranspiration.

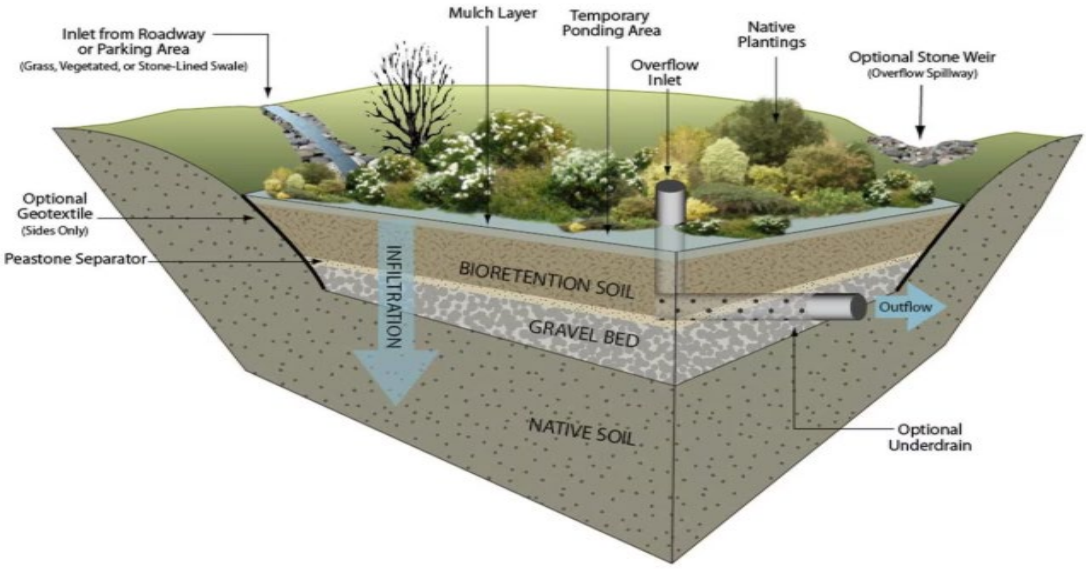

Figure 3.5 Bioretention system

3.4 ATTENUATION

Long term storage of runoff for major storm events is provided through the use of above & below-ground storage areas with an emphasis on a SUDS based approach which prioritises interception and infiltration of “first-flush” runoff. The site is divided into 2no. drainage sub-catchments, each provided with a flow control to limit discharge of runoff during major storm events and promote utilisation of the SUDS components within each catchment area. These SUDS components will provide treatment via filtration, infiltration, evapo-transpiration and long-term storage of runoff from major storm events to minimise the impact of the development on the downstream receiving network.

The runoff discharge rate from the site will not exceed the QBAR greenfield equivalent runoff rate. The stormwater attenuation required for this site was calculated using the Causeway Flow hydraulic modelling software which accounts for the fact that no water will be discharged from the site above the QBAR allowable outflow.

The impermeable areas contributing to the attenuation volume have had the following reduction factors applied:

- Impermeable roofs, roads, footpaths and shared surfaces; a runoff coefficient of 0.90 is being applied to roofs with 0.95 applied to roads & footpaths. This coefficient is considered reasonable to take account of run-off not collected and stored within the micro and macro texture of the surfacing. (Various sources recommend different reduction coefficients e.g. IS EN752 recommends Runoff Coefficient (C for the Rational Method) of 0.9 to 1.0 for impermeable areas and steeply sloping roofs. For flat roofs it recommends 0.5 to 1.0 depending on area).

- Areas of permeable paving, a runoff coefficient of 0.5 has been applied.
- Green areas, a runoff coefficient of 0.2 has been applied to gardens and 0.47 to public open spaces due to the relatively steep slope of the site and the poor infiltration characteristics. This is consistent with soil type 4 according to the CIRIA SuDS Manual.

A summary of the surface water runoff reduction factors and associated areas for each catchment is shown in Table 3-1 below.

Area	Gross Area (m²)	Equivalent Impermeable Area (m²)	Coefficient Runoff
Roads & Footpath	25,764	24,476	0.950
Permeable Parking	14,846	7,423	0.500
Roof	22,062	19,856	0.900
Open Spaces	67,943	31,933	0.470
Green areas & Gardens	25,896	5,179	0.200
Others	-	-	-
Total	**156,511**	**88,867**	0.568

Table 3.1 Surface Water runoff coefficients

Storage of excess runoff takes place in above-ground detention basins and stone beds below-ground.

3.5 DESIGN STANDARDS

Storm-water drainage has been designed in accordance with the GDSDS Volume 2. The following design parameters are applicable to the design:

- Time of entry: 5 minutes
- Pipe friction (Ks): 0.6mm
- Minimum velocity: 1.0 m/s
- Standard Average Annual Rainfall (SAAR): 1,101.2mm
- M5-60: 17.2mm
- Ratio r (M5-60/M5-2D): 0.268
- No flooding of storm network up to 100-year return period with climate change
- FFL - freeboard: greater than 500mm above 100-year flood level
- Climate Change Factor: 20%
- Urban Creep: 10%

Surface water sewers have been designed in accordance with IS EN 752 and the recommendations of the 'Greater Dublin Strategic Drainage Study', (GDSDS).

Surface water sewers will consist of uPVC or concrete (to IS 123) and laid strictly in accordance with Wexford County Council requirements for taking in charge. Manholes will generally take the form of precast concrete rings with precast perfect bases and constructed in accordance with Wexford County Council guidelines & Uisce Eireann Standard Details.

Surface water private drains will generally be 100mm to 150mm diameter and generally will consist of uPVC (to IS123) with concrete surround or concrete socket and spigot pipes (to IS 6). These drains will be laid to comply with "Recommendations for Site Development Works for Housing

Areas" by the Department of the Environment and Local Government, Technical Guidance Document, Section H and B.S. 8301: Building Drainage.

3.6 CLIMATE CHANGE

Surface water calculations for the development made use of rainfall values for the Gorey area as provided by Met Eireann. Rainfall intensities were increased by a factor of 20% to take account of climate change, in accordance with the GDSDS. In addition to this a 10% urban creep factor was applied to the catchment as per the recommendations of the CIRIA SuDS Manual

3.7 SURFACE WATER QUALITY IMPACT

Majority of the proposed development does not present a high risk of run-off contamination as most of the site coverage will be roof area for the housing, green area (open spaces and house yards) and pedestrian walkways. The CIRIA SuDS Manual defines residential roofs and residential streets/driveways as "Low" or "Very Low" pollution hazard level for discharge to groundwater. The Manual also notes that "the risk posed by surface water runoff to groundwater is often low because of the protection afforded by the layers of unsaturated soils between the infiltration surface and the groundwater receptor." Wetlands, swales, permeable paving/soakaways and infiltration trenches are considered adequate for controlling the quality of the runoff expected from a residential development to provide protection of groundwater. They operate by filtering silts, hydrocarbons and other pollutants out of runoff through filtration.

3.8 INTERCEPTION

The GDSDS recommends that no run-off should pass directly to a river for rainfall depths of 5mm and up to 10mm if possible, i.e. interception. This development's SuDS-focused design means that interception storage is provided through permeable paving, swales, filter drains and wetlands. This interception storage will provide attenuation, filtration and treatment of "first-flush" runoff from within the development. Since the discharge rate is limited to Qbar we estimate that this development will have a net positive impact on the regional drainage network.

3.9 FLOOD RISK

The risk of flooding in the pre-development environment and potential impacts on the proposed development were addressed in the LRD Site-Specific Flood Risk Assessment in Section 7 of this report. The assessment determined that any highly vulnerable developments are at a very low risk of flooding for even the CFRAM Coastal Flood Extents – High-End Scenario mapped by the OPW.

4 SuDS OPERATION & MAINTENANCE PLAN

4.1 INTRODUCTION

This section sets out the principles for the long-term management and maintenance of the Sustainable Drainage Systems (SuDS) to be constructed at the new development.

The purpose of this section is to set out the basis of the development SuDS Maintenance Plan and to ensure that the local authority is entrusted with a robust inspection and maintenance programme, ensuring the optimum operation of the surface water drainage network is continually maintained for the lifetime of the development and to prevent the increased risk of flooding both on and off site in accordance with the National Policy.

The activities listed in this document are generic to the relative SuDS types and represent the minimum maintenance and inspection requirements, however additional tasks or varied maintenance frequency may be instructed by the maintenance company as required. Specific maintenance needs of the SuDS elements should be monitored, and maintenance schedules adjusted to suit requirements.

All those responsible for maintenance should follow relevant Health and Safety legislation for all activities listed within this report including lone working, if relevant and risk assessments should always be undertaken.

Any contractor employed by the Management Company shall carry out periodic maintenance of all such SuDS in accordance with the schedules listed in this report. Inspection checks shall be carried out by a qualified and competent person, at the minimum intervals listed within the schedules and the appropriate work carried out.

4.2 SuDS LAYOUT & DESIGN

The storm water drainage strategy for the proposed development utilises SuDS features to intercept and convey all pluvial surface water runoff. The design of the system aims to attenuate runoff and encourage infiltration.

The proposed storm water system consists of the following SuDS components:

- Permeable paving.
- Bioretention systems/rain gardens.
- Stone Mastic Asphalt.
- Swales
- Wetland

There are three categories of maintenance activities referred to in this report:
Regular maintenance (including inspections and monitoring).
Consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.

Occasional maintenance
Comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example).

Remedial maintenance
Comprises intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design.

Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.

4.3 SuDS MANAGEMENT & MAINTENANCE

Permeable Block Paving (Private Areas)

The following section refers to recommendations in the 'Design & Construction of Concrete Block Permeable Pavements', Edition 7, produced by Interpave. It is known that the infiltration rate of permeable block paving will decrease over time due to the build-up of detritus in the jointing material, and then eventually stabilise with age. This is accounted for in the pavement hydraulic design with a suitable factor of safety.

The maintenance of areas of permeable block paving will be the responsibility of the management company.

Recommended maintenance is minimal, as outlined in Table 1 below, and generally no more extensive than that for conventional block paving and less than for conventional gully and pipe drainage. Also, any problems with permeable block paving become apparent on the surface via a visual inspection, unlike the below-ground inspections needed for traditional pipe drainage. If the below measures are implemented as recommended, then the hydraulic performance of the permeable pavement should be unaffected over its design life. However, if the infiltration rate of the paving reduces significantly, allowing storm water to pond on the surface then it is recommended that the blocks should be uplifted and the laying course cleaned or replaced. The laying course and jointing material and permeable paving blocks may be reused, minimising costs.

Pervious pavements should be regularly cleaned of silt and other sediments to preserve their infiltration capacity. Extensive experience suggests that sweeping once per year should be sufficient to maintain an acceptable infiltration rate on most sites. A brush and suction cleaner should be used for regular sweeping. Care should be taken in adjusting vacuuming equipment to avoid removal of jointing material. Any lost material should be replaced.

<u>Planned Preventative Maintenance</u>

Routine Inspection & Monitoring

- Frequency: Quarterly and after major storm events
- Key Checks:

i. Inspecting the surface for sediment accumulation and moss/algae growth.
ii. Checking for standing water after rainfall (indicating reduced permeability).
iii. Assessing joints and infiltration capability of paving.
iv. Inspecting surrounding drainage systems, channels, and outfalls.
v. Checking for displaced or damaged paving blocks

<u>Regular Maintenance Tasks</u>

i. Sweeping & Vacuuming (Every 3-6 Months)
ii. Using a mechanical sweeper with suction to remove fine sediment
iii. Weed, Moss & Algae Control (As Needed, Typically Annually)
iv. Applying herbicide or manually removing weeds growing in joints
v. Jointing Material Replenishment (Annually or as needed)
vi. Inspecting and topping up jointing aggregate in block paving to prevent shifting.
vii. Identifying any subsidence, heaving, or cracking in the pavement
viii. Conducting a simple permeability test by pouring water and timing infiltration
ix. Checking to ensure surrounding kerbs, channels, and geotextiles are intact.

<u>Response Maintenance (RM) – Emergency Maintenance & Repairs</u>

Blocked or Clogged Surface (Water Ponding or Poor Drainage)

- Deploying a regenerative air sweeper or vacuum sweeper for deep cleaning.

- If sediment buildup is excessive, removing and replacing the top layer of jointing aggregate.
- Power brushing to restore porosity.

Flooding or Severe Water Runoff Issues

- Inspecting and clearing nearby drainage channels, gullies, or outlets.
- Checking for soil or debris washed onto the pavement and removing promptly.
- Investigating subsurface clogging; if severe, removing and replacing filter layers.

Structural Damage (Dislodged, Sunken, or Cracked Blocks)

- Re-bedding and replacing damaged or loose blocks using the same material type.
- If subsidence is evident, lifting blocks, recompacting the sub-base, and reinstalling paving.
- For extensive cracking, investigating underlying causes such as heavy loads or poor sub-base compaction

Oil or Chemical Spills

- Containing and absorbing spills using sand, absorbent pads, or specialist granules.
- Removing and replacing contaminated jointing material if necessary.
- Using environmentally friendly degreasers to break down oil residues

Vandalism, Accidents, or Heavy Vehicle Damage

- Replacing vandalized or broken paving blocks with matching material.
- Reinforcing high-traffic areas with heavier-duty paving or sub-base improvements.
- Installing protective bollards or barriers in vulnerable areas to prevent vehicular damage

Freeze-Thaw & Winter Damage

- Repairing frost heave damage by relaying affected paving blocks and ensuring proper sub-base drainage.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 4.1 - Maintenance Plan for Pervious Pavements

Bioretention System/Rain Gardens

During the first few months after installation, the system should be visually inspected after rainfall events, and the amount of deposition measured, to give an idea of the expected rate of sediment deposition. After this initial period, system should be inspected each quarter, to verify the appropriate level of maintenance.

Litter picking should be frequent, as rubbish is detrimental to the visual appearance of bioretention systems. Frequent street sweeping in the catchment area will increase the time interval between cleaning out forebays or the filter surface and will reduce the loading or fine suspended solids that can potentially clog the filter medium.

Herbicides and pesticides (such as Roundup) and fertilizers should not be used on bioretention areas. This is because these pollutants will wash thought the system quite easily.

As industrial site, sediment testing will be essential to verify that there is no toxic or hazardous material from sediments excavated and they can therefore be safely disposed of by either land application or landfilling if there is an appropriate safe and acceptable location to do so.

Planned Preventative Maintenance

Routine Inspection & Monitoring

- Frequency: Quarterly (minimum) and after major storm events
- Key checks:

i. Inspecting inlets, outlets, and overflow structures for blockages.
ii. Checking for standing water after rainfall (indicating reduced infiltration).
iii. Assessing vegetation health, density, and coverage.
iv. Inspecting soil conditions to detect compaction or erosion.
v. Checking for signs of sediment accumulation in filter media.
vi. Monitoring pollutant loads (oil, litter, debris).
vii. Verifying that underdrains (if present) are functioning correctly.

Regular Maintenance Tasks

Debris & Litter Removal (Monthly or as needed)

- Removing organic debris, rubbish, and leaves to prevent clogging.
- Checking to ensure no build-up around inlets, outlets, and overflows.

Weeding & Vegetation Management (Every 3-6 Months)

- Removing invasive plant species to maintain biodiversity.
- Trimming vegetation to encourage healthy root development and maintain design function.
- Replanting if necessary to ensure adequate plant coverage for pollutant filtration.

Mulch Replacement (Annually)

- Topping up or replacing mulch layer to maintain moisture retention and prevent weed growth.
- Removing and replacing contaminated mulch if signs of pollution are present.

Sediment Removal (Annually or as needed)

- Scrapping off excess sediment from the surface to prevent clogging.
- If infiltration is compromised, removing and replacing the top layer of filter media.

Infiltration Rate Testing (Every 1-2 Years)

- Conduct percolation tests to ensure design infiltration rates are maintained.
- If infiltration is slowing significantly, consider remedial aeration or soil replacement.

Structural & Hydraulic Functionality Checks (Annually)

- Inspecting kerbs, embankments, and retaining structures for stability.
- Ensuring that flow control devices, underdrains, and outfalls are working correctly.
- Checking that the system directs water properly and does not bypass treatment.

Response Maintenance (RM) – Emergency Maintenance & Repairs

Blocked or Overflowing Drainage System

- Clearing inlets, pipes, and outlets using manual or mechanical means.
- Removing accumulated silt and check for underlying infiltration issues.
- Restoring vegetation or replace filter media if clogging persists

Persistent Standing Water / Reduced Infiltration

- Aerating or till the topsoil layer to improve permeability.
- Removing and replacing clogged filter media if necessary.
- Checking and clearing underdrains if present.

Structural Damage (Erosion, Bank Slumping, or Washouts)

- Reinforcing eroded areas with additional vegetation or biodegradable erosion control blankets.
- Adjusting grading and introducing additional check dams or flow dissipators.
- Recompacting and reshaping embankments if structural failure is evident.

Pollution Incidents (Oil, Chemical, or Heavy Metal Contamination)

- Isolating the affected area and removing contaminated soil or mulch.
- Applying absorbents for oil spills and disposing of waste correctly.
- Replacing impacted vegetation and filter media

Vandalism, Unauthorized Access, or Damage from Vehicles

- Repairing broken fencing, signage, or protective barriers.
- Replacing damaged vegetation and mulch.
- Installing bollards or barriers in vulnerable locations to prevent vehicle encroachment

Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

Table 4.1 - Maintenance Plan for Bioretention System

Stone Mastic Asphalt (SMA)

The pavement should be inspected regularly, preferably during and after heavy rainfall to check effective operation and to identify any areas of ponding. It needs to be regularly cleaned of silt and other sediments to preserve its infiltration capacity. Sweeping at least once a year. However, observe that, in some instance, sweeping may be required and frequence should be adjusted.

A brush and suction cleaner should be used for regular sweeping. Care should be taken in adjusting vacuuming equipment to avoid removal of jointing material. Any lost material should be replaced. It is also possible to clean the surface using lightweight rotations brush cleaners combined with power spraying using hot water.

Planned Preventative Maintenance

Routine Inspection & Monitoring

- Frequency: Every 6 months and after extreme weather events
- Key Checks:

i. Checking for signs of surface wear, cracking, or fretting.
ii. Inspecting joints and edges for signs of deterioration.
iii. Monitoring skid resistance levels, especially in high-traffic areas.
iv. Checking for rutting, deformation, or potholes.
v. Assessing drainage efficiency, ensuring no standing water is present.
vi. Verifying that road markings and safety features remain intact.

Regular Maintenance Tasks

Sweeping & Surface Cleaning (Quarterly or as needed)

- Using mechanical sweepers to remove debris and prevent clogging of surface voids.
- Ensuring road gullies and drainage channels are free of blockages.

Pavement Surface Treatments (Annually or as required)

- Applying surface dressing or skid-resistant treatments if necessary.
- Reapplying bituminous sealants in areas prone to water ingress.

Joint & Edge Sealing (Every 2-3 Years or as needed)

- Inspecting and resealing construction joints to prevent water infiltration.
- Ensuring that transitions between SMA and other pavement types remain intact.

Structural & Load-Bearing Capacity Checks (Every 5 Years or if damage is noted)

- Conducting deflection testing to assess pavement integrity.
- Evaluating load-bearing capacity in high-stress areas (e.g., intersections, heavy vehicle routes)

Response Maintenance (RM) – Emergency Maintenance & Repairs

Surface Cracking & Fretting

- Applying crack sealing or slurry seal for minor cracks.
- For severe cracking, conducting patch repairs or overlay resurfacing.

Potholes & Structural Failures

- Cleaning out damaged areas and applying a hot-mix SMA patch.
- Compacting the repaired section to match surrounding levels.

Rutting or Surface Deformation

- Milling and replacing affected areas with a fresh SMA overlay.
- Assessing and strengthening the sub-base if deformation is widespread.

Drainage & Water Ponding Issues

- Clearing blockages from road gullies, drains, and channels.
- Adjusting pavement grading or install additional drainage measures.

Oil & Fuel Spillage Damage

- Applying absorbent materials to remove excess oil.
- If binder degradation occurs, cutting and replacing affected SMA sections

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 4.2 - Maintenance Plan for Stone Mastic Asphalt

Wetlands

Wetlands are features with a permanent pool of water that provide both attenuation and treatment of surface water runoff. They can support both emergent and submerged aquatic vegetation along their shoreline and in shallow marshy (wetland) zones, which helps enhance the treatment processes and has amenity and biodiversity benefits. Dense stands of vegetation facilitate the adhesion of contaminants to vegetation facilitate the adhesion of contaminants to vegetation, aerobic decomposition of pollutants and can also help stabilise settled sediment and prevent resuspension.

Attenuation storage is provided above the permanent pool and wetland areas. A flow control system at the outfall controls the rates of discharge for a range of water levels causing the pond to fill during the storm events. Runoff from each rainfall event is detained and treated in the wetland. The volume of the wetland influences the effectiveness of the feature in settling out particulate pollutants, with larger volumes providing longer periods of time for sedimentation to occur and greater opportunities for biodegradation and uptake mechanisms.

Well-designed and maintained permanent water bodies can offer important aesthetic amenity and wildlife benefits to development sites. Ponds and wetlands can be designed as natural features with shallow, grassed side slopes or can be hard landscaped features that complement the character of dense urban environments.

Planned Preventative Maintenance

Routine Inspection & Monitoring

- Frequency: Monthly during the first year, quarterly thereafter (minimum) and after major storm events
- Key Checks:

i. Inspecting permanent pool for sediment accumulation, algae growth and water quality.
ii. Checking inlets, outlets, overflow structures and flow controls for blockages or damage.
iii. Assessing vegetation health, density and coverage in aquatic, marginal and emergent zones.
iv. Inspecting embankments, slopes and safety features (e.g., benches, fencing) for erosion or instability.
v. Monitoring litter, debris and pollutant loads.
vi. Verifying hydraulic performance and no prolonged standing water outside design events.

Regular Maintenance Tasks Debris & Litter Removal (Monthly or as needed)

Removing litter, organic debris, leaves and floating vegetation to prevent clogging.
Weeding & Vegetation Management (2-4 times per year)

- Trimming or mowing marginal and bank vegetation to 75-150mm height.
- Controlling invasive species and harvesting excess aquatic plants to maintain design residence time.
- Replanting bare areas with native, flood-tolerant species.

Sediment Forebay Cleaning (Annually or as needed)

- Removing accumulated sediment from sediment forebay or inlet zones.

Bank & Embankment Checks (Annually)

- Inspecting and minor repairing of slopes and banks for stability.

Response Maintenance (RM) – Emergency Maintenance & Repairs Blocked or Overflowing Inlets/Outlets

Clearing blockages manually or mechanically.

- Inspecting and repairing underdrains or flow controls if applicable.

Excessive Sediment Accumulation / Reduced Pool Depth

- Dredging sediment if accumulation exceeds 10-20% of design depth (typically every 1-3 years, supervised by engineers).
- Disposing of non-toxic sediments appropriately (e.g., land application after ecological assessment).

Erosion, Bank Slumping or Embankment Failure

- Stabilising eroded areas with vegetation, geotextiles or reshaping.

- Regrading slopes (max 1:3) and installing check dams if needed.

Vegetation Die-Off or Disease

- Replanting with suitable species and improving soil/nutrient conditions.
- Treating pests or invasives without herbicides.

Pollution Incidents (e.g., Oil, Chemicals)

- Containing and removing contaminants using absorbents.
- Excavating and replacing affected sediment or vegetation.

Flooding or Structural Damage

- Clearing overflows and repairing outlet structures.
- Restoring wetland zones and geometry as per design.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices, eg penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1 m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay.	Every 1–5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, eg every 25–50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair / rehabilitate inlets, outlets and overflows.	As required

Table 4.3 - Maintenance Plan for Wetlands

Detention Basins/Swales

The operations contained within this section specific to the maintenance of landscaping, shall be read in conjunction with any development landscape maintenance plan(s).

The land drainage system including the detention basin, swales and associated and pipework will be subject to a routine monitoring and maintenance schedule as part of the general site management. This will be carried out at regular intervals between April and October and between

November March unless otherwise detailed. A record of maintenance visits and remedial operations shall be maintained. The following guidelines are offered as an initial regime, but maybe either increased or decreased by the management company depending on the local environment and any external contributing factors.

The key maintenance requirement for the detention basins, swales and associated pipework will be the maintenance of vegetation and mowing of grass within and on the banks/verges and the removal of accumulated sediments and collection of litter and debris.

During the inspections the general operation, and structural condition of the inlet / outlet headwalls and any erosion of banks or scour control features should be identified and rehabilitated as required.

Additional vegetation in and on the banks of the basins should be trimmed at least twice a year or as required to maintain a height of 75–150mm. Cuttings from any clearance work should be removed from the basin/swale to avoid it causing blockages downstream.

Accumulated sediments should be removed from the bed of the swale as required (once deposits exceed 25 mm in depth). The frequency of this operation can vary depending on local conditions. However, it is recommended that the level of silts should be monitored at least once a year and a maintenance regime implemented to suit.

De-silting of the any area will usually be on a 10–15-year cycle depending on the on-going silt level checking. The desilting work will be carried out under the supervision of consulting engineers and to a pre-agreed method statement. Such a method statement should be submitted in writing to South Dublin County Council and agreed in advance of the commencement of the works.

Planned Preventative Maintenance

Routine Inspection & Monitoring

- Frequency: Quarterly and after major storm events
- Key Tasks:

i. Checking for standing water, indicating potential clogging or poor infiltration.
ii. Inspecting inlets, outlets, and overflow structures for blockages or erosion.
iii. Assessing vegetation health and coverage to ensure optimal filtration.
iv. Examining soil conditions for compaction, sediment accumulation, or erosion.
v. Monitoring slopes and embankments for stability and washout risks.
vi. Ensuring surrounding areas are draining correctly into the bioretention system

Regular Maintenance Task

Debris & Litter Removal (Monthly or as needed)

- Removing leaves, litter, and organic debris to prevent blockages.
- Clearing any sediment buildup from inlets and outlets

Weeding & Vegetation Management (Every 3-6 Months)

- Removing invasive species and ensuring diverse plant growth for filtration.
- Pruning plants to maintain intended water flow and avoiding overgrowth.
- Replanting any areas with poor vegetation cover to maintain effectiveness.

Mulch & Soil Replacement (Annually or as required)

- Replenishing mulch layers to maintain moisture and support filtration.
- Aerating or replacing soil

Sediment Removal (Annually or as needed)

- Removing accumulated sediments to prevent clogging and maintain flow.
- If excessive, investigate upstream sediment sources and implement mitigation.

Hydraulic Functionality Checks (Annually)

- Ensuring the system retains and infiltrates stormwater within the expected timeframe.
- Verifying that underdrains (if present) are functioning properly.
- Checking that flow paths are free from obstructions and erosion.

Response Maintenance (RM) – Emergency Maintenance & Repair

Blocked Inlets or Outlets

- Removing obstructions manually or with vacuum equipment if severe.
- Flushing outlets and checking for structural damage

Standing Water or Poor Drainage

- Loosening or replacing compacted soil layers.
- Excavating and removing accumulated sediments from the surface.
- Checking underdrain system and flushing if necessary

Erosion or Bank Slumping

- Regrading and stabilising eroded areas with erosion control blankets or vegetation.
- Adjusting flow paths or installing check dams if necessary.
- Reinforcing embankments with additional planting or soil stabilization techniques

Vegetation Die-Off

- Replanting with native, flood-tolerant species suited to bioretention.
- Amending soil with organic material to improve plant health.
- Assessing water availability and irrigation needs during dry seasons.

Overflow or Flooding Issues

- Checking that overflow structures are properly directing excess water.
- Adjusting flow controls upstream to slow runoff entry.
- Considering expanding or modifying the basin/swale if persistent issues occur.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Table 4.4 - Maintenance plan for the Detention basins/Swales

4.4 RECORD KEEPING

All Sustainable Drainage Systems (SuDS) on-site will be subject to a comprehensive record-keeping system, similar to a statutory “Safety File”, to ensure ongoing compliance, effective maintenance, and long-term performance monitoring. This will include paper, digital, and photographic records documenting the design, construction, inspection, and maintenance of all SuDS features.

Key records will consist of as-built drawings, hydraulic performance data, maintenance logs, inspection reports, repair history, and vegetation management records. Photographic evidence will be collected periodically to track system condition, sediment accumulation, vegetation health, and any structural or operational issues.

Digital records will be securely stored and made accessible to relevant stakeholders, including site management, maintenance personnel, and local authorities, ensuring transparency and accountability. This systematic approach to record-keeping will facilitate timely interventions, support future site modifications, and provide a historical reference for SuDS performance over the site's lifetime. Responsibility for maintenance and maintaining these records will fall upon the developer / management company for a period of 18 months after practical completion or until such time as the development is taken in charge, whichever is the sooner.

4.5 INFORMATION TRANSFER/HANDOVER

All Sustainable Drainage Systems (SuDS) records of design and construction, as outlined in Section 4 above, (including this report which outlines appropriate maintenance procedures) are to be made available to all stakeholders including (but not limited to) council, owner management company and residents. This is to be in suitable paper and digital format and is to take place at the time of sale/transfer and taking in charge.

5 PROPOSED FOUL WATER DRAINAGE

5.1 PROPOSED FOUL WATER LAYOUT

Foul drainage to the site will be provided via gravity to connect to the public network east of the subject site. A Pre-Connection Enquiry was submitted to Uisce Eireann and a Confirmation of Feasibility was received on May 1st, 2025 and is included as an appendix to this report. The CoF indicated the following relating to foul drainage supply:

"In order to facilitate the proposed connection at the Development, the Uisce Éireann wastewater network will have to be extended by approximately 120m from Carnew Road. In addition to this required network extension, approximately 2.2km of network upgrades to the existing wastewater network will be required to provide additional network capacity for the proposed scale of development.

Uisce Éireann does not currently have any plans to undertake these works, therefore the applicant will be required to fund these local network extensions and upgrades (the exact extent of which shall be assessed further at connection application stage). These works will be carried out by Uisce Éireann and the costs for this will be included in your connection fee."

A design for the off-site upgrades to the local foul network is included as part of this application and has been submitted to Uisce Eireann for approval.

5.2 DESIGN CALCULATIONS

The proposed foul water drainage system for the subject site has been designed to discharge into the existing foul drainage system for the entire site within the approved planning permission. All new main foul sewers are designed to discharge by gravity to the existing foul water drainage network. Minimum gradients and pipe diameters for the main sewers are designed in accordance with the principles and methods set out in Uisce Eireann's Code of Practice & Standard Details for Wastewater Infrastructure, IS EN 752 (2008), IS EN12056: Part 2 and Building Regulations Part H.

6 PROPOSED WATER SUPPLY

6.1 WATER SUPPLY - GENERAL

Water supply to the development will be provided through 3no. connections to the public network on Carnew Road and Kilnahue Lane. A Pre-Connection Enquiry was submitted to Uisce Eireann and a Confirmation of Feasibility was received on May 1st, 2025 and is included as an appendix to this report. The CoF indicated the following relating to water supply:

"In order to facilitate the proposed connection at the Development, the Uisce Éireann water network will have to be extended by approximately 150m along Kilnahue Lane. In addition to this required network extension, approximately 860m of network upgrades to the existing water network will be required to provide additional network capacity.

Uisce Éireann does not currently have any plans to undertake these works, therefore the applicant will be required to fund these local network extensions and upgrades. These works will be carried out by Uisce Éireann and the costs for this will be included in your connection fee."

A design for the off-site upgrades to the local water network is included as part of this application and has been submitted to Uisce Eireann for approval.

6.2 WATERMAIN DESIGN & CALCULATIONS

The following criteria will be applied:

- Watermains shall be laid in non-trafficked areas to maximum possible extent
- The location of valves, hydrants, air valves etc. in trafficked areas shall be avoided wherever practical.
- Watermains shall not pass under any structure
- An average cover of 0.9m shall be provided in trafficked areas
- Proper designed concrete thrust blocks shall be provided at all bends and tees located along the watermain where required.
- Marker tape, in blue PVC and incorporating a corrosion resistant tracing system and printed with the works 'WATERMAIN' throughout shall be laid directly over the centre line of the pipe, at least 300mm above the pipe. The tracer system shall be continuous and adequately secured to valves and fittings
- No common connections shall be provided. Each dwelling shall have its own individual connection.
- All boundary boxes/meter chambers shall be located in public access areas

The water demand is designed in accordance with the principles and methods set out in Uisce Eireann's Code of Practice for Water Infrastructure Connections and Developer Services Design & Construction Requirements for Self-Lay Developments July 2020.

Overall water demand is calculated using UE CoP for Water Infrastructure section 3.7.2.

6.3 HYDRANTS

Hydrants shall comply with the requirements of BS 750:2012 and shall be installed in accordance with Uisce Eireann's Code of Practice and Standard Details & TGD Part B. Refer to AKM drawings for the watermain layout which also shows hydrant locations.

7 SITE ACCESS AND ROAD LAYOUT

7.1 EXISTING ACCESS

The site is currently under agricultural use with 2 no. gated access from Kilnahue Lane. See figure 7-1 below.

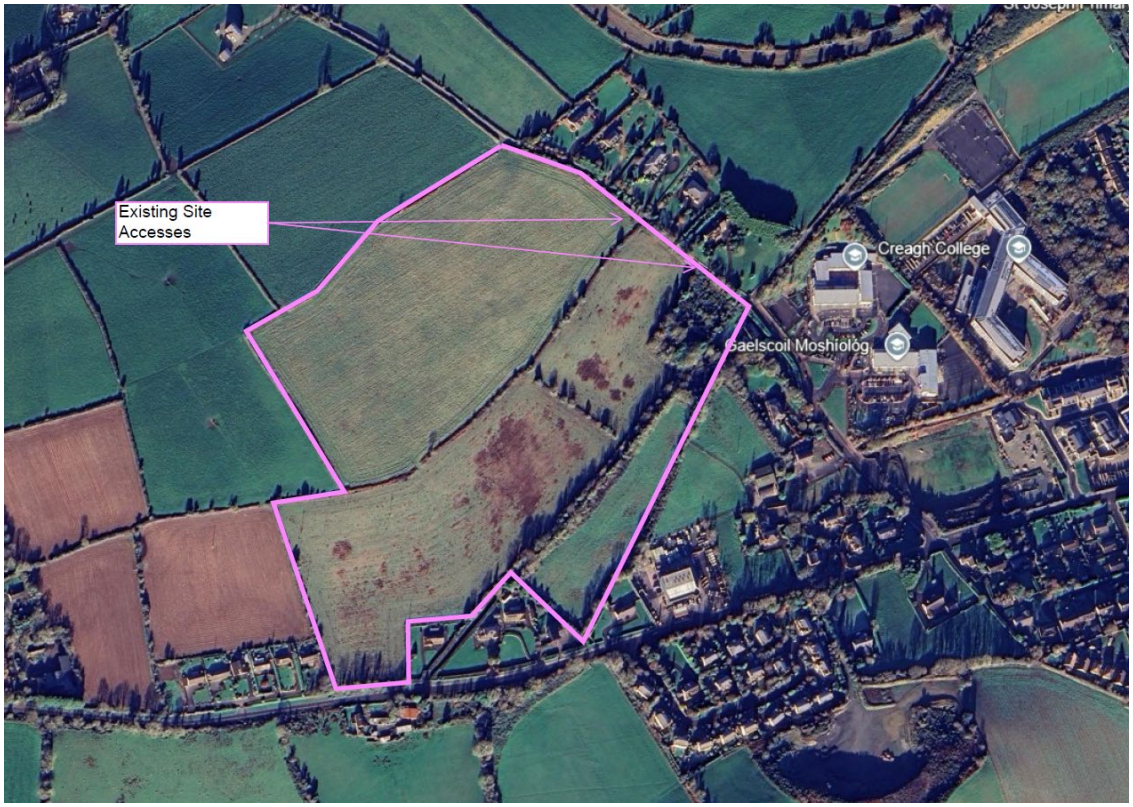

Figure 7-1. Existing access into the site

7.2 PROPOSED VEHICULAR ACCESS

There are 3 proposed vehicle accesses to the site – 2 no. on Kilnahue Lane and 1 no. on Carnew Road as shown in figure 7-2 below. An additional pedestrian/cycle access is proposed for Kilnahue Lane.



Figure 7-2. Proposed Vehicular access into the site

As per the guidelines laid out in the Design Manual for Urban Roads & Streets (DMURS) standard roads in the development will be 5.5m wide with a 2m wide footpath. Internal radii on bends will generally be 3m. Any homezones/shared spaces within the development will have a 4.8m wide trafficable area with a 1.2m wide pedestrian refuge area. The primary link road through the development will have a 6m trafficable width and road build-ups and cross sections are consistent with Wexford County Council Taking-In-Charge Policy (Refer to drawing 25007-AKM-XXXX-XX-DR-C01-510001). Traffic calming will be provided via ramp entrances to the development and each home zone. A layout is proposed which manages speed by restricting the length of any straight roads and speed cushions are proposed throughout the development as further traffic management. Speed cushions are proposed over standard ramps because they do not impact road drainage or entrances to private driveways. Additional speed ramps/cushions and junction

tabletops are also proposed throughout the development. A separate DMURS compliance statement has been prepared by the project traffic consultant. (Refer from 25007-AKM-XXXX-XX-DR-C01-500001 to 25007-AKM-XXXX-XX-DR-C01-500005 and 500006)

7.3 PROPOSED PEDESTRIAN ACCESS

Pedestrians and cyclists will access the site at the same locations as the vehicular access introduced above with an additional access to the proposed shared path. The subject development proposals include for new footpaths along the perimeter of the site that leads to the site access location.

7.4 SWEPT PATH ANALYSIS

The internal streets for the subject site have been designed as per the recommendations of DMURS in including internal road dimensions, longitudinal slopes and corner radii. The proposed whole development was designed to accommodate all types of anticipated vehicles which include cars, refuse vehicles and fire tender vehicles. (Refer to drawing 25007-AKM-XXXX-XX-DR-C01-510001

A swept path analysis has been carried out on the proposed road layout to demonstrate that the site's proposed corner radii and turning heads will accommodate everyday vehicles such as cars. Other vehicles such as refuse trucks and fire tender have also been tracked to ensure they can turn and manoeuvre around the development.

7.5 PROPOSED PARKING

Car parking has been provided in curtilage for all housing units with additional on-street parking to be provided for duplex/maisonette units and visitor parking provided in strategic locations throughout the site including adjacent to the proposed open space to the north-east of the development.

8 FLOOD RISK ASSESSMENT

8.1 INTRODUCTION

This Flood Risk Assessment has been carried out in accordance with the DEHLG/OPW Guidelines on the Planning Process and Flood Risk Management published in November 2009. This assessment identifies the risk of flooding at the site from various sources and sets out possible mitigation measures against the potential risks of flooding. Sources of possible flooding include coastal, fluvial, pluvial (direct heavy rain), groundwater and drainage system failure. This section provides an assessment of the subject site for flood risk purposes only.

8.2 SITE BACKGROUND

The subject site is a greenfield site, currently used for agricultural purposes. Figure 8.1 outlines the development site and how the local drainage network connects to the River Banogue and its tributaries.



Figure 8-1. Site Location and Nearby Watercourses [Source: EPA]

8.3 TOPOGRAPHY

Topographic survey data shows that the site falls generally from west to the east, from a high point of approximately 133.5m at the west of the site to a low point of approximately 101.5m at the east. There is a surface water ditch at approximately 97.50m to the east of the site which drains the site to the Banoge River but this is not currently mapped.

8.4 WATERCOURSES

The River Banoge is the main watercourse in the Gorey area and is located 2.1km to the east of the site. Drainage networks around the site follow the natural topography of the area and discharge to this river.

8.5 FLOOD HISTORY

The historical flooding history for the already approved entire site was obtained from national flood hazard mapping website, www.floodmaps.ie, which highlights areas at risk of flooding through the collection of recorded data and observed flood events. See Figure 8-2 for historic flood events in the area.

Review of Figure 8-2 does not show any instances of flooding at the subject site with some instances of historical flood at the Banoge River over 2km away.

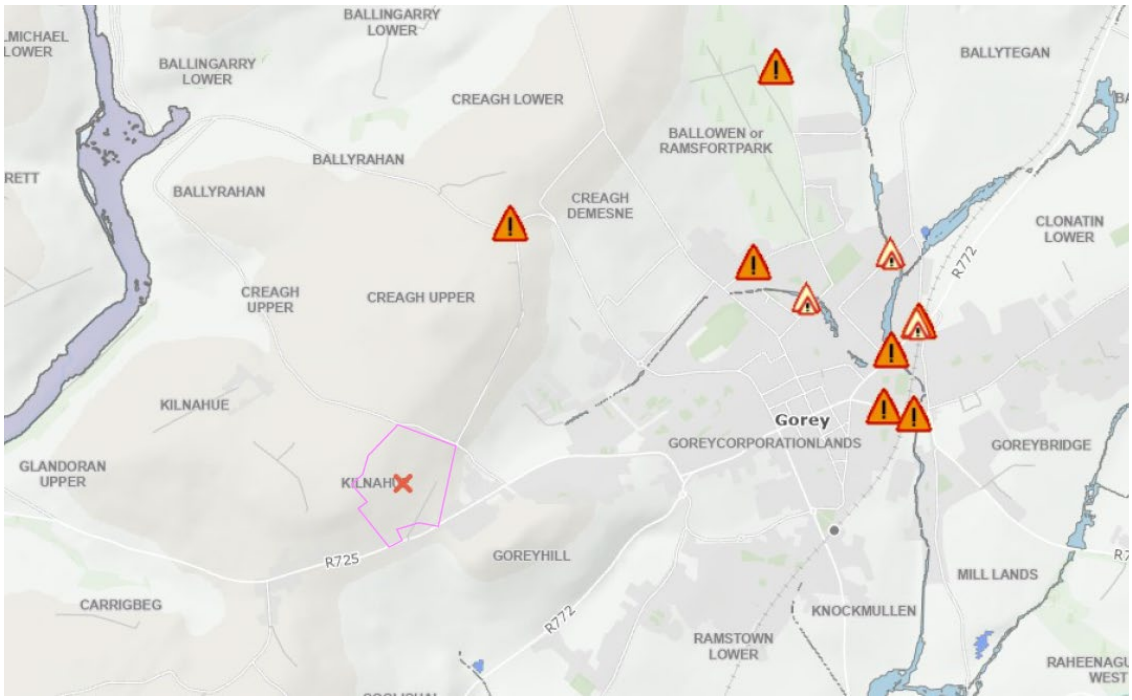

Figure 8-2. Historical Flooding [Source: Floodinfo.ie]

A report detailing previous flood events in the area is included as an appendix to this report.

8.6 PREDICTIVE FLOODING

The site has been subject to review under two predictive flood mapping / modelling studies:

- CFRAM Coastal Flood Extents – High-End Future Scenario:
  - Low Probability flood events have an indicative 1-in-a-1000 chance of occurring or being exceeded in any given year. This is also referred to as an Annual Exceedance Probability (AEP) of 0.1%.
  - The High-End Future Scenario extents where generated taking in in the potential effects of climate change using an increase in rainfall of 30% and sea level rise of 1,000 mm (40 inches)
- CFRAM River Flood Extents – High-End Future Scenario:
  - Low Probability flood events have an indicative 1-in-a-1000 chance of occurring or being exceeded in any given year. This is also referred to as an Annual Exceedance Probability (AEP) of 0.1%.
  - The High-End Future Scenario extents where generated taking in in the potential effects of climate change using an increase in rainfall of 30% and sea level rise of 1,000 mm (40 inches)

The results from the CFRAM analysis are depicted in the CFRAM Flood Map in Figure 8-3 below. It can be seen that the subject site is not at risk from fluvial or coastal flooding under the high-end future flood scenario.



Figure 8-3. CFRAM High-End Future Scenario - Flood Map

8.7 CONCLUSION

The subject lands have been analysed for risks from flooding from the Irish Sea, fluvial flooding, pluvial flooding and ground water. Whilst residential developments are considered highly vulnerable to flooding it has been determined that the residual flood risk from any source is low.

9 PHASING

The proposed infrastructure will be delivered in accordance with the phasing strategy in the site plan. Phase 1 includes the installation of key infrastructure components such as the oil interceptor, wetland, and the main water supply connection.
Any off-site infrastructure upgrades required to the development will be subject to the review and formal approval of Uisce Éireann.

Signed:



Cathal Kennedy BA, BAI, MSc, CEng, MIEI
AKM Consulting Engineers

APPENDIX A – TOPOGRAPHICAL SURVEY


Top of Bank
Bttm of Bank
Fence
Hedge
Ditch
Gate
Post
Tree
Overgrown
Gravel
Tarmac
Concrete
Grass
Building
Wooded Area-No Access
Edge of Hedge
Edge of Road
Gas Valve
Manhole
Cable
Pipe
Sta 3428.169
N 9239.591
7001 125.200
Sta 3741.794
N 8334.333
5021 100.286
Sta 3651.851
N 9221.242
104.463
Sta 3610.363
N 9216.536
5023 103.673
Sta 3502.862
N 9157.174
5024 99.859
Sta 3821.187
N 8351.751
5022 104.518
Sta 3706.305
N 9416.586
5018 100.165
Sta 3713.160
N 9194.958
104.305
Sta 3715.662
N 8732.211
104.128
Sta 3718.116
N 8396.099
5027 102.429
Sta 3691.671
N 8812.235
5013 104.518
Sta 3830.819
N 8554.277
5026 103.165
Sta 3821.187
N 8351.751
5022 104.518
Sta 3811.512
N 8151.991
5019 100.204
Sta 711922.295
E 659457.277
1003 111.006
Sta 711506.371
E 659047.114
5001 103.662
Sta 3342.969
N 8229.854
c=3605 116.479
Sta 3741.794
N 8334.333
5021 100.286
Sta 3651.851
N 9221.242
104.463
Sta 3610.363
N 9216.536
5023 103.673
Sta 3502.862
N 9157.174
5024 99.859

APPENDIX B – GROUND INVESTIGATION REPORT

S.I. Ltd Contract No: 5861

Client:	Gerard Gannon Properties
Engineer:	Waterman Moylan
Contractor:	Site Investigations Ltd

Gorey Hill,
Gorey, Co. Wexford
Site Investigation Report

Prepared by:

.....

Stephen Letch

Issue Date:	25/06/2021
Status	Final
Revision	1

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2.	Site Location	1
3.	Fieldwork	1
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5.	Ground Conditions	3
6.	Recommendations and Conclusions	4

Appendices:

1. Trial Pit Logs and Photographs
2. Soakaway Test Results
3. Geotechnical Laboratory Test Results
4. Environmental Laboratory Test Results and Waste Classification Report
5. Survey Data

1. Introduction

On the instructions of Waterman Moylan, Site Investigations Ltd (SIL) was appointed to complete a ground investigation at Gorey Hill, Gorey, Co. Wexford. The investigation was completed for a residential development on the site and completed on behalf of the Client, Gerard Gannon Properties. The investigation was completed in June 2021.

2. Site Location

The site is located on lands at Kilnahue and Gorey Hill to the west of Gorey town centre in north Co. Wexford. The map on the left shows the location of Gorey in north Co. Wexford to the south of Dublin and the location of the site in the town is shown on the right.





3. Fieldwork

The fieldworks comprised a programme of trial pits with dynamic probes, soakaway tests and California Bearing Ratio tests. All fieldwork was carried out in accordance with Eurocode 7: Geotechnical Design and IEI Specification & Related Documents for Ground Investigation in Ireland (2006).

The fieldworks comprised the following:

- 8 No. trial pits with dynamic probes
- 8 No. soakaway tests

3.1. Trial Pits

8 No. trial pits were excavated using a wheeled excavator. The pits were logged and photographed by SIL geotechnical engineer and representative disturbed bulk samples were recovered as the pits were excavated. The trial pits were backfilled with the arisings immediately upon completion.

Adjacent to the trial pits, dynamic probes were completed using a track mounted Competitor 130 machine. The testing complies with the requirements of BS1377: Part 9 (1990) and Eurocode 7: Part 3. The configuration utilised standard DPH (Heavy) probing method comprising a 50kg weight, 500mm drop height and a 50mm diameter (90°) cone. The number of blows required to drive the cone each 100mm increment into the sub soil is recorded in accordance with the standards. The dynamic probe provides no information regarding soil type or groundwater conditions.

The dynamic probe results can be used to analyse the strength of the soil strata encountered by the probe. 'Proceedings of the Trinity College Dublin Symposium of Field and Laboratory Testing of Soils for Foundations and Embankments' presents a paper by Foirbart that is most relevant to Irish soil conditions and within this paper the following equations were included:

Granular Soils: DPH N_{100} x 2.5 = SPT N value

Cohesive Soils: C_u = 15 x DPH N_{100} + 30 kN/m^2

These equations present a relationship between the probe N_{100} value and the SPT N value for granular soils and the undrained shear strength of cohesive soils.

At each location, undisturbed cylindrical mould samples were recovered to complete California Bearing Ratio tests in the laboratory. The results facilitate the designing of the access roads and associated areas and are completed to BS1377: 1990: Part 4, Clause 7 ‘Determination of California Bearing Ratio’.

The trial pit logs and photographs are presented in Appendix 1 with the dynamic probe results shown on the logs. The California Bearing Ratio tests are shown in Appendix 3 along with the geotechnical laboratory test data.

3.2. Soakaway Tests

Adjacent to the trial pits, soakaway tests were completed and logged by a SIL geotechnical engineer. BRE Special Digest 365 stipulates that the pit should be filled three times and that the final cycle is used to provide the infiltration rate. The time taken for the water level to fall from 75% volume to 25% volume is required to calculate the rate of infiltration. However, if the

water level does not fall at a steady rate, then the test is deemed to have failed and the area is unsuitable for storm water drainage.

The soakaway test results are presented in Appendix 2.

3.3. Surveying

Following completion of all the fieldworks, a survey of the exploratory hole locations was completed using a GeoMax GPS Rover. The data is supplied on each individual log and along with a site plan in Appendix 5.

4. Laboratory Testing

Geotechnical laboratory testing was completed on representative soil samples in accordance with BS 1377 (1990). Testing includes:

- 8 No. moisture contents
- 8 No. Atterberg limits
- 8 No. particle size distribution curves
- 8 No. pH, chloride and sulphate content

Environmental laboratory testing was completed by Eurofins Chemtest Ltd and consisted of the following:

- 8 No. Suite I analysis
- 8 No. loss on ignition

The geotechnical laboratory test results are presented in Appendix 3 with the environmental test results and waste classification report in Appendix 4.

5. Ground Conditions

5.1. Overburden

The natural ground conditions vary slightly across the site with the area to the south east of the site, TP04, TP05, TP07 and TP08, are dominated by cohesive light brown slightly sandy slightly gravelly silty CLAY with high cobble and low boulder content soils. The remaining trial pits, TP01, TP02, TP03 and TP06, are dominated by dark grey silty sandy GRAVEL with high cobble and boulder content.

The dynamic probe results generally recorded values of 4 or greater at 1.00mbgl and the values then increase steadily with depth.

5.2. Groundwater

Groundwater details in the trial pits during the fieldworks are noted on the logs in Appendix 1. No groundwater was recorded ingressing into the trial pits during the fieldworks period.

6. Recommendations and Conclusions

Please note the following caveats:

The recommendations given, and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between the exploratory hole locations or below the final level of excavation, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for adjacent unexpected conditions that have not been revealed by the exploratory holes. It is further recommended that all bearing surfaces when excavated should be inspected by a suitably qualified Engineer to verify the information given in this report.

Excavated surfaces in clay strata should be kept dry to avoid softening prior to foundation placement. Foundations should always be taken to a minimum depth of 0.50mBGL to avoid the effects of frost action and possible seasonal shrinkage/swelling.

If it is intended that on-site materials are to be used as fill, then the necessary laboratory testing should be specified by the Client to confirm the suitability. Also, relevant lab testing should be specified where stability of side slopes to excavations is a concern, or where contamination may be an issue.

6.1. Foundations

Due to the unknown depth of foundation and no longer-term groundwater information, this analysis assumes the groundwater will not influence the construction or performance of these foundations.

For analysis of bearing capacities from the dynamic probes, the N_{100} values are used as follows in cohesive soils. The undrained shear strength (C_u) is calculated using the N_{100} value as per the equation in Section 3.1. This can then be used in calculations to work out the ultimate bearing capacity (ULS) and when a factor of safety of 3 is applied, the allowable bearing capacity (ABC) can be provided.

In granular soils, the N_{100} value is used to correlate the SPT N-value. The SPT N-value can then be used to calculate the allowable bearing capacity, as per Terzaghi and Peck, using the correlation of SPT N-value x 10 = ABC.

The table below shows the allowable bearing capacities for N_{100} values 1 to 10 at 1.00mbgl.

N_{100} Value	Cohesive Soils			Granular Soils	
	C_u	ULS	ABC	SPT N-value	ABC
1	45	245	82	2.5	25
2	60	324	110	5	50
3	75	400	135	7.5	75
4	90	480	160	10	100
5	105	555	185	12.5	125
6	120	630	210	15	150
7	135	705	235	17.5	175
8	150	780	260	20	200
9	165	855	285	22.5	225
10	180	930	310	250	250

All capacities shown are in kN/m^2.

As stated above in Section 5.1., the probe values in the GRAVEL are generally 4 or greater at 1.00mbgl. The value of 4 indicates an allowable bearing capacity of $100kN/m^2$. Using the same value for the cohesive CLAY soils indicate an allowable bearing capacity of $160kN/m^2$. A suitably qualified Engineer should inspect the foundations prior to pouring and confirm that the soils are suitable for the foundation design.

The following assumptions were made as part of these analyses. If any of these assumptions are not in accordance with detailed design or observations made during construction these recommendations should be re-evaluated.

- The foundation is to be 1m wide.
- Foundations are to be constructed on a level formation of uniform material type (described above).
- All man-made or filled material is to be removed prior to construction.
- The bulk unit weight of the material in this stratum has a minimum density of $19kN/m^3$.

The trial pits indicate that excavations in the cohesive soils should be stable for a short while at least. However, inspection of temporary excavations at the time of excavation and at regular intervals should be completed to ensure that all slopes are stable. Temporary support should be used on any excavation that will be left open for an extended period.

6.2. Groundwater

The caveats below relating to interpretation of groundwater levels should be noted:
There is always considerable uncertainty as to the likely rates of water ingress into excavations in clayey soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water.

Furthermore, water levels noted on the borehole and trial pit logs do not generally give an accurate indication of the actual groundwater conditions as the borehole or trial pit is rarely left open for sufficient time for the water level to reach equilibrium.

Also, during boring procedures, a permeable stratum may have been sealed off by the borehole casing, or water may have been added to aid drilling. Therefore, an extended period of groundwater monitoring using any constructed standpipes is required to provide more accurate information regarding groundwater conditions. Finally, groundwater levels vary with time of year, rainfall, nearby construction and tides.

Pumping tests would be required to determine likely seepage rates and persistence into excavations taken below the groundwater level. Deep trial pits also aid estimation of seepage rates.

As discussed previously, no groundwater was recorded during the fieldworks period.

There is always considerable uncertainty as to the likely rates of water ingress into excavations in cohesive soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water. Therefore, based on this information at the exploratory hole locations to date, it is considered likely that any shallow ingress into natural ground excavations will be slow to medium.

If groundwater is encountered during excavations then mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

6.3. Pavement Design

The CBR test results in Appendix 3 indicate CBR values ranging from 1.2% to 6.2%.

The CBR samples were recovered from 0.50mbgl and inspection of the formation strata should be completed prior to construction of the pavement. Once the exact formation levels are finalised then additional in-situ testing could be completed to assist with the detailed pavement design.

6.4. Soakaway Tests

The permeability of the soils varies across the site depending on the soils encountered. The soakaway tests completed at CLAY dominated parts of the site, TP04, TP05, TP07 and TP08 recorded no infiltration and therefore, failed the specification. The BRE Digest stipulates that the pit should half empty within 24hrs, and extrapolation indicates this condition would not be satisfied. The test was terminated at the end of the first (of a possible three) fill/empty cycle since further testing would give even slower fall rates due to increased soil saturation. The unsuitability of the soils for soakaways is further suggested by the soil descriptions of the materials in this area of the site where the soakaway was completed, i.e., well compacted clay/silt soils.

The tests attempted at TP01, TP02, TP03 and TP06, encountered granular GRAVEL soils and these pits drained faster than it was possible to fill the pits. A full water bowser (1000 litres) was added to the pit following excavations and the water did not remain in the pit sufficiently long enough to measure the infiltration rates. Any planned soakaways should be located in these granular GRAVEL soils.

6.5. Contamination

Environmental testing was scheduled on eight samples and the results are shown in Appendix 4. For material to be removed from site, Suite I testing was carried out to determine if the material is hazardous or non-hazardous and then the leachate results were compared with the published waste acceptance limits of BS EN 12457-2 to determine whether the material on the site could be accepted as ‘inert material’ by an Irish landfill.

The Waste Classification report created using HazWasteOnline™ software shows that the material tested can be classified as non-hazardous material. Following this analysis of the solid test results, the leachate disposal suite results indicate that the soils tested would be able to be treated as Inert Waste.

Eight samples were tested but it cannot be discounted that any localised contamination may have been missed. Any MADE GROUND excavated on site should be stockpiled separately to natural soils to avoid any potential cross contamination of the soils. Additional testing of these soils may be requested by the individual landfill before acceptance and a testing regime designed by an environmental engineer would be recommended to satisfy the landfill.

6.6. Aggressive Ground Conditions

The chemical test results in Appendix 3 indicate a general pH value between 7.91 and 8.55, which is close to neutral and below the level of 9, therefore no special precautions are required.

The maximum value obtained for water soluble sulphate was 127mg/l as SO_3. The BRE Special Digest 1:2005 – '*Concrete in Aggressive Ground*' guidelines require SO_4 values and after conversion ($SO_4 = SO_3 \times 1.2$), the maximum value of 152mg/l shows Class 1 conditions and no special precautions are required.

Appendix 1

Trial Pit Logs and Photographs

Contract No: 5861	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP01**
Contract:	Gorey Hill	Easting:	713590.283	Date:	09/06/2021
Location:	Gorey, Co. Wexford	Northing:	659508.660	Excavator:	JCB 3CX
Client:	Gerard Gannon Properties	Elevation:	119.34	Logged By:	M. Kaliski
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.70 x 0.50 x 2.00	Scale:	1:30

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
		TOPSOIL.						2	
	0.30	Dark grey slightly silty sandy fine to coarse, angular to subangular GRAVEL of shale with high cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of shale (up to 300mm diameter).		119.0	119.04	0.50 0.50	ES ICBR	4 4 4 4 8	
0.5				118.5		1.00	B	11 12 12 14	
1.0								12	
1.5				118.0				12 12 12 10	
	2.00	Obstruction - possible boulders. **Pit terminated at 2.00m**		117.5	117.34			9 7 9 14 8	
2.0								14	
2.5				117.0				17 18 35	
3.0				116.5					
3.5				116.0					
4.0				115.5					
4.5				115.0					
5.0				114.5					
5.5				114.0					
				113.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possibl boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5861	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP02**
Contract:	Gorey Hill	Easting:	713669.183	Date:	09/06/2021
Location:	Gorey, Co. Wexford	Northing:	659466.412	Excavator:	JCB 3CX
Client:	Gerard Gannon Properties	Elevation:	109.53	Logged By:	M. Kaliski
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.10 x 0.50 x 1.80	Scale:	1:30

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.20	TOPSOIL.		109.0	109.33	0.50	ES	2	
	0.60	Soft brown slightly sandy slightly gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of shale. Cobbles are angular to subangular of shale.			108.93	0.50	ICBR	2	
1.0		Dark grey silty very sandy fine to coarse, angular to subangular GRAVEL of shale with high cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of shale (up to 300mm diameter).		108.5		1.00	B	3	
1.5	1.80	Obstruction - possible boulders.		108.0	107.73			4	
2.0		**Pit terminated at 1.80m**		107.5				3	
2.5				107.0				6	
3.0				106.5				7	
3.5				106.0				10	
4.0				105.5				12	
4.5				105.0				14	
5.0				104.5				10	
5.5				104.0				7	
								13	
								21	
								35	

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5861	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP03**
Contract:	Gorey Hill	Easting:	713493.341	Date:	09/06/2021
Location:	Gorey, Co. Wexford	Northing:	659306.428	Excavator:	JCB 3CX
Client:	Gerard Gannon Properties	Elevation:	119.73	Logged By:	M. Kaliski
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.50 x 0.50 x 2.00	Scale:	1:30

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.30	TOPSOIL.		119.5	119.43			0 1 2 3	
	0.50	Soft dark brown slightly sandy slightly gravelly silty CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of shale. Cobbles are angular to subangular of shale.			119.23	0.50 0.50	ES ICBR	2 2 1	
1.0		Dark grey silty sandy fine to coarse, angular to subangular GRAVEL of shale with high cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of shale (up to 300mm diameter).		119.0				3 3 4 4 5	
				118.5				4 4 6 5 9	
1.5				118.0		1.80	B	16 28 35	
2.0	2.00	Obstruction - possible boulders. **Pit terminated at 2.00m**			117.73				
2.5				117.5					
3.0				117.0					
3.5				116.5					
4.0				116.0					
4.5				115.5					
5.0				115.0					
5.5				114.5					
				114.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5861	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP04**
Contract:	Gorey Hill	Easting:	713601.218	Date:	09/06/2021
Location:	Gorey, Co. Wexford	Northing:	659341.982	Excavator:	JCB 3CX
Client:	Gerard Gannon Properties	Elevation:	110.17	Logged By:	M. Kaliski
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.90 x 0.50 x 3.00	Scale:	1:30

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.20	TOPSOIL.		110.0	109.97	0.50	ES	2 2 2 2 1 2 3	
		Firm becoming stiff light brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of shale. Cobbles and boulders are angular to subangular of shale (up to 400mm diameter).		109.5		0.50	ICBR	8 8 8 9 10 12 11 11	
1.0				109.0					
1.5						1.50	B	8	
				108.5				7 6 5 5 4	
2.0				108.0				5 4 6 6 5 5	
2.5				107.5				7 7 8 7 6 6 7 5	
3.0	3.00	**Pit terminated at 3.00m**			107.17	3.00	B		
3.5				107.0					
				106.5				6 7 7 8 7 8 7 6 7 7 7 7 6 7 6 7 7 8 8 8 8 8 7 10 35	
4.0									
4.5				106.0					
				105.5					
5.0				105.0					
5.5				104.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5861	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP05**
Contract:	Gorey Hill	Easting:	713680.205	Date:	09/06/2021
Location:	Gorey, Co. Wexford	Northing:	659326.329	Excavator:	JCB 3CX
Client:	Gerard Gannon Properties	Elevation:	103.76	Logged By:	M. Kaliski
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.80 x 0.50 x 3.00	Scale:	1:30

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
	0.10	TOPSOIL.			103.66			2	
		Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of shale. Cobbles are angular to subangular of shale.		103.5		0.50	ES	4	
0.5						0.50	ICBR	4	
				103.0				3	
								3	
								6	
								7	
								8	
								14	
1.0						1.00	B	8	
								12	
								12	
				102.5				15	
								12	
1.5								20	
								17	
								14	
				102.0				12	
								12	
								12	
2.0								12	
								11	
				101.5				11	
								10	
2.5								11	
								11	
	2.70				101.06			12	
		Stiff brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of shale. Cobbles and boulders are angular to subangular of shale (up to 400mm diameter).		101.0				10	
						2.90	B	11	
3.0	3.00				100.76			14	
								13	
								10	
				100.5				14	
								17	
3.5								14	
								17	
								14	
				100.0				13	
								15	
4.0								12	
								12	
								16	
				99.5				19	
								17	
4.5								15	
								23	
								26	
				99.0				35	
5.0									
				98.5					
5.5									
				98.0					

Pit terminated at 3.00m

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5861	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP06**
Contract:	Gorey Hill	Easting:	713441.485	Date:	09/06/2021
Location:	Gorey, Co. Wexford	Northing:	659188.458	Excavator:	JCB 3CX
Client:	Gerard Gannon Properties	Elevation:	116.30	Logged By:	M. Kaliski
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.50 x 0.50 x 2.40	Scale:	1:30

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
		TOPSOIL.			116.10			1	
	0.20	Firm light brown slightly sandy slightly gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of shale. Cobbles are angular to subangular of shale.		116.0		0.50 0.50	ES ICBR	2 3 4 3 2 3 4 5 6 6	
0.5									
1.0	1.10	Dark grey slightly silty sandy fine to coarse, angular to subangular GRAVEL of shale with high cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subangular of shale (up to 300mm diameter).		115.5	115.20			8 11 12 12	
1.5				115.0		1.50	B	14 14 16	
2.0				114.5				26 35	
	2.40	Obstruction - possible boulders. **Pit terminated at 2.40m**		114.0	113.90				
2.5									
3.0				113.5					
3.5				113.0					
4.0				112.5					
4.5				112.0					
5.0				111.5					
5.5				111.0					
				110.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5861	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP07**
Contract:	Gorey Hill	Easting:	713654.958	Date:	09/06/2021
Location:	Gorey, Co. Wexford	Northing:	659207.691	Excavator:	JCB 3CX
Client:	Gerard Gannon Properties	Elevation:	103.83	Logged By:	M. Kaliski
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.10 x 0.50 x 3.00	Scale:	1:30

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
	0.10	TOPSOIL.			103.73			2	
		Firm becoming stiff brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of shale. Cobbles are angular to subangular of shale.		103.5		0.50	ES	2	
0.5						0.50	ICBR	2	
								2	
								2	
								2	
								8	
				103.0				13	
								18	
1.0						1.00	B	24	
								20	
								18	
				102.5				17	
								17	
1.5								16	
								18	
								18	
				102.0				23	
								24	
2.0								35	
				101.5					
2.5									
	2.70				101.13				
		Stiff grey brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of shale. Cobbles and boulders are angular to subangular of shale (up to 400mm diameter).		101.0					
3.0	3.00				100.83	3.00	B		
		Pit terminated at 3.00m		100.5					
3.5									
				100.0					
4.0									
				99.5					
4.5									
				99.0					
5.0									
				98.5					
5.5									
				98.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5861	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP08**
Contract:	Gorey Hill	Easting:	713494.287	Date:	09/06/2021
Location:	Gorey, Co. Wexford	Northing:	659094.363	Excavator:	JCB 3CX
Client:	Gerard Gannon Properties	Elevation:	106.95	Logged By:	M. Kaliski
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.30 x 0.50 x 2.40	Scale:	1:30

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.20	TOPSOIL.		106.5	106.75	0.50	ES	2	
		Firm becoming stiff brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of shale. Cobbles are angular to subangular of shale.				0.50	ICBR	3 3 3 3 4 2 3 4	
1.0				106.0				7 7 5 5 8	
1.5				105.5		1.50	B	9 10 10 12	
2.0				105.0				35	
2.5	2.40	Obstruction - possible boulders. **Pit terminated at 2.40m**		104.5	104.55				
3.0				104.0					
3.5				103.5					
4.0				103.0					
4.5				102.5					
5.0				102.0					
5.5				101.5					
				101.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possible boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

TP01 Sidewall



TP01 Spoil



TP02 Sidewall



TP02 Spoil



TP03 Sidewall



TP03 Spoil



TP04 Sidewall



TP04 Spoil



TP05 Sidewall



TP05 Spoil



TP06 Sidewall



TP06 Spoil



TP07 Sidewall



TP07 Spoil



TP08 Sidewall



TP08 Spoil



Appendix 2

Soakaway Test Results

SOAKAWAY TEST

Project Reference:	5861
Contract name:	Gorey Hill
Location:	Gorey, Co. Wexford
Test No:	TP01
Date:	09/06/2021

Ground Conditions

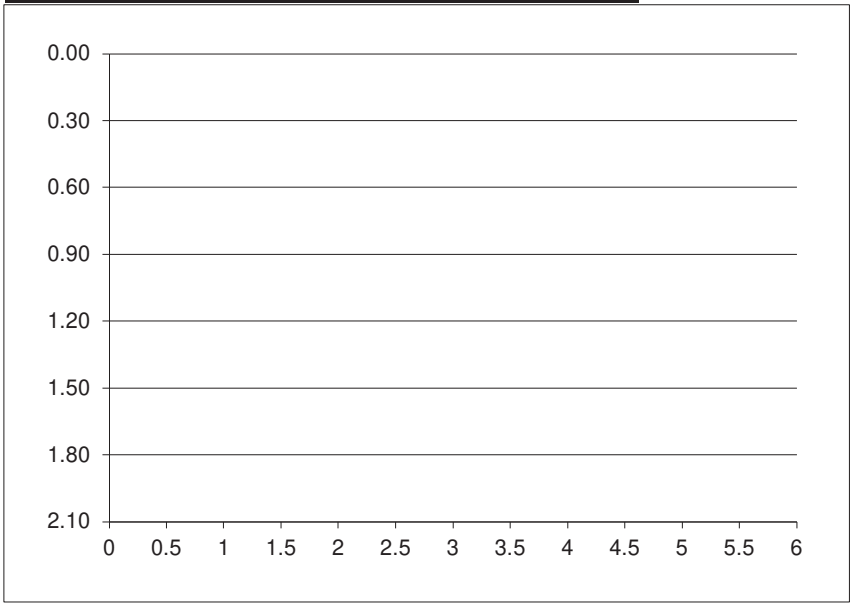
From	**To**	
0.00	0.30	TOPSOIL.
0.30	2.00	Dark grey slightly silty slightly sandy GRAVEL with high cobble and boulder content.
2.00		Obstruction - boulders.

Remarks:

Filled pit with 1000l - water level did not rise due to very high permeability of soils.

Elapsed Time (mins)	Fall of Water (m)
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

Pit Dimensions (m)		
Length (m)	2.70	m
Width (m)	0.50	m
Depth	2.00	m
Water		
Start Depth of Water	-	m
Depth of Water	-	m
75% Full	-	m
25% Full	-	m
75%-25%	-	m
Volume of water (75%-25%)	**-**	m3
Area of Drainage	**12.8**	m2
Area of Drainage (75%-25%)	**-**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **-** **m/min** or **-** **m/s**

SOAKAWAY TEST

Project Reference:	5861
Contract name:	Gorey Hill
Location:	Gorey, Co. Wexford
Test No:	TP02
Date:	09/06/2021

Ground Conditions

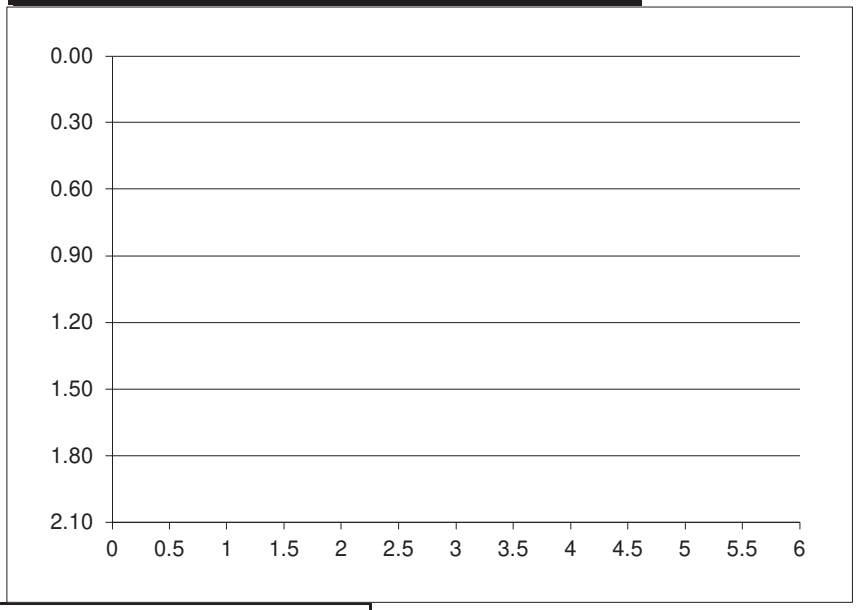
From	**To**	
0.00	0.20	TOPSOIL.
0.20	0.60	Soft brown slightly sandy slightly gravelly silty CLAY with low cobble content.
0.60	1.80	Dark grey slightly silty slightly sandy GRAVEL with high cobble and boulder content.
1.80		Obstruction - boulders or possible bedrock.

Remarks:

Filled pit with 1000l - water level did not rise due to very high permeability of soils.

Elapsed Time (mins)	Fall of Water (m)
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

Pit Dimensions (m)		
Length (m)	3.10	m
Width (m)	0.50	m
Depth	1.80	m
Water		
Start Depth of Water	-	m
Depth of Water	-	m
75% Full	-	m
25% Full	-	m
75%-25%	-	m
Volume of water (75%-25%)	**-**	m3
Area of Drainage	**12.96**	m2
Area of Drainage (75%-25%)	**-**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **-** **m/min** or **-** **m/s**

SOAKAWAY TEST

Project Reference:	5861
Contract name:	Gorey Hill
Location:	Gorey, Co. Wexford
Test No:	TP03
Date:	09/06/2021

Ground Conditions

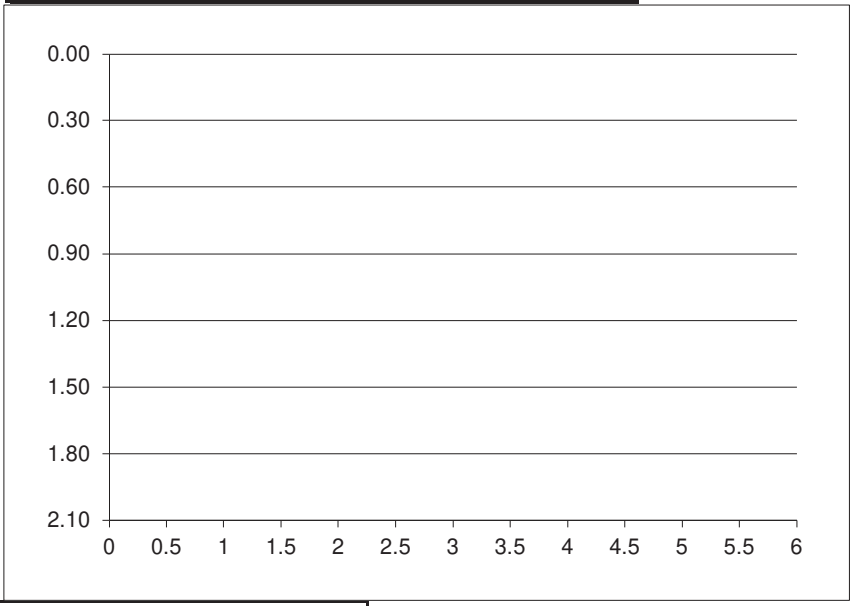
From	To	
0.00	0.30	TOPSOIL.
0.30	0.50	Soft brown slightly sandy slightly gravelly silty CLAY with medium cobble content.
0.50	2.00	Dark grey slightly silty slightly sandy GRAVEL with high cobble and boulder content.
2.00		Obstruction - boulders or possible bedrock.

Remarks:

Filled pit with 1000l - water level did not rise due to very high permeability of soils.

Elapsed Time (mins)	Fall of Water (m)
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

Pit Dimensions (m)		
Length (m)	2.50	m
Width (m)	0.50	m
Depth	2.00	m
Water		
Start Depth of Water	-	m
Depth of Water	-	m
75% Full	-	m
25% Full	-	m
75%-25%	-	m
Volume of water (75%-25%)	**-**	m3
Area of Drainage	**12.00**	m2
Area of Drainage (75%-25%)	**-**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **-** **m/min** or **-** **m/s**

SOAKAWAY TEST

Project Reference:	5861
Contract name:	Gorey Hill
Location:	Gorey, Co. Wexford
Test No:	TP04
Date:	09/06/2021

Ground Conditions

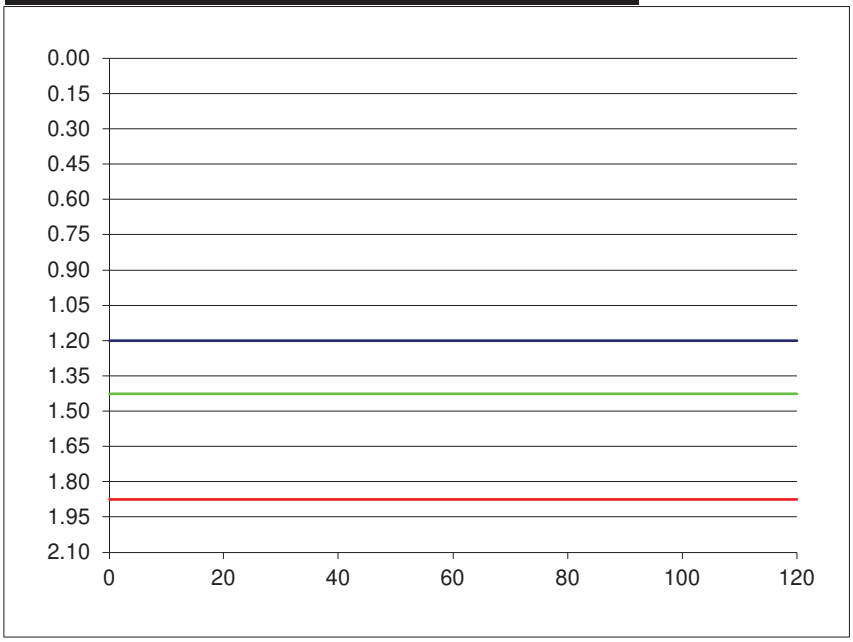
From	To	
0.00	0.20	TOPSOIL.
0.20	2.10	Firm becoming stiff light brown slightly sandy gravelly silty CLAY with high cobble and low boulder content.

Remarks:

Completed adjacent to TP04.

Elapsed Time (mins)	Fall of Water (m)
0	1.20
0.5	1.20
1	1.20
1.5	1.20
2	1.20
2.5	1.20
3	1.20
3.5	1.20
4	1.20
4.5	1.20
5	1.20
6	1.20
7	1.20
8	1.20
9	1.20
10	1.20
12	1.20
14	1.20
16	1.20
18	1.20
20	1.20
25	1.20
30	1.20
40	1.20
50	1.20
60	1.20
75	1.20
90	1.20
120	1.20

Pit Dimensions (m)		
Length (m)	2.90	m
Width (m)	0.50	m
Depth	2.10	m
Water		
Start Depth of Water	1.20	m
Depth of Water	0.90	m
75% Full	1.43	m
25% Full	1.88	m
75%-25%	0.45	m
Volume of water (75%-25%)	**0.65**	m3
Area of Drainage	**14.28**	m2
Area of Drainage (75%-25%)	**4.51**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** m/min or **Fail** m/s

SOAKAWAY TEST

Project Reference:	5861
Contract name:	Gorey Hill
Location:	Gorey, Co. Wexford
Test No:	TP05
Date:	09/06/2021

Ground Conditions

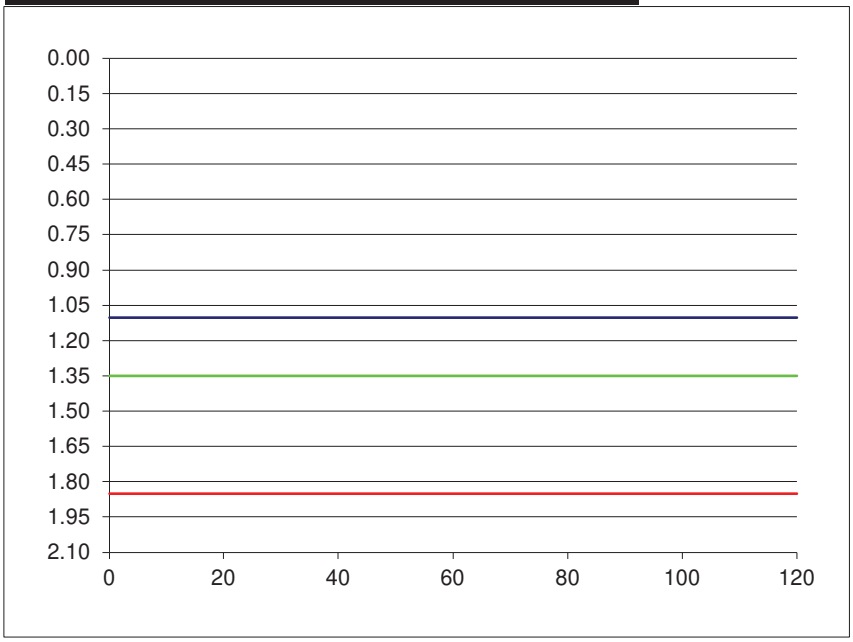
From	To	
0.00	0.20	TOPSOIL.
0.20	2.10	Firm becoming stiff light brown slightly sandy gravelly silty CLAY with high cobble and low boulder content.

Remarks:

Completed adjacent to TP05.

Elapsed Time (mins)	Fall of Water (m)
0	1.10
0.5	1.10
1	1.10
1.5	1.10
2	1.10
2.5	1.10
3	1.10
3.5	1.10
4	1.10
4.5	1.10
5	1.10
6	1.10
7	1.10
8	1.10
9	1.10
10	1.10
12	1.10
14	1.10
16	1.10
18	1.10
20	1.10
25	1.10
30	1.10
40	1.10
50	1.10
60	1.10
75	1.10
90	1.10
120	1.10

Pit Dimensions (m)		
Length (m)	2.90	m
Width (m)	0.50	m
Depth	2.10	m
Water		
Start Depth of Water	1.10	m
Depth of Water	1.00	m
75% Full	1.35	m
25% Full	1.85	m
75%-25%	0.50	m
Volume of water (75%-25%)	**0.73**	m3
Area of Drainage	**14.28**	m2
Area of Drainage (75%-25%)	**4.85**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** **m/min** or **Fail** **m/s**

SOAKAWAY TEST

Project Reference:	5861
Contract name:	Gorey Hill
Location:	Gorey, Co. Wexford
Test No:	TP06
Date:	09/06/2021

Ground Conditions

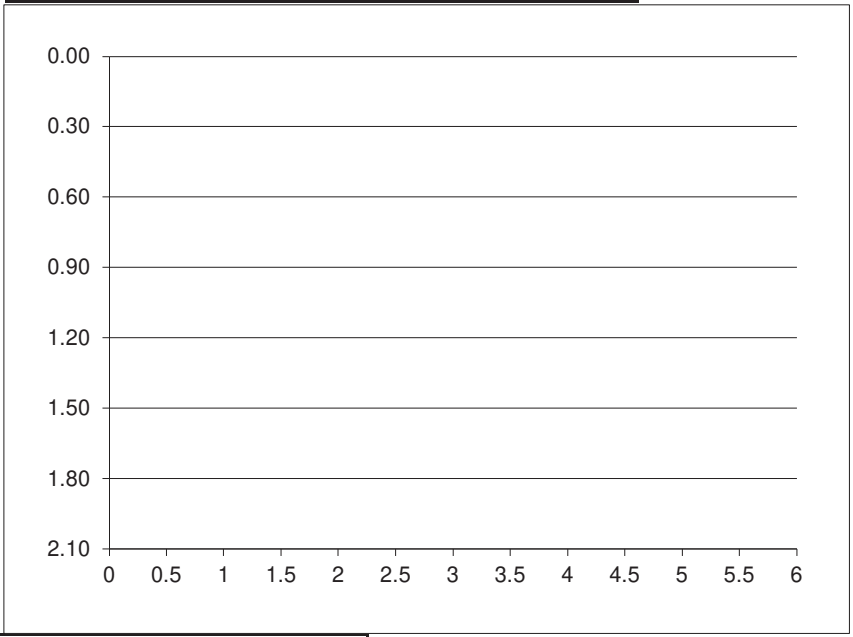
From	**To**	
0.00	0.20	TOPSOIL.
0.20	1.10	Firm light brown slightly sandy slightly gravelly silty CLAY with low cobble content.
1.10	2.10	Dark grey slightly silty slightly sandy GRAVEL with high cobble and boulder content.

Remarks:

Filled pit with 1000l - water level did not rise due to very high permeability of soils.

Elapsed Time (mins)	Fall of Water (m)
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

Pit Dimensions (m)		
Length (m)	2.50	m
Width (m)	0.50	m
Depth	2.10	m
Water		
Start Depth of Water	-	m
Depth of Water	-	m
75% Full	-	m
25% Full	-	m
75%-25%	-	m
Volume of water (75%-25%)	**-**	m3
Area of Drainage	**12.60**	m2
Area of Drainage (75%-25%)	**-**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **-** **m/min** or **-** **m/s**

SOAKAWAY TEST

Project Reference:	5861
Contract name:	Gorey Hill
Location:	Gorey, Co. Wexford
Test No:	TP07
Date:	09/06/2021

Ground Conditions

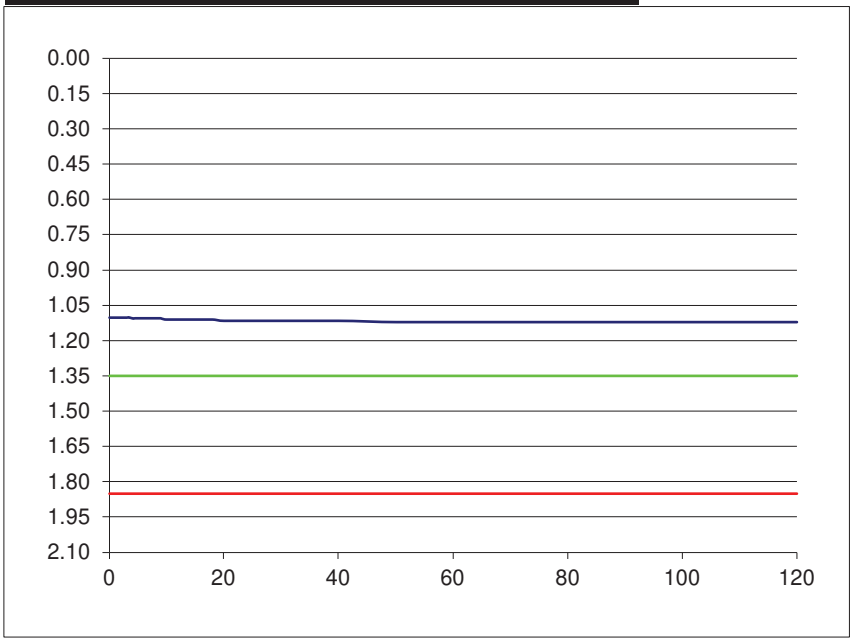
From	To	
0.00	0.10	TOPSOIL.
0.10	2.10	Firm becoming stiff brown slightly sandy gravelly silty CLAY with low cobble content.

Remarks:

Completed adjacent to TP07.

Elapsed Time (mins)	Fall of Water (m)
0	1.10
0.5	1.10
1	1.10
1.5	1.10
2	1.10
2.5	1.10
3	1.10
3.5	1.10
4	1.11
4.5	1.11
5	1.11
6	1.11
7	1.11
8	1.11
9	1.11
10	1.11
12	1.11
14	1.11
16	1.11
18	1.11
20	1.12
25	1.12
30	1.12
40	1.12
50	1.12
60	1.12
75	1.12
90	1.12
120	1.12

Pit Dimensions (m)		
Length (m)	3.00	m
Width (m)	0.50	m
Depth	2.10	m
Water		
Start Depth of Water	1.10	m
Depth of Water	1.00	m
75% Full	1.35	m
25% Full	1.85	m
75%-25%	0.50	m
Volume of water (75%-25%)	**0.75**	m3
Area of Drainage	**14.70**	m2
Area of Drainage (75%-25%)	**5.00**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** **m/min** or **Fail** **m/s**

SOAKAWAY TEST

Project Reference:	5861
Contract name:	Gorey Hill
Location:	Gorey, Co. Wexford
Test No:	TP08
Date:	09/06/2021

Ground Conditions

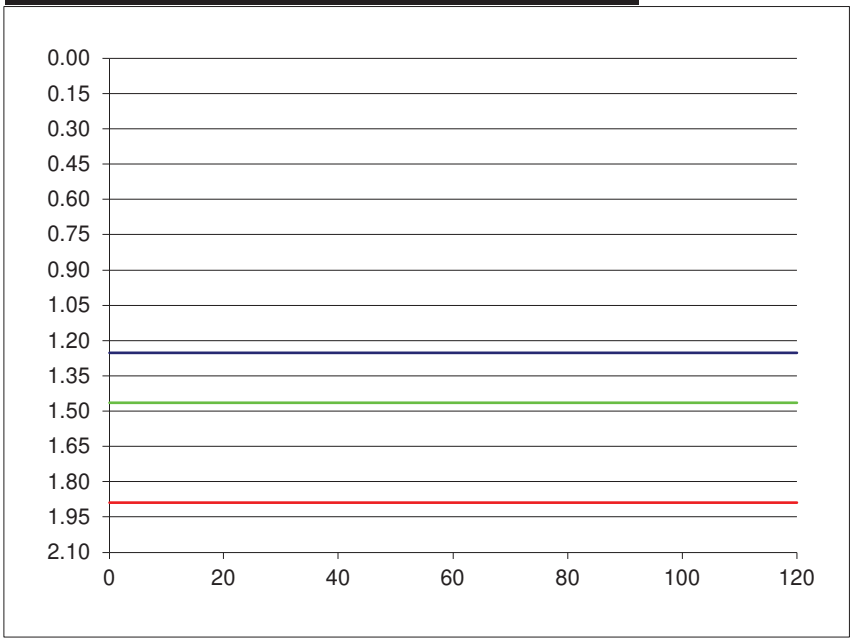
From	To	
0.00	0.20	TOPSOIL.
0.20	2.10	Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with low cobble content.

Remarks:

Completed adjacent to TP08.

Elapsed Time (mins)	Fall of Water (m)
0	1.25
0.5	1.25
1	1.25
1.5	1.25
2	1.25
2.5	1.25
3	1.25
3.5	1.25
4	1.25
4.5	1.25
5	1.25
6	1.25
7	1.25
8	1.25
9	1.25
10	1.25
12	1.25
14	1.25
16	1.25
18	1.25
20	1.25
25	1.25
30	1.25
40	1.25
50	1.25
60	1.25
75	1.25
90	1.25
120	1.25

Pit Dimensions (m)		
Length (m)	3.00	m
Width (m)	0.50	m
Depth	2.10	m
Water		
Start Depth of Water	1.25	m
Depth of Water	0.85	m
75% Full	1.46	m
25% Full	1.89	m
75%-25%	0.43	m
Volume of water (75%-25%)	**0.64**	m3
Area of Drainage	**14.70**	m2
Area of Drainage (75%-25%)	**4.48**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** m/min or **Fail** m/s

Appendix 3

Geotechnical Laboratory Test Results

Classification Tests in accordance with BS1377: Part 4

Client	Gerard Gannon Properties Ltd.
Site	Gorey Hill, Gorey
S.I. File No	5851 / 21
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	21st June 2021

Hole ID	Depth	Sample No	Lab Ref No.	Sample Type	Natural Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index %	Min. Dry Density Mg/m^3	Particle Density Mg/m^3	% passing 425um	Comments	**Remarks** **C**=Clay; **M**=Silt **Plasticity**: **L**=Low; **I**=Intermediate; **H**=High; **V**=Very High; **E**=Extremely High
TP01	1.00	MK27	21/598	B	8.9	32	18	14			8.5		CL
TP02	1.00	MK03	21/600	B	11.0	30	18	12			18.2		CL
TP03	1.80	MK24	21/602	B	11.7	33	19	14			15.3		CL
TP04	1.50	MK14	21/604	B	12.1	32	20	12			44.6		CL
TP05	1.00	MK06	21/606	B	14.8	33	18	15			53.6		CL
TP06	1.50	MK21	21/608	B	9.1	32	21	11			6.8		CL
TP07	1.00	MK10	21/610	B	12.6	31	19	12			49.3		CL
TP08	1.50	MK18	21/612	B	11.8	35	20	15			46.0		CL/CI

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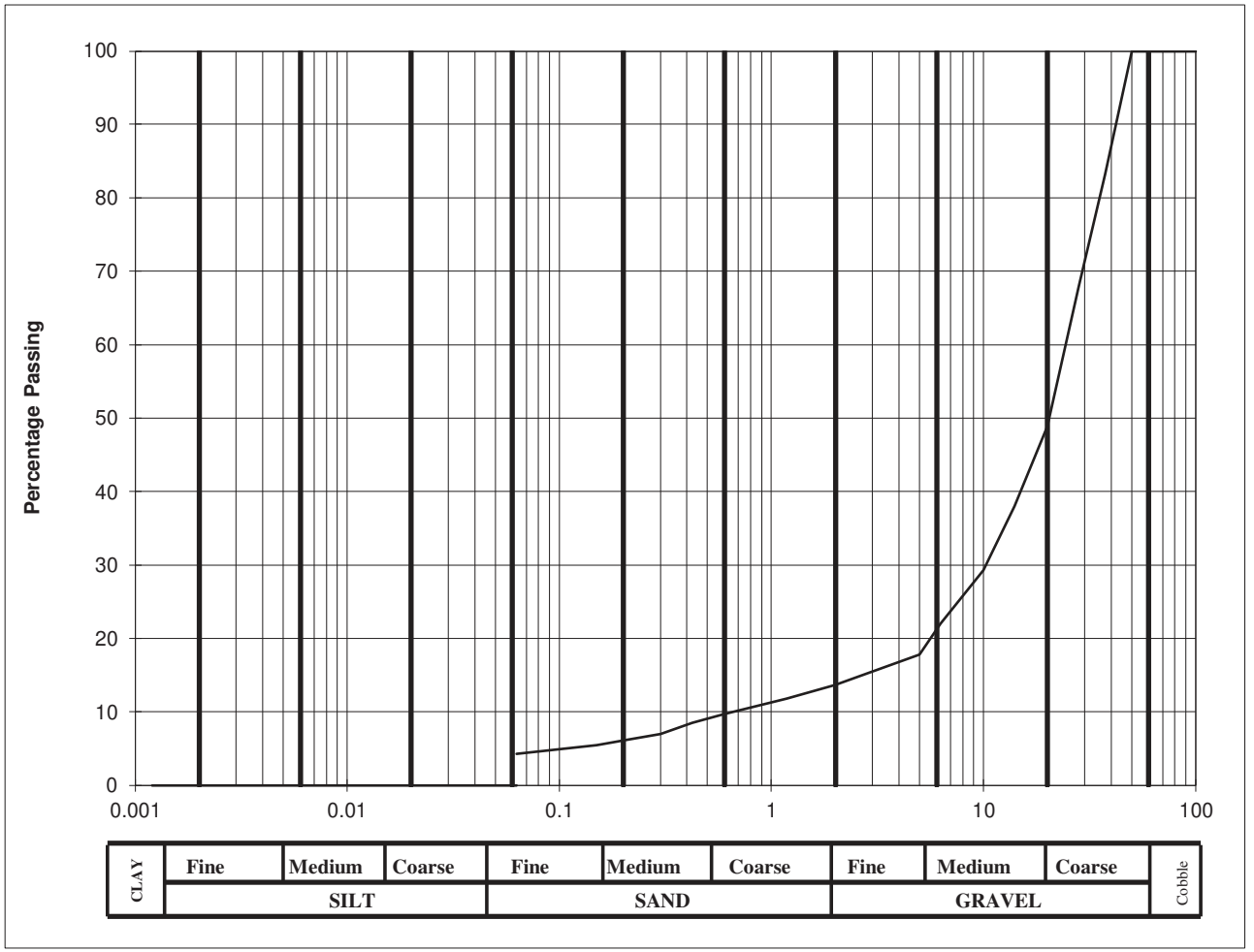
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	83.2		
28	67.7		
20	48.9		
14	38		
10	29.3		
6.3	22		
5.0	17.8		
2.36	14.4		
2.00	13.7		
1.18	11.8		
0.600	9.7		
0.425	8.5		
0.300	7		
0.212	6.2		
0.150	5.5		
0.063	4		

Cobbles, %	0
Gravel, %	86
Sand, %	10
Clay / Silt, %	4



Client :	Gerard Gannon Properties Ltd.
Project :	Gorey Hill, Gorey

Lab. No :	21/598
Sample No :	MK27

Hole ID :	TP 01
Depth, m :	1.00

Material description :	slightly silty sandy GRAVEL
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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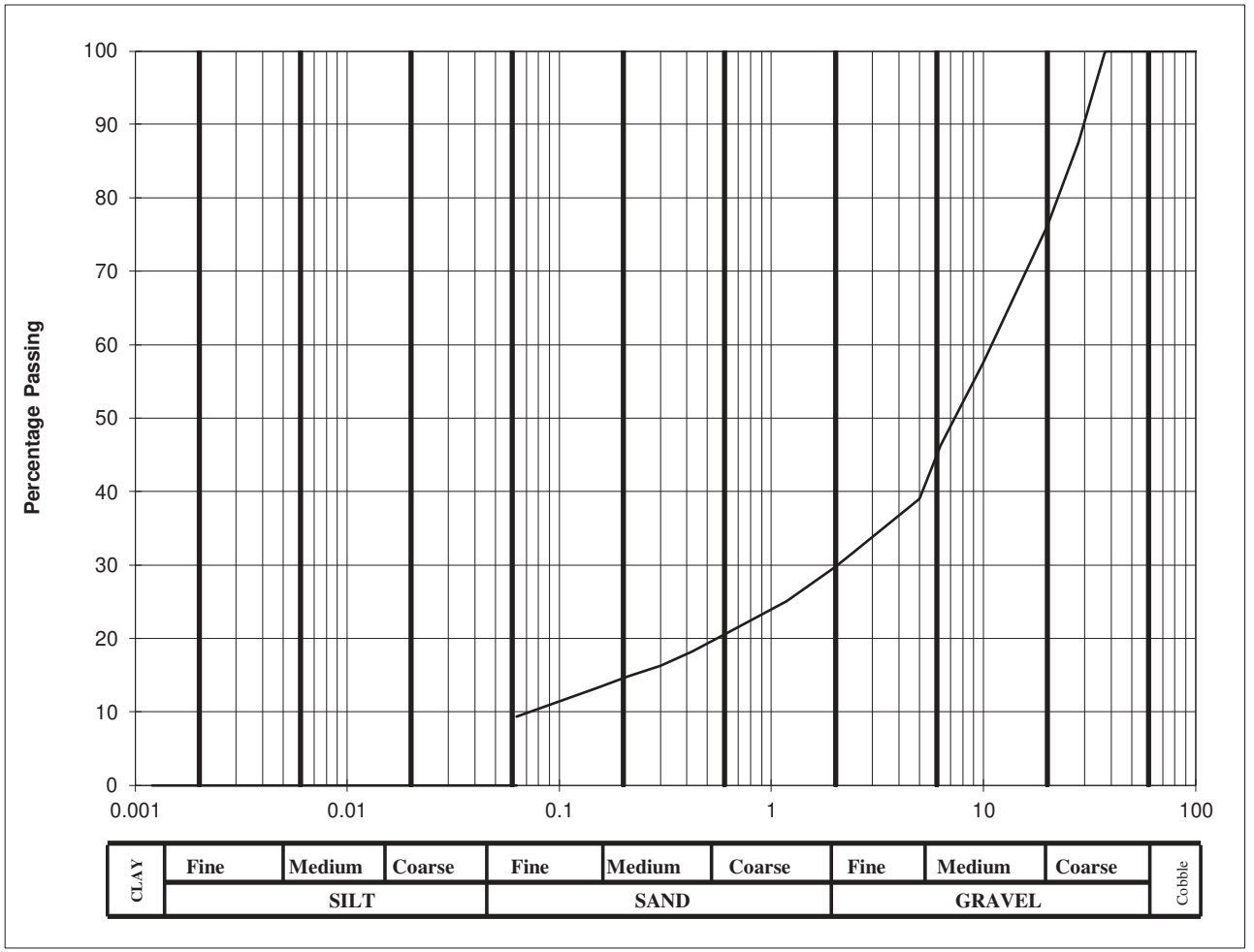
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	87.5		
20	76.2		
14	66.6		
10	57.6		
6.3	46.3		
5.0	39		
2.36	31.4		
2.00	29.7		
1.18	25.1		
0.600	20.5		
0.425	18.2		
0.300	16.3		
0.212	14.8		
0.150	13.2		
0.063	9		

Cobbles, %	0
Gravel, %	70
Sand, %	21
Clay / Silt, %	9



Client :	Gerard Gannon Properties Ltd.
Project :	Gorey Hill, Gorey

Lab. No :	21/600
Sample No :	MK03

Hole ID :	TP 02
Depth, m :	1.00

Material description :	silty very sandy GRAVEL
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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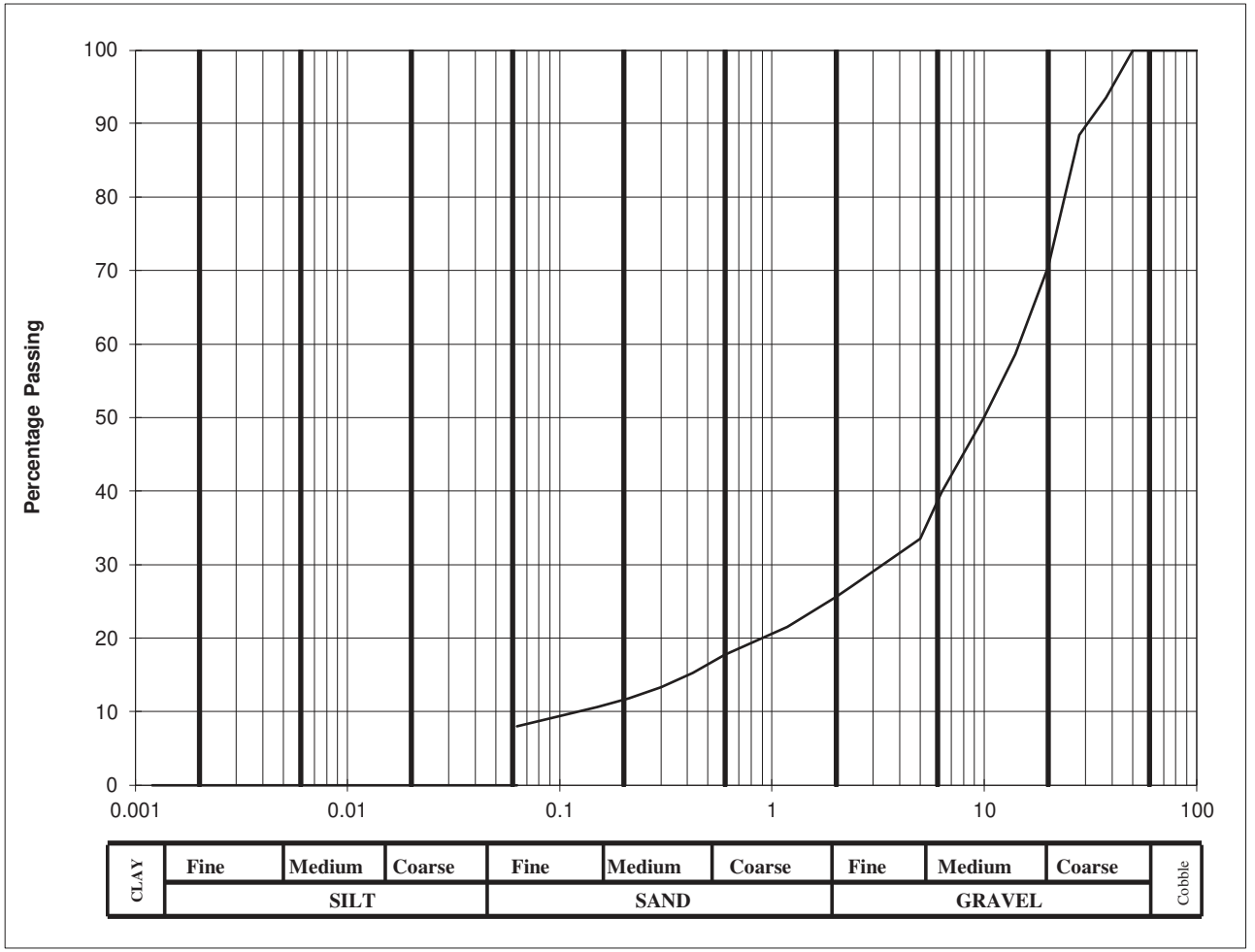
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	93.5		
28	88.4		
20	70.5		
14	58.6		
10	50.1		
6.3	39.8		
5.0	33.5		
2.36	27		
2.00	25.6		
1.18	21.5		
0.600	17.7		
0.425	15.3		
0.300	13.3		
0.212	11.8		
0.150	10.6		
0.063	8		

Cobbles, %	0
Gravel, %	74
Sand, %	18
Clay / Silt, %	8



Client :	Gerard Gannon Properties Ltd.
Project :	Gorey Hill, Gorey

Lab. No :	21/602
Sample No :	MK24

Hole ID :	TP 03
Depth, m :	1.80

Material description :	silty sandy GRAVEL
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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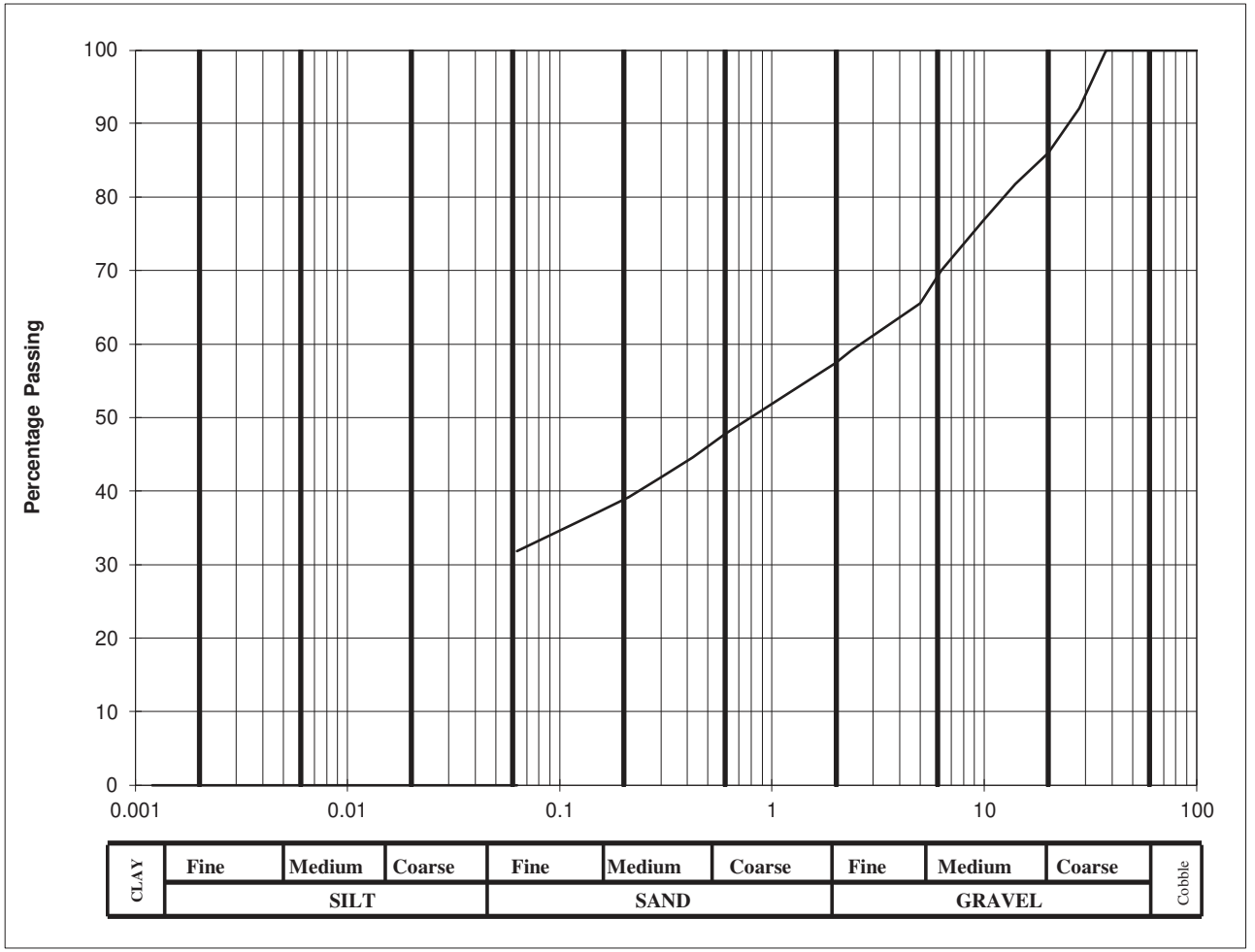
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	92.1		
20	86		
14	81.8		
10	76.9		
6.3	70		
5.0	65.5		
2.36	59.1		
2.00	57.4		
1.18	53.2		
0.600	47.7		
0.425	44.6		
0.300	41.9		
0.212	39.2		
0.150	37.1		
0.063	32		

Cobbles, %	0
Gravel, %	43
Sand, %	25
Clay / Silt, %	32



Client :	Gerard Gannon Properties Ltd.
Project :	Gorey Hill, Gorey

Lab. No :	21/604
Sample No :	MK14

Hole ID :	TP 04
Depth, m :	1.50

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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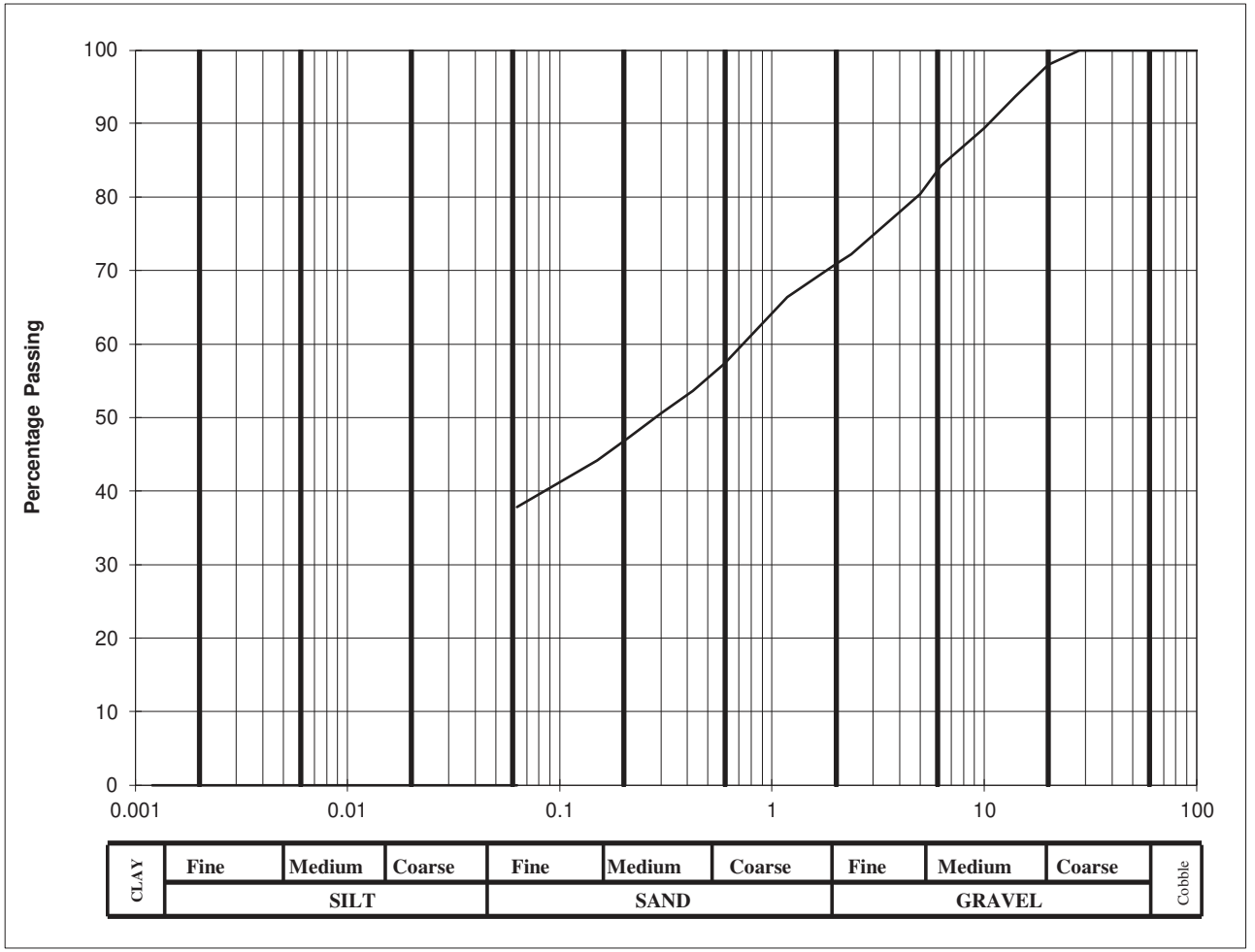
BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	98		
14	93.7		
10	89.4		
6.3	84.3		
5.0	80.4		
2.36	72.2		
2.00	70.9		
1.18	66.4		
0.600	57.3		
0.425	53.6		
0.300	50.6		
0.212	47.3		
0.150	44.2		
0.063	38		

Cobbles, %	0
Gravel, %	29
Sand, %	33
Clay / Silt, %	38



Client :	Gerard Gannon Properties Ltd.	Lab. No :	21/606	Hole ID :	TP 05
Project :	Gorey Hill, Gorey	Sample No :	MK06	Depth, m :	1.00

Material description :	slightly sandy slightly gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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BS 1377 Particle Size Analysis

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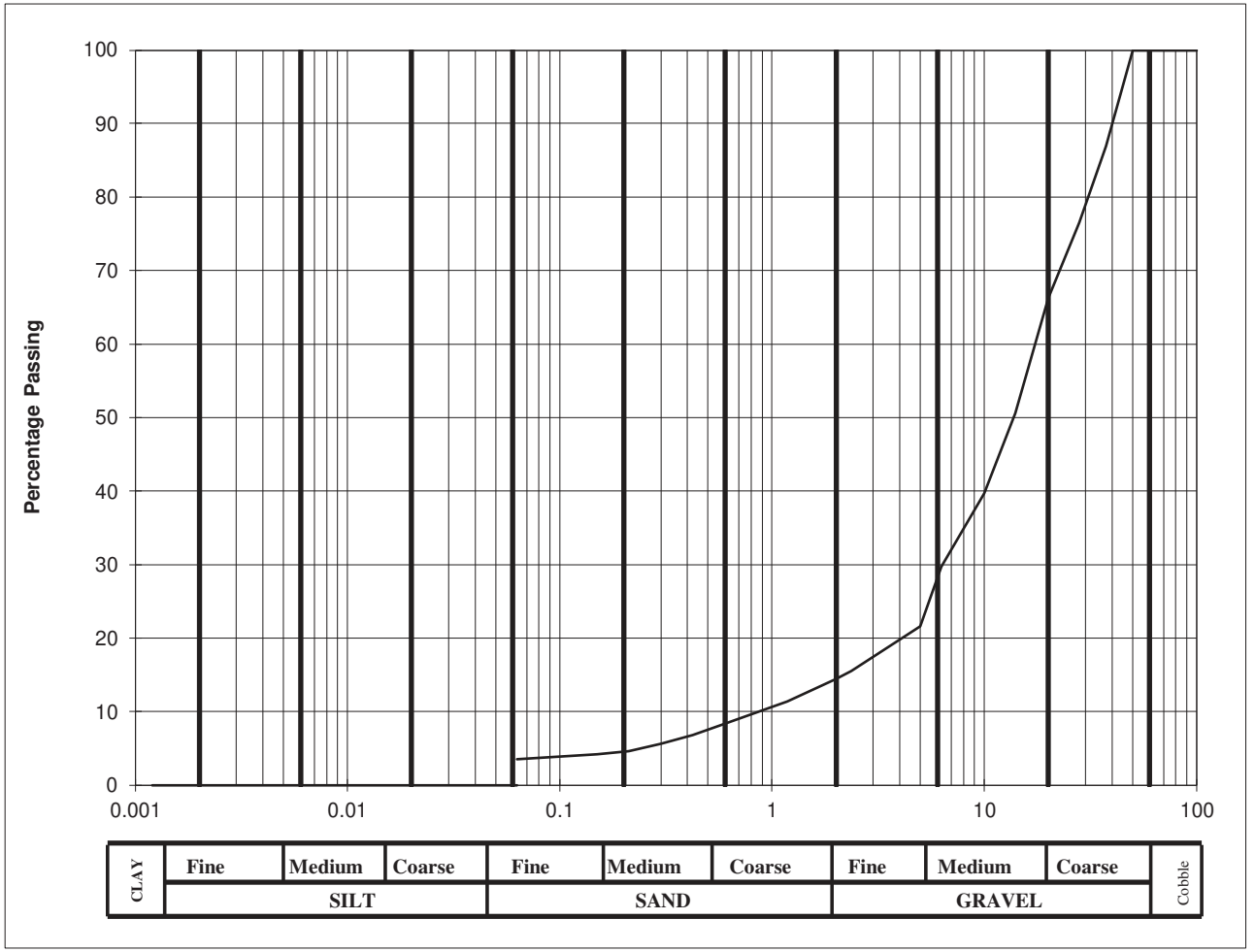
BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	86.9		
28	76.5		
20	66.2		
14	50.6		
10	39.7		
6.3	29.7		
5.0	21.6		
2.36	15.5		
2.00	14.4		
1.18	11.4		
0.600	8.3		
0.425	6.8		
0.300	5.6		
0.212	4.6		
0.150	4.2		
0.063	4		

Cobbles, %	0
Gravel, %	86
Sand, %	10
Clay / Silt, %	4



Client :	Gerard Gannon Properties Ltd.
Project :	Gorey Hill, Gorey

Lab. No :	21/608
Sample No :	MK21

Hole ID :	TP 06
Depth, m :	1.50

Material description :	slightly silty sandy GRAVEL
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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BS 1377 Particle Size Analysis

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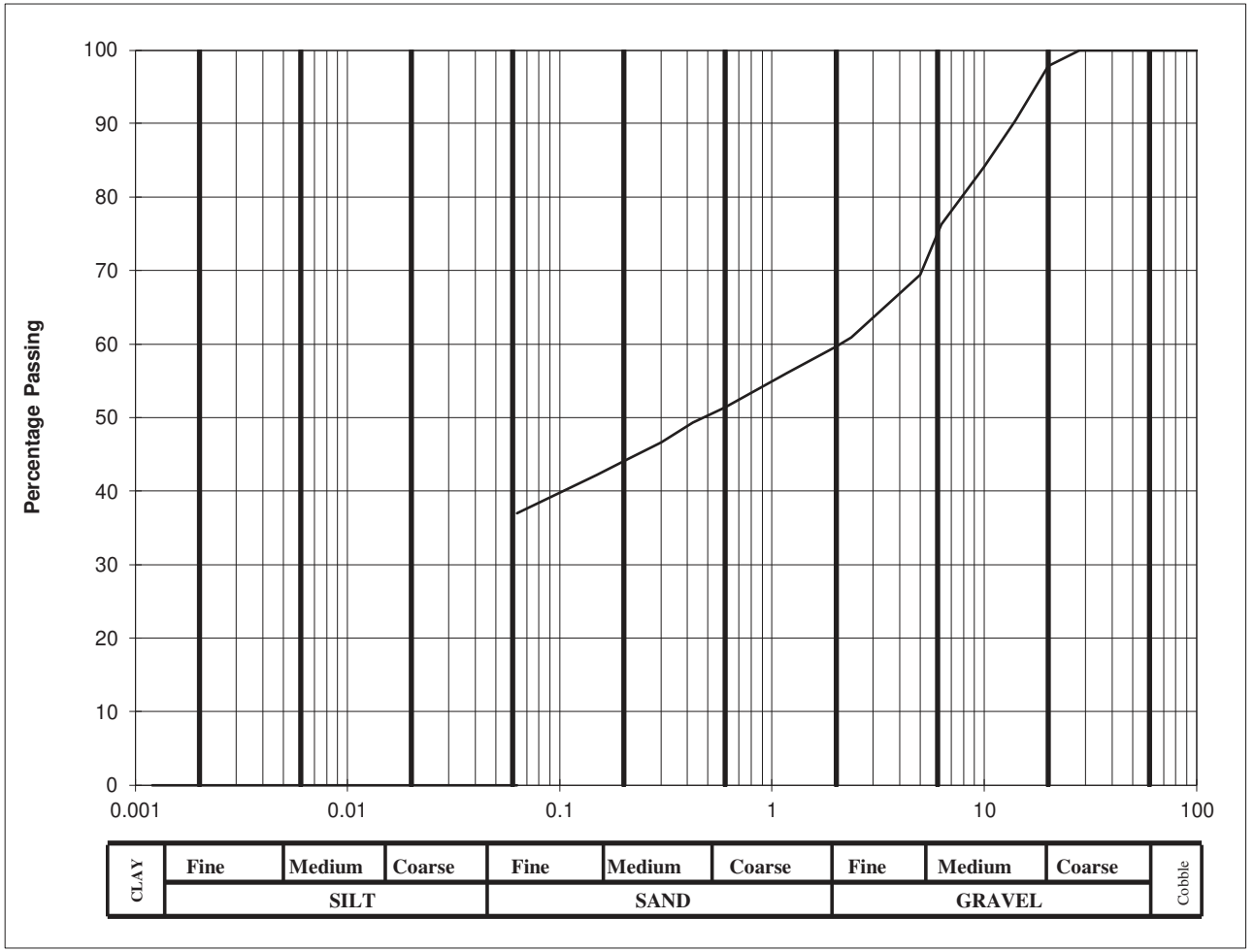
BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	97.8		
14	90.4		
10	84.1		
6.3	76.3		
5.0	69.4		
2.36	60.9		
2.00	59.6		
1.18	56.1		
0.600	51.3		
0.425	49.3		
0.300	46.6		
0.212	44.4		
0.150	42.2		
0.063	37		

Cobbles, %	0
Gravel, %	40
Sand, %	23
Clay / Silt, %	37



Client :	Gerard Gannon Properties Ltd.
Project :	Gorey Hill, Gorey

Lab. No :	21/610
Sample No :	MK10

Hole ID :	TP 07
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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BS 1377 Particle Size Analysis

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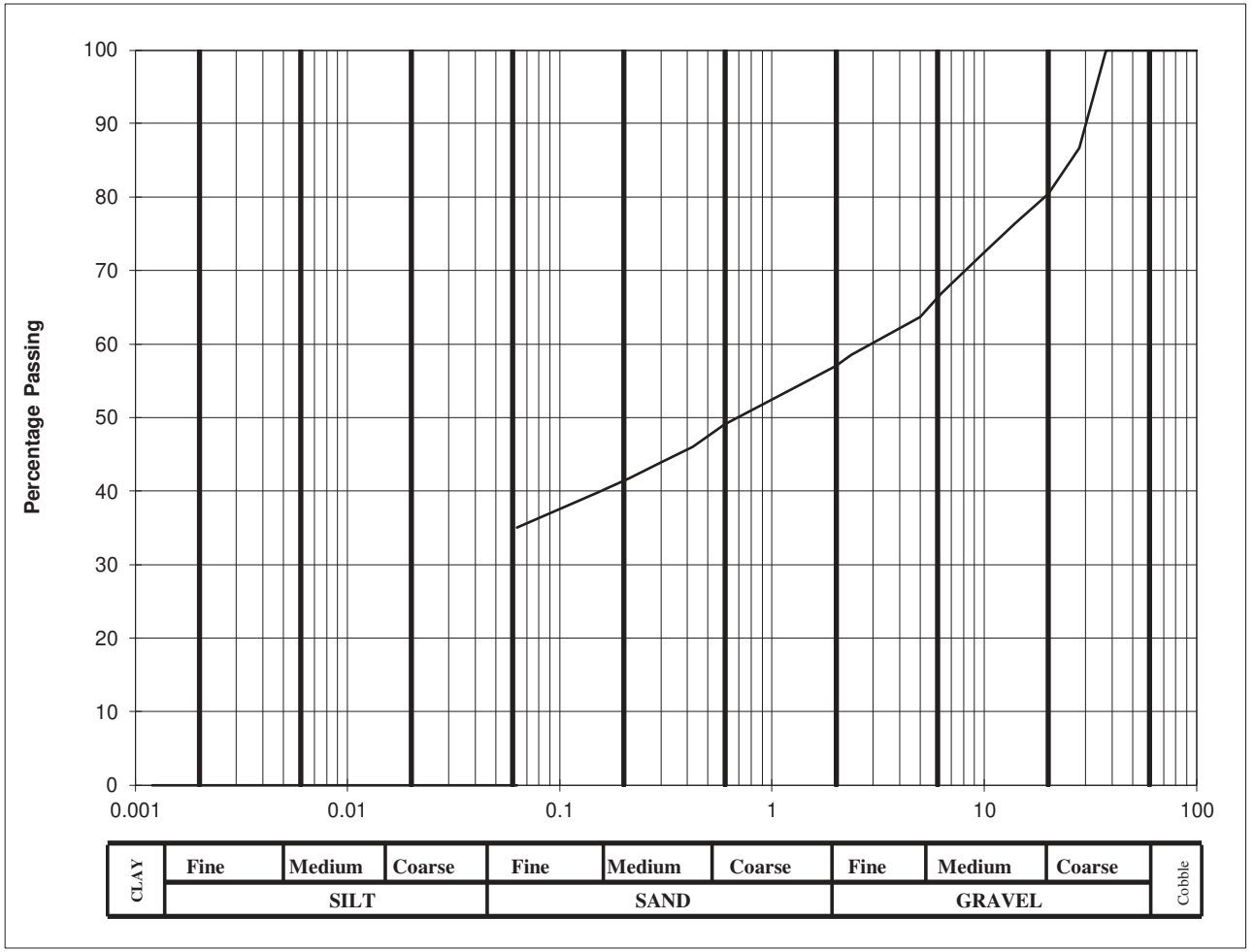
BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	86.7		
20	80.4		
14	76.4		
10	72.5		
6.3	66.9		
5.0	63.7		
2.36	58.5		
2.00	57		
1.18	53.5		
0.600	49.1		
0.425	46		
0.300	43.9		
0.212	41.7		
0.150	39.8		
0.063	35		

Cobbles, %	0
Gravel, %	43
Sand, %	22
Clay / Silt, %	35



Client :	Gerard Gannon Properties Ltd.
Project :	Gorey Hill, Gorey

Lab. No :	21/612
Sample No :	MK18

Hole ID :	TP 08
Depth, m :	1.50

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

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California Bearing Ratio (CBR) In accordance with BS1377: Part 4: Method 7

Client	Gerard Gannon Properties Ltd.
Site	Gorey Hill, Gorey
S.I. File No	5651 / 21
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	21st June 2021

CBR No	Depth (mBGL)	Sample No	Sample Type	Lab Ref	Moisture Content (%)	CBR Value (%)	Location / Remarks
TP01	0.50	MK26	CBR	21/597	11.1	9.4	
TP02	0.50	MK02	CBR	21/599	17.9	7.8	
TP03	0.50	MK23	CBR	21/601	13.2	6.4	
TP04	0.50	MK13	CBR	21/603	14.8	7.1	
TP05	0.50	MK05	CBR	21/605	13.0	5.9	
TP06	0.50	MK20	CBR	21/607	10.3	6.3	
TP07	0.50	MK09	CBR	21/609	19.8	6.5	
TP08	0.50	MK17	CBR	21/611	13.6	7.1	

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Chemical Testing
In accordance with BS 1377: Part 3

Client	Gerard Gannon Properties Ltd.
Site	Gorey Hill, Gorey
S.I. File No	5851 / 21
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	21st June 2021

Hole Id	Depth (mBGL)	Sample No	Lab Ref	pH Value	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO_3) g/L	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO_3) %	Loss on Ignition (Organic Content) %	Chloride ion Content (water:soil ratio 2:1) %	% passing 2mm	Remarks
TP01	1.00	MK27	21/598	7.95	0.122	0.017		0.19	13.7	
TP02	1.00	MK03	21/600	8.55	0.123	0.038		0.21	29.7	
TP03	1.80	MK24	21/602	8.11	0.117	0.030		0.22	25.6	
TP04	1.50	MK14	21/604	8.37	0.122	0.070		0.28	57.4	
TP05	1.00	MK06	21/606	8.32	0.127	0.090		0.29	70.9	
TP06	1.50	MK21	21/608	7.91	0.116	0.017		0.17	14.4	
TP07	1.00	MK10	21/610	8.24	0.116	0.070		0.26	59.6	
TP08	1.50	MK18	21/612	8.36	0.126	0.072		0.25	57.0	

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Appendix 4
Environmental Laboratory Test Results
And Waste Classification Report

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	21-20096-1
Initial Date of Issue:	21-Jun-2021
Client	Site Investigations Ltd
Client Address:	The Grange12th, Lock Road Lucan Co Dublin IRELAND
Contact(s):	Stephen Letch
Project	5861 Gorey Hill, Gorey
Quotation No.:	
Order No.:	32/A/21
No. of Samples:	8
Turnaround (Wkdays):	5
Date Approved:	21-Jun-2021
Approved By:	
Details:	Glynn Harvey, Technical Manager

Date Received:	14-Jun-2021
Date Instructed:	14-Jun-2021
Results Due:	18-Jun-2021

Results - Leachate

Project: 5861 Gorey Hill, Gorey

Client: Site Investigations Ltd						**Chemtest Job No.:**	21-20096	21-20096	21-20096	21-20096	21-20096	21-20096	21-20096
Quotation No.:						**Chemtest Sample ID.:**	1220385	1220386	1220387	1220388	1220389	1220390	1220391	1220392
Order No.: 32/A/21						Client Sample Ref.:	TP01	TP02	TP03	TP04	TP05	TP06	TP07	TP08
						Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
						Top Depth (m):	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
						Bottom Depth (m):	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
						Date Sampled:	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**									
Ammonium	U	1220	10:1	mg/l	0.050		0.16	0.17	0.16	0.15	0.10	0.15	0.14	0.14
Ammonium	N	1220	10:1	mg/kg	0.10		1.9	2.0	1.7	1.6	1.1	1.5	1.5	1.4

Results - Soil

Project: 5861 Gorey Hill, Gorey

Client: Site Investigations Ltd			**Chemtest Job No.:**		21-20096	21-20096	21-20096	21-20096	21-20096	21-20096	21-20096	21-20096
Quotation No.:			**Chemtest Sample ID.:**		1220385	1220386	1220387	1220388	1220389	1220390	1220391	1220392
Order No.: 32/A/21			Client Sample Ref.:		TP01	TP02	TP03	TP04	TP05	TP06	TP07	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
			Bottom Depth (m):		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
			Date Sampled:		11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	12	21	16	13	12	11	22	12
pH	M	2010		4.0	7.1	6.5	7.1	7.1	7.3	7.3	7.3	7.6
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40	0.46	< 0.40	< 0.40	< 0.40	< 0.40	0.83	0.57
Sulphur (Elemental)	M	2180	mg/kg	1.0	1.1	1.2	< 1.0	< 1.0	< 1.0	< 1.0	1.1	1.2
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	0.80	0.50	1.0	0.60	0.50	0.70	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	< 0.50	< 0.50	0.67	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Total)	M	2430	%	0.010	0.081	0.096	0.067	0.061	0.016	0.022	0.058	0.023
Arsenic	M	2450	mg/kg	1.0	37	59	52	40	47	36	31	32
Barium	M	2450	mg/kg	10	42	97	80	57	42	48	48	39
Cadmium	M	2450	mg/kg	0.10	0.15	0.32	0.18	0.16	< 0.10	0.11	0.11	< 0.10
Chromium	M	2450	mg/kg	1.0	30	59	50	53	41	45	43	36
Molybdenum	M	2450	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Antimony	N	2450	mg/kg	2.0	< 2.0	3.1	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Copper	M	2450	mg/kg	0.50	32	50	39	40	34	37	33	35
Mercury	M	2450	mg/kg	0.10	< 0.10	0.16	0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	33	50	48	54	37	50	42	39
Lead	M	2450	mg/kg	0.50	33	61	38	40	23	26	22	17
Selenium	M	2450	mg/kg	0.20	0.80	1.3	1.4	1.1	0.23	0.67	1.0	0.37
Zinc	M	2450	mg/kg	0.50	70	150	120	120	75	97	87	71
Chromium (Trivalent)	N	2490	mg/kg	1.0	30	59	50	53	41	45	43	36
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	1.5	2.4	1.3	< 0.20	< 0.20	< 0.20	1.3	0.38
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: 5861 Gorey Hill, Gorey

Client: Site Investigations Ltd			**Chemtest Job No.:**		21-20096	21-20096	21-20096	21-20096	21-20096	21-20096	21-20096	21-20096
Quotation No.:			**Chemtest Sample ID.:**		1220385	1220386	1220387	1220388	1220389	1220390	1220391	1220392
Order No.: 32/A/21			Client Sample Ref.:		TP01	TP02	TP03	TP04	TP05	TP06	TP07	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
			Bottom Depth (m):		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
			Date Sampled:		11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Coronene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 17 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

Results - Soil

Project: 5861 Gorey Hill, Gorey

Client: Site Investigations Ltd					**Chemtest Job No.:**	21-20096	21-20096	21-20096	21-20096	21-20096	21-20096	21-20096
Quotation No.:					**Chemtest Sample ID.:**	1220385	1220386	1220387	1220388	1220389	1220390	1220391	1220392
Order No.: 32/A/21					Client Sample Ref.:	TP01	TP02	TP03	TP04	TP05	TP06	TP07	TP08
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
					Bottom Depth (m):	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
					Date Sampled:	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021	11-Jun-2021
					Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Phenols	M	2920	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.50	< 0.10

Results - Single Stage WAC

Project: 5861 Gorey Hill, Gorey

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-20096						
Chemtest Sample ID:	1220385						
Sample Ref:	TP01						
Sample ID:							
Sample Location:							
Top Depth(m):	0.50						
Bottom Depth(m):	0.50						
Sampling Date:	11-Jun-2021						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	1.5	3	5	6
Loss On Ignition	2610	M	%	6.6	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		7.1	--	>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	0.0013	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	0.0074	0.5	10	70
Copper	1455	U	0.0014	0.014	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	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	0.0008	0.0077	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	1.7	17	800	15000	25000
Fluoride	1220	U	0.22	2.2	10	150	500
Sulphate	1220	U	1.4	14	1000	20000	50000
Total Dissolved Solids	1020	N	36	360	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	5.6	56	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

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: 5861 Gorey Hill, Gorey

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-20096						
Chemtest Sample ID:	1220386						
Sample Ref:	TP02						
Sample ID:							
Sample Location:							
Top Depth(m):	0.50						
Bottom Depth(m):	0.50						
Sampling Date:	11-Jun-2021						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	2.4	3	5	6
Loss On Ignition	2610	M	%	9.0	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		6.5	--	>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	0.0015	0.015	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	0.0009	0.0092	0.5	10	70
Copper	1455	U	0.0018	0.018	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0008	0.0075	0.5	10	30
Nickel	1455	U	0.0007	0.0069	0.4	10	40
Lead	1455	U	0.0012	0.012	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	0.0007	0.0075	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.7	17	800	15000	25000
Fluoride	1220	U	0.15	1.5	10	150	500
Sulphate	1220	U	4.1	41	1000	20000	50000
Total Dissolved Solids	1020	N	32	320	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	8.0	80	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: 5861 Gorey Hill, Gorey

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-20096						
Chemtest Sample ID:	1220387						
Sample Ref:	TP03						
Sample ID:							
Sample Location:							
Top Depth(m):	0.50						
Bottom Depth(m):	0.50						
Sampling Date:	11-Jun-2021						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	1.3	3	5	6
Loss On Ignition	2610	M	%	5.9	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		7.1	--	>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	0.0012	0.012	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	0.0009	0.0088	0.5	10	70
Copper	1455	U	0.0010	0.010	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0008	0.0079	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	0.0006	0.0064	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	0.17	1.7	10	150	500
Sulphate	1220	U	4.9	49	1000	20000	50000
Total Dissolved Solids	1020	N	24	240	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.4	< 50	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: 5861 Gorey Hill, Gorey

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-20096						
Chemtest Sample ID:	1220388						
Sample Ref:	TP04						
Sample ID:							
Sample Location:							
Top Depth(m):	0.50						
Bottom Depth(m):	0.50						
Sampling Date:	11-Jun-2021						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	< 0.20	3	5	6
Loss On Ignition	2610	M	%	4.8	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		7.1	--	>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	< 0.0002	< 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	0.0007	0.0072	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	0.090	< 1.0	10	150	500
Sulphate	1220	U	10	100	1000	20000	50000
Total Dissolved Solids	1020	N	27	270	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	3.1	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	13

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: 5861 Gorey Hill, Gorey

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-20096						
Chemtest Sample ID:	1220389						
Sample Ref:	TP05						
Sample ID:							
Sample Location:							
Top Depth(m):	0.50						
Bottom Depth(m):	0.50						
Sampling Date:	11-Jun-2021						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	< 0.20	3	5	6
Loss On Ignition	2610	M	%	3.5	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		7.3	--	>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	< 0.0002	< 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	0.0007	0.0068	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	0.090	< 1.0	10	150	500
Sulphate	1220	U	3.8	38	1000	20000	50000
Total Dissolved Solids	1020	N	13	130	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	< 2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

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: 5861 Gorey Hill, Gorey

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-20096						
Chemtest Sample ID:	1220390						
Sample Ref:	TP06						
Sample ID:							
Sample Location:							
Top Depth(m):	0.50						
Bottom Depth(m):	0.50						
Sampling Date:	11-Jun-2021						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	< 0.20	3	5	6
Loss On Ignition	2610	M	%	3.7	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		7.3	--	>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	< 0.0002	< 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	0.0009	0.0086	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	1.1	11	800	15000	25000
Fluoride	1220	U	0.089	< 1.0	10	150	500
Sulphate	1220	U	3.4	34	1000	20000	50000
Total Dissolved Solids	1020	N	23	230	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	2.7	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	11

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: 5861 Gorey Hill, Gorey

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-20096						
Chemtest Sample ID:	1220391						
Sample Ref:	TP07						
Sample ID:							
Sample Location:							
Top Depth(m):	0.50						
Bottom Depth(m):	0.50						
Sampling Date:	11-Jun-2021						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	1.3	3	5	6
Loss On Ignition	2610	M	%	6.1	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		7.3	--	>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	< 0.0002	< 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	0.0008	0.0082	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	0.085	< 1.0	10	150	500
Sulphate	1220	U	2.6	26	1000	20000	50000
Total Dissolved Solids	1020	N	15	150	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	3.3	< 50	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.

Results - Single Stage WAC

Project: 5861 Gorey Hill, Gorey

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	21-20096						
Chemtest Sample ID:	1220392						
Sample Ref:	TP08						
Sample ID:							
Sample Location:							
Top Depth(m):	0.50						
Bottom Depth(m):	0.50						
Sampling Date:	11-Jun-2021						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	0.38	3	5	6
Loss On Ignition	2610	M	%	3.9	--	--	10
Total BTEX	2760	M	mg/kg	< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (Of 17) PAH's	2800	N	mg/kg	< 2.0	100	--	--
pH	2010	M		7.6	--	>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	< 0.0002	< 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	0.0008	0.0078	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	0.088	< 1.0	10	150	500
Sulphate	1220	U	4.8	48	1000	20000	50000
Total Dissolved Solids	1020	N	22	220	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	2.7	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

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.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

HazWasteOnline™

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.

BWDNT-89H9H-KV6V6

Job name

5861

Description/Comments

Client: Gerard Gannon Properties
Engineer: Waterman Moylan

Project

Gorey Hill

Site

Gorey, Co. Wexford

Classified by

Name:
Stephen Letch
Company:
Site Investigations Ltd
Date:
23 Jun 2021 08:26 GMT
Telephone:
00353 86817 9449

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: CERTIFIED

Course	Date
Hazardous Waste Classification	09 Oct 2019

Next 3 year Refresher due by Oct 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
1	TP01-0.50	0.50-0.50	Non Hazardous		Pass	Pass	2
2	TP02-0.50	0.50-0.50	Non Hazardous		Pass	Pass	6
3	TP03-0.50	0.50-0.50	Non Hazardous		Pass	Pass	10
4	TP04-0.50	0.50-0.50	Non Hazardous		Pass	Pass	14
5	TP05-0.50	0.50-0.50	Non Hazardous		Pass	Pass	18
6	TP06-0.50	0.50-0.50	Non Hazardous		Pass	Pass	22
7	TP07-0.50	0.50-0.50	Non Hazardous		Pass	Pass	26
8	TP08-0.50	0.50-0.50	Non Hazardous		Pass	Pass	30

Related documents

#	Name	Description
1	HWOL_21-20096-20210622 122628 REV.hwol	.hwol file used to create the Job

WAC results

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate the samples in this Job: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

Report

Created by: Stephen Letch
Created date: 23 Jun 2021 08:26 GMT

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	34
Appendix B: Rationale for selection of metal species	36
Appendix C: Version	37

Classification of sample: TP01-0.50

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

Sample details

Sample name:
TP01-0.50
Sample Depth:
0.50-0.50 m
Moisture content:
12%
(wet weight 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% Wet Weight 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	pH			PH		7.1	pH		7.1	pH	7.1 pH		
2	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 %		<LOD
3	sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		1.1	mg/kg		0.968	mg/kg	0.0000968 %	✓	
4	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 }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
5	barium { barium oxide }		215-127-9	1304-28-5		42	mg/kg	1.117	41.266	mg/kg	0.00413 %	✓	
6	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.15	mg/kg	1.142	0.151	mg/kg	0.0000151 %	✓	
7	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
8	antimony { antimony compounds, with the exception of the tetroxide (Sb2O4), pentoxide (Sb2O5), trisulphide (Sb2S3), pentasulphide (Sb2S5) and those specified elsewhere in this Annex }	051-003-00-9			1	<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
9	arsenic { arsenic }	033-001-00-X	231-148-6	7440-38-2		37	mg/kg		32.56	mg/kg	0.00326 %	✓	
10	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		32	mg/kg		28.16	mg/kg	0.00282 %	✓	
11	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
12	nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		33	mg/kg	1.273	36.956	mg/kg	0.0037 %	✓	
13	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	33	mg/kg		29.04	mg/kg	0.0029 %	✓	

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.8 mg/kg	1.405	0.989 mg/kg	0.0000989 %	✓	
15	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		70 mg/kg	1.245	76.674 mg/kg	0.00767 %	✓	
16	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
17	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		30 mg/kg	1.462	38.585 mg/kg	0.00386 %	✓	
18	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
19	benzene	601-020-00-8	200-753-7	71-43-2		<1 µg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
20	toluene	601-021-00-3	203-625-9	108-88-3		<1 µg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
21	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<1 µg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
22	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<1 µg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
23	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	acenaphthylene		205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	acenaphthene		201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	fluorene		201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	phenanthrene		201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	anthracene		204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
29	fluoranthene		205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
30	pyrene		204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
31	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
32	chrysene	601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
33	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
34	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
35	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
36	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
37	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	benzo[ghi]perylene		205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
39	coronene		205-881-7	191-07-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
40	monohydric phenols			P1186		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
41		xylene				<2	µg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
42	●	polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0306 %		

Key

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

WAC results for sample: TP01-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.5	3	5
2	LOI (loss on ignition)	%	6.6	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	7.1	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	0.002	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.013	0.5	2
10	barium	mg/kg	<0.0005	20	100
11	cadmium	mg/kg	<0.0001	0.04	1
12	chromium	mg/kg	0.0074	0.5	10
13	copper	mg/kg	0.014	2	50
14	mercury	mg/kg	<5.0e-05	0.01	0.2
15	molybdenum	mg/kg	0.011	0.5	10
16	nickel	mg/kg	<0.0005	0.4	10
17	lead	mg/kg	0.0077	0.5	10
18	antimony	mg/kg	<0.0005	0.06	0.7
19	selenium	mg/kg	<0.0005	0.1	0.5
20	zinc	mg/kg	<0.0025	4	50
21	chloride	mg/kg	17	800	15,000
22	fluoride	mg/kg	2.2	10	150
23	sulphate	mg/kg	14	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	56	500	800
26	TDS (total dissolved solids)	mg/kg	360	4,000	60,000

Key

User supplied data

Classification of sample: TP02-0.50

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

Sample details

Sample name:
TP02-0.50
Sample Depth:
0.50-0.50 m
Moisture content:
21%
(wet weight 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% Wet Weight 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	pH			PH		6.5	pH		6.5	pH	6.5 pH		
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.46	mg/kg	3.22	1.17	mg/kg	0.000117 %	✓	
3	sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		1.2	mg/kg		0.948	mg/kg	0.0000948 %	✓	
4	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 }	006-007-00-5				0.8	mg/kg	1.884	1.191	mg/kg	0.000119 %	✓	
5	barium { barium oxide }		215-127-9	1304-28-5		97	mg/kg	1.117	85.558	mg/kg	0.00856 %	✓	
6	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.32	mg/kg	1.142	0.289	mg/kg	0.0000289 %	✓	
7	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		**<LOD**
8	antimony { antimony compounds, with the exception of the tetroxide (Sb2O4), pentoxide (Sb2O5), trisulphide (Sb2S3), pentasulphide (Sb2S5) and those specified elsewhere in this Annex }	051-003-00-9			1	3.1	mg/kg		2.449	mg/kg	0.000245 %	✓	
9	arsenic { arsenic }	033-001-00-X	231-148-6	7440-38-2		59	mg/kg		46.61	mg/kg	0.00466 %	✓	
10	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		50	mg/kg		39.5	mg/kg	0.00395 %	✓	
11	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		0.16	mg/kg		0.126	mg/kg	0.0000126 %	✓	
12	nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		50	mg/kg	1.273	50.267	mg/kg	0.00503 %	✓	
13	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	61	mg/kg		48.19	mg/kg	0.00482 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		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	1.443	mg/kg	0.000144 %	✓	
15		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		150	mg/kg	1.245	147.499	mg/kg	0.0147 %	✓	
16		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		**<LOD**
17		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		59	mg/kg	1.462	68.123	mg/kg	0.00681 %	✓	
18		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		**<LOD**
19		benzene	601-020-00-8	200-753-7	71-43-2		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
20		toluene	601-021-00-3	203-625-9	108-88-3		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
21		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
22		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
23		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
31		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
32		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
33		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
34		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
35		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
36		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
37		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
38		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
39		coronene		205-881-7	191-07-1		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
40		monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
41		xylene											
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<2	µg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
42		polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0509 %		

Key

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

WAC results for sample: TP02-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	2.4	3	5
2	LOI (loss on ignition)	%	9	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	6.5	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.002	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.015	0.5	2
10	barium	mg/kg	<0.0005	20	100
11	cadmium	mg/kg	<0.0001	0.04	1
12	chromium	mg/kg	0.0092	0.5	10
13	copper	mg/kg	0.018	2	50
14	mercury	mg/kg	<5.0e-05	0.01	0.2
15	molybdenum	mg/kg	0.0075	0.5	10
16	nickel	mg/kg	0.0069	0.4	10
17	lead	mg/kg	0.012	0.5	10
18	antimony	mg/kg	<0.0005	0.06	0.7
19	selenium	mg/kg	0.0075	0.1	0.5
20	zinc	mg/kg	<0.0025	4	50
21	chloride	mg/kg	17	800	15,000
22	fluoride	mg/kg	1.5	10	150
23	sulphate	mg/kg	41	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	80	500	800
26	TDS (total dissolved solids)	mg/kg	320	4,000	60,000

Key

User supplied data

Classification of sample: TP03-0.50

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

Sample details

Sample name:
TP03-0.50
Sample Depth:
0.50-0.50 m
Moisture content:
16%
(wet weight 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% Wet Weight 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		7.1 pH		7.1 pH	7.1 pH		
2	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 %		<LOD
3	sulfur { sulfur } 016-094-00-1 / 231-722-6 / 7704-34-9		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
4	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 } 006-007-00-5		0.5 mg/kg	1.884	0.791 mg/kg	0.0000791 %	✓	
5	barium { barium oxide } 215-127-9 / 1304-28-5		80 mg/kg	1.117	75.029 mg/kg	0.0075 %	✓	
6	cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		0.18 mg/kg	1.142	0.173 mg/kg	0.0000173 %	✓	
7	molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<LOD
8	antimony { antimony compounds, with the exception of the tetroxide (Sb2O4), pentoxide (Sb2O5), trisulphide (Sb2S3), pentasulphide (Sb2S5) and those specified elsewhere in this Annex } 051-003-00-9	1	<2 mg/kg		<2 mg/kg	<0.0002 %		<LOD
9	arsenic { arsenic } 033-001-00-X / 231-148-6 / 7440-38-2		52 mg/kg		43.68 mg/kg	0.00437 %	✓	
10	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm] 029-024-00-X / 231-159-6 / 7440-50-8		39 mg/kg		32.76 mg/kg	0.00328 %	✓	
11	mercury { mercury } 080-001-00-0 / 231-106-7 / 7439-97-6		0.11 mg/kg		0.0924 mg/kg	0.00000924 %	✓	
12	nickel { nickel(II) oxide (nickel monoxide) } 028-003-00-2 / 215-215-7 [1] 234-323-5 [2] - [3] / 1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		48 mg/kg	1.273	51.311 mg/kg	0.00513 %	✓	
13	lead { lead compounds with the exception of those specified elsewhere in this Annex } 082-001-00-6	1	38 mg/kg		31.92 mg/kg	0.00319 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1.4	mg/kg	1.405	1.652	mg/kg	0.000165 %	✓	
		034-002-00-8											
15		zinc { zinc oxide }				120	mg/kg	1.245	125.467	mg/kg	0.0125 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
16		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
17		chromium in chromium(III) compounds { chromium(III) oxide }				50	mg/kg	1.462	61.385	mg/kg	0.00614 %	✓	
			215-160-9	1308-38-9									
18		TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
19		benzene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
20		toluene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
21		ethylbenzene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
22		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
23		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
24		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
25		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
26		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
27		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
28		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
29		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
30		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
31		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
32		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
33		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
34		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
35		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
36		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
37		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
38		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
39		coronene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-881-7	191-07-1									
40		monohydric phenols				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
				P1186									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
41		xylene				<2	µg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
42	●	polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0444 %		

Key

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

WAC results for sample: TP03-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.3	3	5
2	LOI (loss on ignition)	%	5.9	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	7.1	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.002	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	0.012	0.5	2
10	barium	mg/kg	<0.0005	20	100
11	cadmium	mg/kg	<0.0001	0.04	1
12	chromium	mg/kg	0.0088	0.5	10
13	copper	mg/kg	0.01	2	50
14	mercury	mg/kg	<5.0e-05	0.01	0.2
15	molybdenum	mg/kg	0.0079	0.5	10
16	nickel	mg/kg	<0.0005	0.4	10
17	lead	mg/kg	0.0064	0.5	10
18	antimony	mg/kg	<0.0005	0.06	0.7
19	selenium	mg/kg	<0.0005	0.1	0.5
20	zinc	mg/kg	<0.0025	4	50
21	chloride	mg/kg	10	800	15,000
22	fluoride	mg/kg	1.7	10	150
23	sulphate	mg/kg	49	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	<50	500	800
26	TDS (total dissolved solids)	mg/kg	240	4,000	60,000

Key

User supplied data

Classification of sample: TP04-0.50

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

Sample details

Sample name:
TP04-0.50
Sample Depth:
0.50-0.50 m
Moisture content:
13%
(wet weight 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: 13% Wet Weight 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		7.1 pH		7.1 pH	7.1 pH		
2	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 %		<LOD
3	sulfur { sulfur } 016-094-00-1 / 231-722-6 / 7704-34-9		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
4	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 } 006-007-00-5		1 mg/kg	1.884	1.639 mg/kg	0.000164 %	✓	
5	barium { barium oxide } 215-127-9 / 1304-28-5		57 mg/kg	1.117	55.368 mg/kg	0.00554 %	✓	
6	cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		0.16 mg/kg	1.142	0.159 mg/kg	0.0000159 %	✓	
7	molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<LOD
8	antimony { antimony compounds, with the exception of the tetroxide (Sb2O4), pentoxide (Sb2O5), trisulphide (Sb2S3), pentasulphide (Sb2S5) and those specified elsewhere in this Annex } 051-003-00-9	1	<2 mg/kg		<2 mg/kg	<0.0002 %		<LOD
9	arsenic { arsenic } 033-001-00-X / 231-148-6 / 7440-38-2		40 mg/kg		34.8 mg/kg	0.00348 %	✓	
10	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm] 029-024-00-X / 231-159-6 / 7440-50-8		40 mg/kg		34.8 mg/kg	0.00348 %	✓	
11	mercury { mercury } 080-001-00-0 / 231-106-7 / 7439-97-6		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
12	nickel { nickel(II) oxide (nickel monoxide) } 028-003-00-2 / 215-215-7 [1] 234-323-5 [2] - [3] / 1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		54 mg/kg	1.273	59.786 mg/kg	0.00598 %	✓	
13	lead { lead compounds with the exception of those specified elsewhere in this Annex } 082-001-00-6	1	40 mg/kg		34.8 mg/kg	0.00348 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.1	mg/kg	1.405	1.345	mg/kg	0.000134 %	✓	
15		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		120	mg/kg	1.245	129.948	mg/kg	0.013 %	✓	
16		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		**<LOD**
17		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		53	mg/kg	1.462	67.392	mg/kg	0.00674 %	✓	
18		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		**<LOD**
19		benzene	601-020-00-8	200-753-7	71-43-2		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
20		toluene	601-021-00-3	203-625-9	108-88-3		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
21		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
22		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
23		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
31		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
32		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
33		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
34		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
35		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
36		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
37		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
38		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
39		coronene		205-881-7	191-07-1		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
40		monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
41		xylene											
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<2	µg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
42	●	polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.044 %		

Key

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

WAC results for sample: TP04-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	<0.2	3	5
2	LOI (loss on ignition)	%	4.8	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	7.1	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.002	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.0002	0.5	2
10	barium	mg/kg	<0.0005	20	100
11	cadmium	mg/kg	<0.0001	0.04	1
12	chromium	mg/kg	<0.0005	0.5	10
13	copper	mg/kg	<0.0005	2	50
14	mercury	mg/kg	<5.0e-05	0.01	0.2
15	molybdenum	mg/kg	0.0072	0.5	10
16	nickel	mg/kg	<0.0005	0.4	10
17	lead	mg/kg	<0.0005	0.5	10
18	antimony	mg/kg	<0.0005	0.06	0.7
19	selenium	mg/kg	<0.0005	0.1	0.5
20	zinc	mg/kg	<0.0025	4	50
21	chloride	mg/kg	<10	800	15,000
22	fluoride	mg/kg	<1	10	150
23	sulphate	mg/kg	100	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	<50	500	800
26	TDS (total dissolved solids)	mg/kg	270	4,000	60,000

Key

User supplied data

Classification of sample: TP05-0.50

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

Sample details

Sample name:
TP05-0.50
Sample Depth:
0.50-0.50 m
Moisture content:
12%
(wet weight 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% Wet Weight 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		7.3 pH		7.3 pH	7.3 pH		
2	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 %		<LOD
3	sulfur { sulfur } 016-094-00-1 / 231-722-6 / 7704-34-9		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
4	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 } 006-007-00-5		0.6 mg/kg	1.884	0.995 mg/kg	0.0000995 %	✓	
5	barium { barium oxide } 215-127-9 / 1304-28-5		42 mg/kg	1.117	41.266 mg/kg	0.00413 %	✓	
6	cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
7	molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		<2 mg/kg	1.5	<3 mg/kg	<0.0003 %		<LOD
8	antimony { antimony compounds, with the exception of the tetroxide (Sb2O4), pentoxide (Sb2O5), trisulphide (Sb2S3), pentasulphide (Sb2S5) and those specified elsewhere in this Annex } 051-003-00-9	1	<2 mg/kg		<2 mg/kg	<0.0002 %		<LOD
9	arsenic { arsenic } 033-001-00-X / 231-148-6 / 7440-38-2		47 mg/kg		41.36 mg/kg	0.00414 %	✓	
10	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm] 029-024-00-X / 231-159-6 / 7440-50-8		34 mg/kg		29.92 mg/kg	0.00299 %	✓	
11	mercury { mercury } 080-001-00-0 / 231-106-7 / 7439-97-6		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
12	nickel { nickel(II) oxide (nickel monoxide) } 028-003-00-2 / 215-215-7 [1] 234-323-5 [2] - [3] / 1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		37 mg/kg	1.273	41.436 mg/kg	0.00414 %	✓	
13	lead { lead compounds with the exception of those specified elsewhere in this Annex } 082-001-00-6	1	23 mg/kg		20.24 mg/kg	0.00202 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.23	mg/kg	1.405	0.284	mg/kg	0.0000284 %	✓	
		034-002-00-8											
15		zinc { zinc oxide }				75	mg/kg	1.245	82.151	mg/kg	0.00822 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
16		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
17		chromium in chromium(III) compounds { chromium(III) oxide }				41	mg/kg	1.462	52.733	mg/kg	0.00527 %	✓	
			215-160-9	1308-38-9									
18		TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
19		benzene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
20		toluene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
21		ethylbenzene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
22		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
23		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
24		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
25		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
26		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
27		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
28		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
29		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
30		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
31		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
32		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
33		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
34		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
35		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
36		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
37		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
38		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
39		coronene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-881-7	191-07-1									
40		monohydric phenols				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
				P1186									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
41		xylene											
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<2	µg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
42	●	polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0331 %		

Key

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

WAC results for sample: TP05-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	<0.2	3	5
2	LOI (loss on ignition)	%	3.5	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	7.3	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.002	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.0002	0.5	2
10	barium	mg/kg	<0.0005	20	100
11	cadmium	mg/kg	<0.0001	0.04	1
12	chromium	mg/kg	<0.0005	0.5	10
13	copper	mg/kg	<0.0005	2	50
14	mercury	mg/kg	<5.0e-05	0.01	0.2
15	molybdenum	mg/kg	0.0068	0.5	10
16	nickel	mg/kg	<0.0005	0.4	10
17	lead	mg/kg	<0.0005	0.5	10
18	antimony	mg/kg	<0.0005	0.06	0.7
19	selenium	mg/kg	<0.0005	0.1	0.5
20	zinc	mg/kg	<0.0025	4	50
21	chloride	mg/kg	<10	800	15,000
22	fluoride	mg/kg	<1	10	150
23	sulphate	mg/kg	38	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	<50	500	800
26	TDS (total dissolved solids)	mg/kg	130	4,000	60,000

Key

User supplied data

Classification of sample: TP06-0.50

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

Sample details

Sample name:
TP06-0.50
Sample Depth:
0.50-0.50 m
Moisture content:
11%
(wet weight 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% Wet Weight 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	pH			PH		7.3	pH		7.3	pH	7.3 pH		
2	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 %		**<LOD**
3	sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		<1	mg/kg		<1	mg/kg	<0.0001 %		**<LOD**
4	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 }	006-007-00-5				0.5	mg/kg	1.884	0.838	mg/kg	0.0000838 %	✓	
5	barium { barium oxide }		215-127-9	1304-28-5		48	mg/kg	1.117	47.697	mg/kg	0.00477 %	✓	
6	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.11	mg/kg	1.142	0.112	mg/kg	0.0000112 %	✓	
7	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		**<LOD**
8	antimony { antimony compounds, with the exception of the tetroxide (Sb2O4), pentoxide (Sb2O5), trisulphide (Sb2S3), pentasulphide (Sb2S5) and those specified elsewhere in this Annex }	051-003-00-9			1	<2	mg/kg		<2	mg/kg	<0.0002 %		**<LOD**
9	arsenic { arsenic }	033-001-00-X	231-148-6	7440-38-2		36	mg/kg		32.04	mg/kg	0.0032 %	✓	
10	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		37	mg/kg		32.93	mg/kg	0.00329 %	✓	
11	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
12	nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		50	mg/kg	1.273	56.63	mg/kg	0.00566 %	✓	
13	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	26	mg/kg		23.14	mg/kg	0.00231 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.67	mg/kg	1.405	0.838	mg/kg	0.0000838 %	✓	
		034-002-00-8											
15		zinc { zinc oxide }				97	mg/kg	1.245	107.456	mg/kg	0.0107 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
16		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
17		chromium in chromium(III) compounds { chromium(III) oxide }				45	mg/kg	1.462	58.535	mg/kg	0.00585 %	✓	
			215-160-9	1308-38-9									
18		TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
19		benzene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
20		toluene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
21		ethylbenzene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
22		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
23		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
24		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
25		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
26		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
27		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
28		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
29		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
30		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
31		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
32		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
33		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
34		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
35		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
36		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
37		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
38		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
39		coronene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-881-7	191-07-1									
40		monohydric phenols				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
				P1186									

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
41		xylene									
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<2 µg/kg		<0.002 mg/kg	<0.0000002 %		**<LOD**
42	●	polychlorobiphenyls; PCB				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3							
								Total:	0.038 %		

Key

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

WAC results for sample: TP06-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	<0.2	3	5
2	LOI (loss on ignition)	%	3.7	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	7.3	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.002	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.0002	0.5	2
10	barium	mg/kg	<0.0005	20	100
11	cadmium	mg/kg	<0.0001	0.04	1
12	chromium	mg/kg	<0.0005	0.5	10
13	copper	mg/kg	<0.0005	2	50
14	mercury	mg/kg	<5.0e-05	0.01	0.2
15	molybdenum	mg/kg	0.0086	0.5	10
16	nickel	mg/kg	<0.0005	0.4	10
17	lead	mg/kg	<0.0005	0.5	10
18	antimony	mg/kg	<0.0005	0.06	0.7
19	selenium	mg/kg	<0.0005	0.1	0.5
20	zinc	mg/kg	<0.0025	4	50
21	chloride	mg/kg	11	800	15,000
22	fluoride	mg/kg	<1	10	150
23	sulphate	mg/kg	34	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	<50	500	800
26	TDS (total dissolved solids)	mg/kg	230	4,000	60,000

Key

User supplied data

Classification of sample: TP07-0.50

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

Sample details

Sample name:
TP07-0.50
Sample Depth:
0.50-0.50 m
Moisture content:
22%
(wet weight 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% Wet Weight 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	pH			PH		7.3	pH		7.3	pH	7.3 pH		
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.83	mg/kg	3.22	2.085	mg/kg	0.000208 %	✓	
3	sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		1.1	mg/kg		0.858	mg/kg	0.0000858 %	✓	
4	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 }	006-007-00-5				0.7	mg/kg	1.884	1.029	mg/kg	0.000103 %	✓	
5	barium { barium oxide }		215-127-9	1304-28-5		48	mg/kg	1.117	41.802	mg/kg	0.00418 %	✓	
6	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.11	mg/kg	1.142	0.098	mg/kg	0.0000098 %	✓	
7	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		<LOD
8	antimony { antimony compounds, with the exception of the tetroxide (Sb2O4), pentoxide (Sb2O5), trisulphide (Sb2S3), pentasulphide (Sb2S5) and those specified elsewhere in this Annex }	051-003-00-9			1	<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
9	arsenic { arsenic }	033-001-00-X	231-148-6	7440-38-2		31	mg/kg		24.18	mg/kg	0.00242 %	✓	
10	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		33	mg/kg		25.74	mg/kg	0.00257 %	✓	
11	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
12	nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		42	mg/kg	1.273	41.69	mg/kg	0.00417 %	✓	
13	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	22	mg/kg		17.16	mg/kg	0.00172 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1	mg/kg	1.405	1.096	mg/kg	0.00011 %	✓	
		034-002-00-8											
15		zinc { zinc oxide }				87	mg/kg	1.245	84.466	mg/kg	0.00845 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
16		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
17		chromium in chromium(III) compounds { chromium(III) oxide }				43	mg/kg	1.462	49.021	mg/kg	0.0049 %	✓	
			215-160-9	1308-38-9									
18		TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
19		benzene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
20		toluene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
21		ethylbenzene				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
22		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<1	µg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
23		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
24		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
25		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
26		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
27		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
28		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
29		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
30		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
31		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
32		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
33		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
34		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
35		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
36		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
37		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
38		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
39		coronene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-881-7	191-07-1									
40		monohydric phenols				0.5	mg/kg		0.39	mg/kg	0.000039 %	✓	
				P1186									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
41		xylene				<2	µg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
42	●	polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0307 %		

Key

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

WAC results for sample: TP07-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	1.3	3	5
2	LOI (loss on ignition)	%	6.1	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	7.3	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.002	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.0002	0.5	2
10	barium	mg/kg	<0.0005	20	100
11	cadmium	mg/kg	<0.0001	0.04	1
12	chromium	mg/kg	<0.0005	0.5	10
13	copper	mg/kg	<0.0005	2	50
14	mercury	mg/kg	<5.0e-05	0.01	0.2
15	molybdenum	mg/kg	0.0082	0.5	10
16	nickel	mg/kg	<0.0005	0.4	10
17	lead	mg/kg	<0.0005	0.5	10
18	antimony	mg/kg	<0.0005	0.06	0.7
19	selenium	mg/kg	<0.0005	0.1	0.5
20	zinc	mg/kg	<0.0025	4	50
21	chloride	mg/kg	<10	800	15,000
22	fluoride	mg/kg	<1	10	150
23	sulphate	mg/kg	26	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	<50	500	800
26	TDS (total dissolved solids)	mg/kg	150	4,000	60,000

Key

User supplied data

Classification of sample: TP08-0.50

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

Sample details

Sample name:
TP08-0.50
Sample Depth:
0.50-0.50 m
Moisture content:
12%
(wet weight 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% Wet Weight 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	pH			PH		7.6	pH		7.6	pH	7.6 pH		
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		0.57	mg/kg	3.22	1.615	mg/kg	0.000162 %	✓	
3	sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		1.2	mg/kg		1.056	mg/kg	0.000106 %	✓	
4	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 }	006-007-00-5				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		**<LOD**
5	barium { barium oxide }		215-127-9	1304-28-5		39	mg/kg	1.117	38.318	mg/kg	0.00383 %	✓	
6	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		**<LOD**
7	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<2	mg/kg	1.5	<3	mg/kg	<0.0003 %		**<LOD**
8	antimony { antimony compounds, with the exception of the tetroxide (Sb2O4), pentoxide (Sb2O5), trisulphide (Sb2S3), pentasulphide (Sb2S5) and those specified elsewhere in this Annex }	051-003-00-9			1	<2	mg/kg		<2	mg/kg	<0.0002 %		**<LOD**
9	arsenic { arsenic }	033-001-00-X	231-148-6	7440-38-2		32	mg/kg		28.16	mg/kg	0.00282 %	✓	
10	granulated copper; [particle length: from 0,9 mm to 6,0 mm; particle width: from 0,494 to 0,949 mm]	029-024-00-X	231-159-6	7440-50-8		35	mg/kg		30.8	mg/kg	0.00308 %	✓	
11	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
12	nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		39	mg/kg	1.273	43.675	mg/kg	0.00437 %	✓	
13	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	17	mg/kg		14.96	mg/kg	0.0015 %	✓	

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.37	mg/kg	1.405	0.457	mg/kg	0.0000457 %	✓	
15		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		71	mg/kg	1.245	77.77	mg/kg	0.00778 %	✓	
16		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		**<LOD**
17		chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		36	mg/kg	1.462	46.302	mg/kg	0.00463 %	✓	
18		TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		**<LOD**
19		benzene	601-020-00-8	200-753-7	71-43-2		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
20		toluene	601-021-00-3	203-625-9	108-88-3		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
21		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
22		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<1	µg/kg		<0.001	mg/kg	<0.0000001 %		**<LOD**
23		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
24		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
25		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
26		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
27		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
29		fluoranthene		205-912-4	206-44-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		pyrene		204-927-3	129-00-0		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
31		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
32		chrysene	601-048-00-0	205-923-4	218-01-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
33		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
34		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
35		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
36		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
37		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
38		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
39		coronene		205-881-7	191-07-1		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
40		monohydric phenols			P1186		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
41		xylene				<2	µg/kg		<0.002	mg/kg	<0.0000002 %		**<LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
42	●	polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0302 %		

Key

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

WAC results for sample: TP08-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.38	3	5
2	LOI (loss on ignition)	%	3.9	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<2	100	-
7	pH	pH	7.6	-	>6
8	ANC (acid neutralisation capacity)	mol/kg	<0.002	-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.0002	0.5	2
10	barium	mg/kg	<0.0005	20	100
11	cadmium	mg/kg	<0.0001	0.04	1
12	chromium	mg/kg	<0.0005	0.5	10
13	copper	mg/kg	<0.0005	2	50
14	mercury	mg/kg	<5.0e-05	0.01	0.2
15	molybdenum	mg/kg	0.0078	0.5	10
16	nickel	mg/kg	<0.0005	0.4	10
17	lead	mg/kg	<0.0005	0.5	10
18	antimony	mg/kg	<0.0005	0.06	0.7
19	selenium	mg/kg	<0.0005	0.1	0.5
20	zinc	mg/kg	<0.0025	4	50
21	chloride	mg/kg	10	800	15,000
22	fluoride	mg/kg	<1	10	150
23	sulphate	mg/kg	48	1,000	20,000
24	phenol index	mg/kg	<0.3	1	-
25	DOC (dissolved organic carbon)	mg/kg	<50	500	800
26	TDS (total dissolved solids)	mg/kg	220	4,000	60,000

Key

User supplied data

Appendix A: Classifier defined and non CLP determinands

pH (CAS Number: PH)

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

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

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

Description/Comments: Data from ECHA's C&L Inventory Database, Sigma Aldrich SDS dated 6/2/20
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/88825
Data source date: 02 Apr 2020
Hazard Statements: Acute Tox. 3 H301 , Skin Corr. 1B H314 , Eye Dam. 1 H318 , Acute Tox. 1 H332

arsenic (EC Number: 231-148-6, CAS Number: 7440-38-2)

CLP index number: 033-001-00-X
Description/Comments: Worst Case: IARC considers arsenic Group 1; Carcinogenic to humans
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):
29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

lead compounds with the exception of those specified elsewhere in this Annex

CLP index number: 082-001-00-6
Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers many simple lead compounds to be Carcinogenic category 2
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

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

Description/Comments: Data from ECHA's C&L inventory database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 30 Apr 2020
Hazard Statements: Acute Tox. 4 H302 , Skin Sens. 1 H317 , Eye Irrit. 2 H319

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

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

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 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

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

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

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

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

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

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

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

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

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

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 , 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

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

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
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):
29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

Appendix B: Rationale for selection of metal species

boron {diboron trioxide; boric oxide}

Diboron trioxide used as the most hazardous species.

sulfur {sulfur}

chemtest reports Elemental sulfur using this CAS

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}

Available species

barium {barium oxide}

Chromium VII at limits of detection. Barium oxide used as the next most hazardous species. No chromate present.

cadmium {cadmium oxide}

Chromium VII at limits of detection. Cadmium oxide used as the next most hazardous species. No chromate present.

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight.

antimony {antimony compounds, with the exception of the tetroxide (Sb2O4), pentoxide (Sb2O5), trisulphide (Sb2S3), pentasulphide (Sb2S5) and those specified elsewhere in this Annex}

Chromium VI at limits of detection. Antimony compounds used as the next most hazardous species. No chromate present.

arsenic {arsenic}

Worst Case Scenario

mercury {mercury}

Worst case CLP species based on hazard statements/molecular weight

nickel {nickel(II) oxide (nickel monoxide)}

Chromium VI at limits of detection. Nickel oxide used as the next most hazardous species. No chromate present.

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Chromium VI at limits of detection. Lead compounds used as the next most hazardous species. No chromate present.

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

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

zinc {zinc oxide}

Chromium VI at limits of detection. Zinc oxide used as the next most hazardous species. No chromate present.

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

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

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

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

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2021.162.4804.9151 (21 Jun 2021)
HazWasteOnline Database: 2021.162.4804.9151 (21 Jun 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

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.:	21-20943-1
Initial Date of Issue:	24-Jun-2021
Client	Site Investigations Ltd
Client Address:	The Grange12th, Lock Road Lucan Co Dublin IRELAND
Contact(s):	Stephen Letch
Project	5851 Gorey Hill
Quotation No.:	
Order No.:	34/A/21
No. of Samples:	8
Turnaround (Wkdays):	5
Date Approved:	24-Jun-2021
Approved By:	
Details:	Glynn Harvey, Technical Manager

Date Received:	18-Jun-2021
Date Instructed:	18-Jun-2021
Results Due:	24-Jun-2021

Results - Soil

Project: 5851 Gorey Hill

Client: Site Investigations Ltd				**Chemtest Job No.:**	21-20943	21-20943	21-20943	21-20943	21-20943	21-20943	21-20943	21-20943
Quotation No.:				**Chemtest Sample ID.:**	1224569	1224570	1224571	1224572	1224573	1224574	1224575	1224576
Order No.: 34/A/21				Client Sample Ref.:	TP01	TP02	TP03	TP04	TP5	TP06	TP07	TP08
				Client Sample ID.:	MK 27	MK 03	MK 24	MK 14	MK 06	MK 21	MK 10	MK 18
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	1.0	1.0	1.8	1.5	1.0	1.5	1.0	1.5
				Bottom Depth (m):	1.0	1.0	1.8	1.5	1.0	1.5	1.0	1.5
				Date Sampled:	16-Jun-2021	16-Jun-2021	16-Jun-2021	16-Jun-2021	16-Jun-2021	16-Jun-2021	16-Jun-2021	16-Jun-2021
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Moisture	N	2030	%	0.020	9.0	9.8	10	11	11	8.7	11	12
Loss on Ignition 440 (Fines)	U	2620	%	0.20	[E] 2.0	[E] 2.5	[E] 2.4	[E] 0.42	[E] 1.1	[E] 1.1	[E] 8.7	[E] 0.69
Group 1 & 2 Material > 20mm	N	2620	%	0.10	27	14	17	61	13	24	15	11

Deviations

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

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1224569	TP01	MK 27		16-Jun-2021	E	Plastic Tub 500g
1224570	TP02	MK 03		16-Jun-2021	E	Plastic Tub 500g
1224571	TP03	MK 24		16-Jun-2021	E	Plastic Tub 500g
1224572	TP04	MK 14		16-Jun-2021	E	Plastic Tub 500g
1224573	TP5	MK 06		16-Jun-2021	E	Plastic Tub 500g
1224574	TP06	MK 21		16-Jun-2021	E	Plastic Tub 500g
1224575	TP07	MK 10		16-Jun-2021	E	Plastic Tub 500g
1224576	TP08	MK 18		16-Jun-2021	E	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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

Appendix 5

Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Trial Pits					
TP01	713590.283	659508.660	119.34	313664.690	159466.052
TP02	713669.183	659466.412	109.53	313743.608	159423.795
TP03	713493.341	659306.428	119.73	313567.728	159263.775
TP04	713601.218	659341.982	110.17	313675.628	159299.337
TP05	713680.205	659326.329	103.76	313754.633	159283.681
TP06	713441.485	659188.458	116.30	313515.860	159145.779
TP07	713654.958	659207.691	103.83	313729.381	159165.017
TP08	713494.287	659094.363	106.95	313568.675	159051.663



Contract No:	5861	Client:	Gerard Gannon Properties	Legend Key
Contract:	Gorey Hill	Engineer:	Waterman Moylan	Locations By Type - TP
Location:	Gorey, Co. Wexford	Scale:	1:2500	
Title:	Site Plan	Drawn By:	SL	

APPENDIX C – UISCE EIREANN CONFIRMATION OF FEASIBILITY & STATEMENT OF DESIGN ACCEPTANCE

CONFIRMATION OF FEASIBILITY

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

Cathal Kennedy

Unit 6 - Kingswood Business Centre
Citywest Business Campus
Co. Dublin
D24 A068

1 May 2025

Our Ref: CDS25001054 Pre-Connection Enquiry
Site at R725, Gorey, Co. Wexford

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Uisce Éireann has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 401 unit(s) at Site at R725, Gorey, Co. Wexford **(the Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible Subject to upgrades:

  In order to facilitate the proposed connection at the Development, the Uisce Éireann water network will have to be extended by approximately 150m along Kilnahue Lane. In addition to this required network extension, approximately 860m of network upgrades to the existing water network will be required to provide additional network capacity.

  Uisce Éireann does not currently have any plans to undertake these works, therefore the applicant will be required to fund these local network extensions and upgrades. These works will be carried out by Uisce Éireann and the costs for this will be included in your connection fee. Please see www.water.ie/connections/ for information on connection charges.

- **Wastewater Connection** - Feasible Subject to upgrades:

  In order to facilitate the proposed connection at the Development, the Uisce Éireann wastewater network will have to be extended by approximately 120m from Carnew Road. In addition to this required network extension, approximately 2.2km of network upgrades to the

Stiúrthóirí / Directors: Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares.
Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

existing wastewater network will be required to provide additional network capacity for the proposed scale of development.

Uisce Éireann does not currently have any plans to undertake these works, therefore the applicant will be required to fund these local network extensions and upgrades (the exact extent of which shall be assessed further at connection application stage). These works will be carried out by Uisce Éireann and the costs for this will be included in your connection fee. Please see www.water.ie/connections/ for information on connection charges.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Uisce Éireann's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Uisce Éireann's network(s). This is not a connection offer and capacity in Uisce Éireann's network(s) may only be secured by entering into a connection agreement with Uisce Éireann.

For any further information, visit **www.water.ie/connections**, **email newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,

Dermot Phelan
Connections Delivery Manager

Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Uisce Éireann's network(s). • Before the Development can connect to Uisce Éireann's network(s), you must submit a connection application and be granted and sign a connection agreement with Uisce Éireann.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Uisce Éireann connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Uisce Éireann's network(s), including works in the public space, must be carried out by Uisce Éireann*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Uisce Éireann's network(s)?	• Requests for maps showing Uisce Éireann's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Uisce Éireann Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

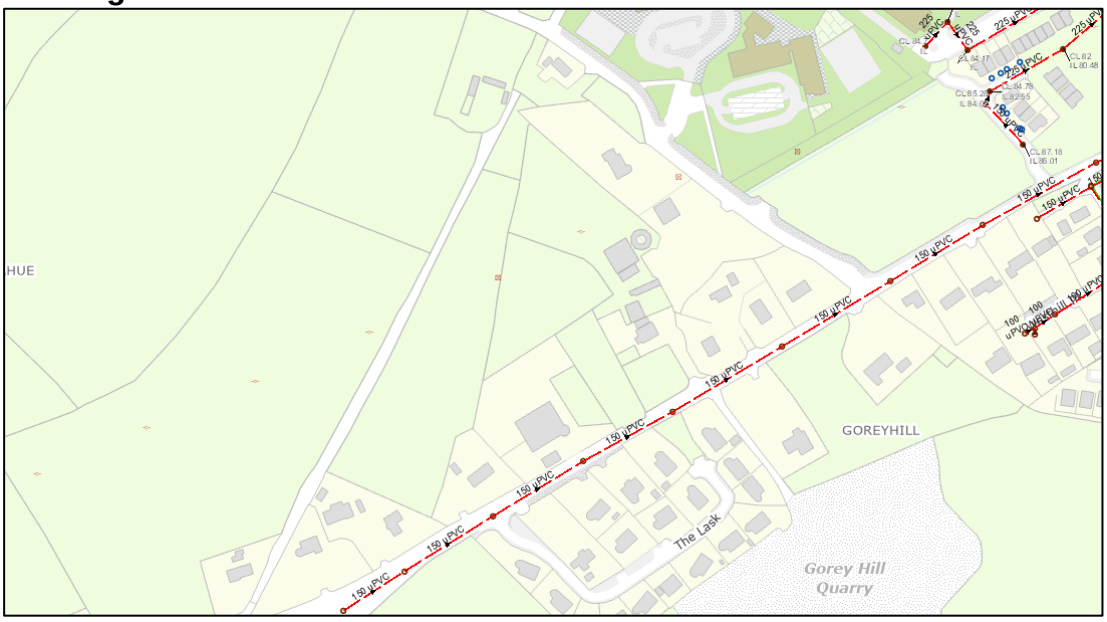
Section B – Details of Uisce Éireann's Network(s)

The map included below outlines the current Uisce Éireann infrastructure adjacent the Development: To access Uisce Éireann Maps email datarequests@water.ie

Existing Water Infrastructure:



Existing Wastewater Infrastructure:



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34.

Note: The information provided on the included maps as to the position of Uisce Éireann's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Uisce Éireann.

Whilst every care has been taken in respect of the information on Uisce Éireann's network(s), Uisce Éireann assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Uisce Éireann's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Uisce Éireann's underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Cathal Kennedy

AKM Design

Unit 6
Kingswood Business Centre
Citywest Business Campus
Citywest, Dublin 24 D24A068

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Uisce Éireann
PO Box 448
South City
Delivery Office
Cork City

www.water.ie

24 November 2025

Re: Design Submission for Site at, R725, Gorey, Wexford, Wexford (the "Development") (the "Design Submission") / Connection Reference No: CDS25001054

Dear Cathal Kennedy,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Uisce Éireann has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Uisce Éireann infrastructure. Before you can connect to our network you must sign a connection agreement with Uisce Éireann. This can be applied for by completing the connection application form at www.water.ie/connections. Uisce Éireann's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Uisce Éireann's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Uisce Éireann does not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Uisce Éireann representative:
Name: Emilio Miranda Muros
Phone:
Email: emilio.mirandamuros@water.ie

Stiúrthóirí / Directors: Niall Gleeson (POF / CEO), Jerry Grant (Cathaoirleach / Chairperson), Gerard Britchfield, Liz Joyce, Michael Nolan, Patricia King, Eileen Maher, Cathy Mannion, Paul Reid, Michael Walsh.
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin, Ireland D01NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Uisce Éireann is a designated activity company, limited by shares. Cláraithe in Éirinn Uimh.: 530363 / Registered in Ireland No.: 530363.

Yours sincerely,



Dermot Phelan
Connections Delivery Manager

Appendix A

Document Title & Revision

Drawing number	Drawing title	Rev
Foul, Storm and Watermain Layout		
300001	PROPOSED STORM AND FOUL DRAINAGE - GENERAL LAYOUT	**01**
300002	PROPOSED STORM AND FOUL DRAINAGE - SHEET 1 OF 5	**01**
300003	PROPOSED STORM AND FOUL DRAINAGE - SHEET 2 OF 5	**01**
300004	PROPOSED STORM AND FOUL DRAINAGE - SHEET 3 OF 5	**01**
300005	PROPOSED STORM AND FOUL DRAINAGE - SHEET 4 OF 5	**01**
300006	PROPOSED STORM AND FOUL DRAINAGE - SHEET 5 OF 5	**01**
300007	PROPOSED WATERMAIN - GENERAL LAYOUT	**01**
300008	PROPOSED WATERMAIN - SHEET 1 OF 6	**01**
300009	PROPOSED WATERMAIN - SHEET 2 OF 6	**01**
300010	PROPOSED WATERMAIN - SHEET 3 OF 6	**01**
300011	PROPOSED WATERMAIN - SHEET 4 OF 6	**01**
300012	PROPOSED WATERMAIN - SHEET 5 OF 6	**01**
300013	PROPOSED WATERMAIN - SHEET 6 OF 6	**01**

Offsite Foul Layout		
300101	PROPOSED OFFSITE FOUL LAYOUT - SHEET 1 OF 4	**02**
300102	PROPOSED OFFSITE FOUL LAYOUT - SHEET 2 OF 4	**02**
300103	PROPOSED OFFSITE FOUL LAYOUT - SHEET 3 OF 4	**02**
300104	PROPOSED OFFSITE FOUL LAYOUT - SHEET 4 OF 4	**02**
Long Sections		
410001	PROPOSED FOUL SECTION SHEET 1 OF 3	**02**
410002	PROPOSED FOUL SECTION SHEET 2 OF 3	**02**
410003	PROPOSED FOUL SECTION SHEET 3 OF 3	**02**

*For further information, visit **www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Uisce Éireann will not, in any way, render Uisce Éireann liable for any elements of the design and/or construction of the Self-Lay Works.

APPENDIX D – OPW FLOOD MAPPING & INFORMATION

Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 0.5% AEP	Flow (m³/s) 0.5% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
1113BA00000	73.28	0.65	73.48	1.41	73.61	2.11

CREAGH UPPER

KILNAHUE

Site Boundary

1113BA00000

313000 313200 313400 313600 313800 314000 314200 314400

160400 160200 160000 159800 159600 159400 159200

0 50 100 200 300 400 500 Metres

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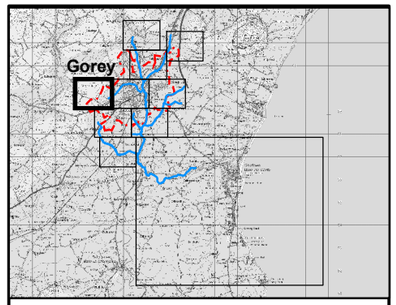


IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event
- Modelled River Centreline
- AFA Extents
- Node Point
- Node ID Node Label

FINAL

REV:	NOTE:	DATE:

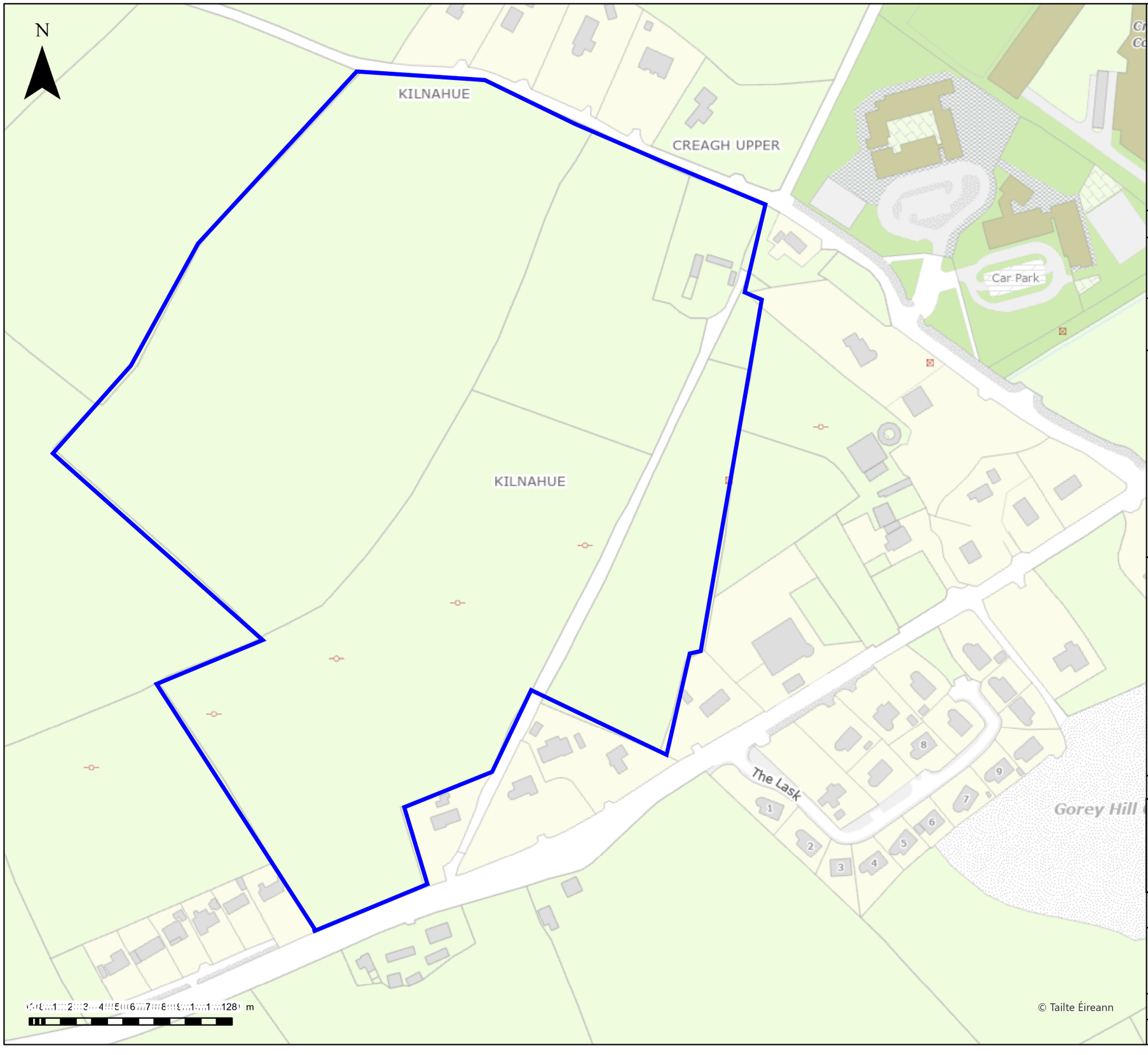
SOUTH EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

OPW Oifig na nOibreacha Poiblí The Office of Public Works
The Office of Public Works, Jonathan Swift Street, Trim, Co Meath
RPS, Elmwood House, 74 Boucher Road, Belfast, BT12 6RZ
T +44(0) 28 90 667914 F +44(0) 28 90 668286 W www.rpsgroup.com E ireland@rpsgroup.com

Map: Gorey Fluvial Flood Extents

Map Type:	EXTENT
Source:	FLUVIAL
Map Area:	HPW
Scenario:	CURRENT
Drawn By : F.M.C.	Date : 15 July 2016
Checked By : E.H.	Date : 15 July 2016
Approved By : S.P.	Date : 15 July 2016
Drawing No. :	O11GOR_EXFCD_F0_04
Map Series :	Page 4 of 10
Drawing Scale : 1:5,000	@A3

APPENDIX E – EXISTING SERVICE MAPS



Important Safety Notice: Damage to gas pipelines can result in serious injury or death. Gas network information is provided as a general guide. The exact location and depth of medium or low pressure distribution gas pipes must be verified on site by carrying out necessary investigations, including, for example, hand digging trial holes along the route of the pipe. Service pipes are not generally shown but their presence should always be anticipated.

High pressure transmission pipelines are shown in red. If a transmission pipeline is identified within 10m of any intended excavations then work must not proceed before GNI has been consulted. The true location and depth of a transmission pipeline must be verified on site by a representative of GNI. Contact can be made through 1800 427 747.

All work in the vicinity of the gas network must be completed in accordance with the current edition of the Health and Safety Authority publication, 'Code of Practice For Avoiding Danger From Underground Services' which is available from the Health and Safety Authority (0818 289 389) or can be downloaded at www.hsa.ie.

Legal Notice: Gas Networks Ireland (GNI) and its affiliates, accept no responsibility for the accuracy of any information contained in this document including data concerning location and technical designation of the gas distribution and transmission network (the"Information"). The Information should not be relied on for accurate distance or depth of cover measurements.

Any representations and warranties, express or implied, are excluded to the fullest extent permitted by law. No liability shall be accepted for any loss or damage including, without limitation,direct, indirect or consequential loss, arising out of or in connection with the use or re-use of the Information.

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- Aurora Telecom Duct
- Aurora Telecom Sub Duct
- Aurora Telecom Inserted Gas Pipe

Aurora TELECOM

Aurora Telecom Queries - 01-8926166 (Office Hours)
Aurora_Network_Queries@gasnetworks.ie
Aurora Telecom Emergency Only 1800 427399 / 01 2030120

- Transmission Pipe (High Pressure)
- Transmission Pipe (Construction Issue)
- Distribution Pipe (Medium Pressure)
- Distribution Pipe (Low Pressure)
- Service Pipe (Medium Pressure)
- Service Pipe (Low Pressure)
- Strategic Pipe (Medium Pressure)
- Strategic Pipe (Low Pressure)
- Inserted
- Abandoned Pipe

C=?	Cover (depth in metres)		Pressure Monitor
CP	CP Test Point		Protection (Slabbing)
	End Cap		Protection (Sleeve)
	Hot Tap		Reducer
	Installation		Service Terminator
	Valve		Tee
	Mains Verification**		Transition

** Please contact GNI on 1800-427747 for specific information

DIAL BEFORE YOU DIG 1800 42 77 47 In Emergency call 1800 20 50 50 Gas Networks Ireland

Gas Networks Ireland

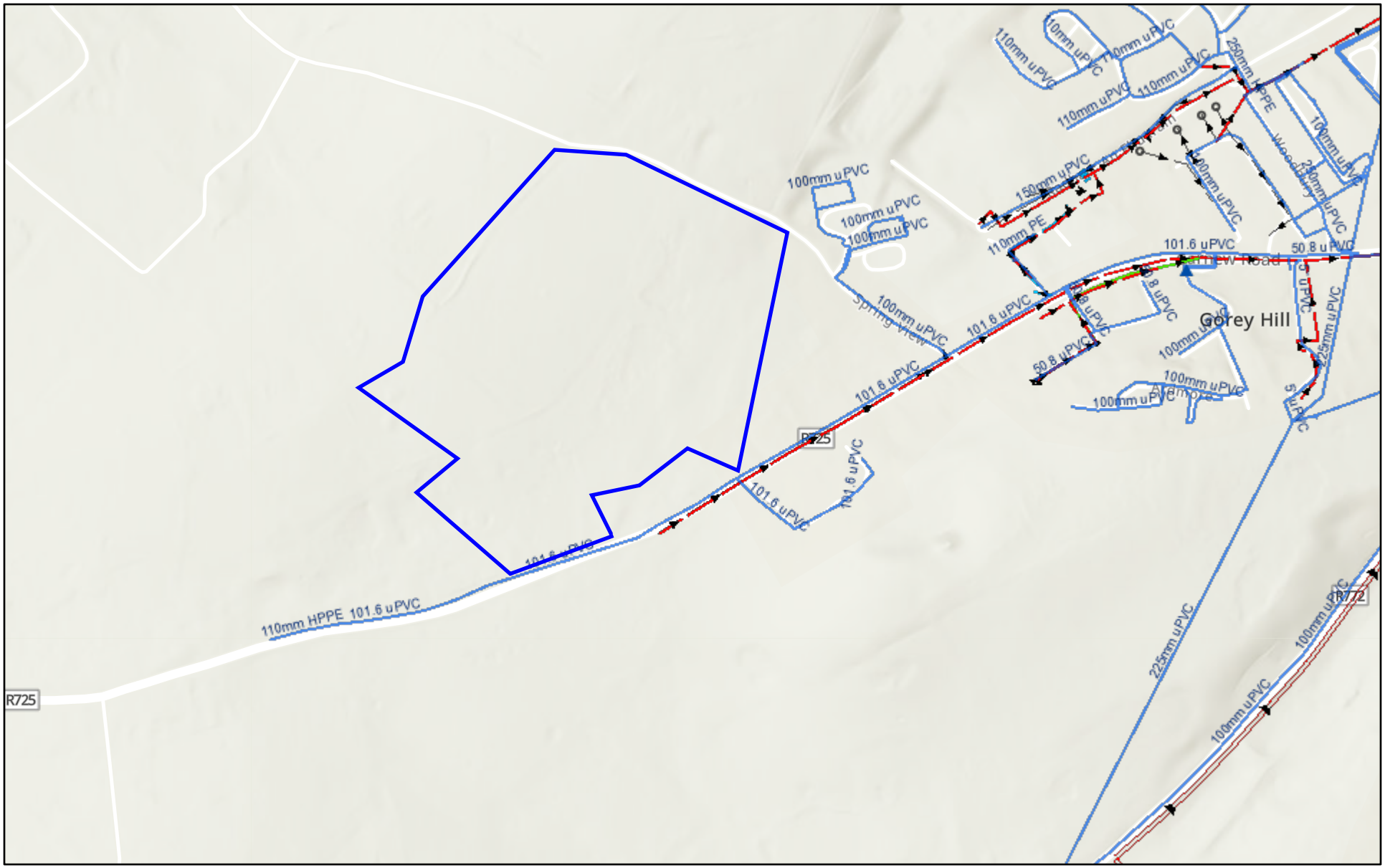
GAS NETWORK INFORMATION

Description: Kilnahue LRD

Location: 713617,659293

Plot Date: 27/06/2025 08:03	Scale: 2500 @ A3
Plotted By: 6604	Ref ID: *6604_27062025080348*

Irish Water - Map - Services



6/25/2025

1:11,754

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA,

- Water Treatment Plant
- Abstraction Point

Reservoir
- Reservoir (Potable Water)
- Reservoir (Raw Water)
- Water Pump Stations

Water Network Structures
- Storage Cell
- Storage Tower
- Dosing Point
- Meter Station
- Water Pump
- Other; Unknown

Private Water Network Structures
- Storage Cell
- Storage Tower
- Dosing Point
- Meter Station
- Water Pump
- Other; Unknown

Water Distribution Mains
- Irish Water
- Private

Trunk Water Mains
- Irish Water
- Private

Sewer Discharge Points
- Outfall
- Overflow
- Soakaway
- Other; Unknown
- Waste Water Treatment plant
- Waste Water Pump station

Sewer Mains
- Gravity - Combined
- Gravity - Foul
- Gravity - Overflow
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Overflow
- Pumping - Unknown
- Syphon - Combined
- Syphon - Foul
- Syphon - Overflow
- Overflow

Sewer Mains (Private)
- Gravity - Combined
- Gravity - Foul
- Gravity - Overflow
- Gravity - Unknown
- Pumping - Combined
- Pumping - Foul
- Pumping - Overflow
- Pumping - Unknown
- Syphon - Combined

ESB Networks

TITLE: 20250630-005_A3

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 30-Jun-2025

** SCALE: 1:2500

** SCALE WHEN PRINTED ON AN A3 PAGE
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

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WARNING

THIS MAP INDICATES THE APPROXIMATE LOCATION OF ESB TRANSMISSION (400KV, 220KV, 110KV, 38KV) AND DISTRIBUTION (20KV, 10KV, 230V/400V) UNDERGROUND CABLES AND OVERHEAD LINES IN THE GENERAL AREA OF THE PROPOSED WORKS. ESB NETWORKS TAKES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE MAP. IT IS THE USER'S RESPONSIBILITY TO INDEPENDENTLY VERIFY THE INFORMATION AND THE LOCATION OF UNDERGROUND CABLES AND OVERHEAD LINES. LOW VOLTAGE (230V/400V) SERVICE CABLES (E.G. HOUSE SERVICES, FACTORY/SHOP SERVICES, PUBLIC LIGHTING LAMP SERVICES, ETC) ARE NOT INCLUDED BUT THEIR PRESENCE SHOULD BE ANTICIPATED. THE DEPTHS OF UNDERGROUND CABLES MUST NEVER BE ASSUMED. BEFORE ANY MECHANICAL EXCAVATION IS UNDERTAKEN, THE ACTUAL LOCATION OF ALL UNDERGROUND ELECTRICITY CABLES MUST BE ESTABLISHED AND VERIFIED ON THE SITE USING:

(A) UP-TO-DATE MAP RECORDS;
(B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES;
(C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'.

REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'.
ESB TAKES NO RESPONSIBILITY FOR AND SHALL BEAR NO LIABILITY, HOWSOEVER ARISING, IN RELATION TO ANY DAMAGE, INJURY/DEATH OR LOSS OF SUPPLY AS A RESULT OF DAMAGE OR INTERFERENCE WITH ITS NETWORKS.

ESB NETWORKS HAS ISSUED THIS MAP AS A PDF DOCUMENT. IF VIEWING A PAPER VERSION OF THIS MAP, THE VIEWER MUST ENSURE THAT IT HAS BEEN PRINTED IN COLOUR TO FIT TO AN A3 (OR LARGER) PAGESIZE AND THAT EACH OF THE COLOURS INDICATED ON THE COLOUR CODE LEGEND ABOVE ARE CLEAR AND DISTINCT FROM EACH OTHER TO MAINTAIN A CORRECT REPRESENTATION OF THE ELECTRICAL NETWORK INFORMATION.

X,Y: 313055 , 159515

X,Y: 314075 , 159515

X,Y: 314075 , 158910

CREAGH SCHO
CREAGH W
RECLOSER KILNAHUE
KILNAHUE LANE
KILNAHUE DOYLE
GOREY HILL N O
GOREY HILL
GOREY HILL W
GOREY HILL SOMERS
178A
177A
178
177B
177
175
172
171
167
166A
1
2
3
4
A1
A2
A3
A3A
3X1/185 XLP
4X185 XLP
4X70 XLP
70/50 AYCY
120/70 AYCY

HIGH VOLTAGE

IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT ESB NETWORKS IN ADVANCE OF WORKS AT 1800 372 757 OR EMAIL DIG@ESB.IE TO AGREE SAFE WORKING PROCEDURES AND NECESSARY CLEARANCES BETWEEN THE LINES AND THE DEVELOPMENT IN ADVANCE OF ANY EXCAVATION.

ADDENDIX F – QBAR CALCULATION & DRAINAGE HYDRAULIC MODEL REPORT

Qbar and Storage Volume			
Project Name	Gorey	**Project Number**	25007
Client	Glenveagh	**Date**	17/10/2025
Site Name	Gorey	**Site Locations**	Gorey, Co.Wexford
Irish Grid Easting	313700	**Irish Grid Northing**	159300
Calculated By	Dayane Muniz	**Approved By**	Daniel Oliveira

AKM DESIGN GROUP.
Innovating tomorrow through design

Description	Value
Soil Type	4
SPR Index	0.47
SAAR (mm)	1101.2
Rain Data Source	Met Éireann
Climate Change Factor (%)	20%
Urban creep allowance factor (%)	10%

Qbar formula

$$Q\ Bar = 0.00108 \times (AREA)^{0.89} \times (SAAR)^{1.17} \times (SOIL)^{2.17}$$

Area = Total site area in km²
SAAR = Standard Average Annual Rainfall in mm
SOIL = The "SPR" index from FSR

Note: Where a site is <0.5km², the Q Bar formula should be applied for 0.5km² and the result factored based on the ratio of the actual site area and the applied area.

Catchment	Description	*Roofs*	*Driveways*	*Roads*	*Garden*	*Open Space*	*Greenroof*	*Other*	Total	Coefficient Runoff
	Runoff	0.900	0.500	0.950	0.200	0.470	-			
A	Gross Area (m²)	21,028	14,553	23,153	25,384	65,135	-	-	**149,254**	0.562
	Impermeable Area (m²)	18,925	7,277	21,996	5,077	30,614	-	-	**83,888**	
B	Gross Area (m²)	1,034	293	2,611	512	2,808	-	-	**7,258**	0.686
	Impermeable Area (m²)	931	146	2,480	102	1,320	-	-	**4,980**	

Area	Gross Area (m²)	Equivalent Impermeable Area (m²)	Coefficient Runoff
Roads & Footpath	25,764	24,476	0.950
Permeable Parking	14,846	7,423	0.500
Roof	22,062	19,856	0.900
Open Spaces	67,943	31,933	0.470
Green areas & Gardens	25,896	5,179	0.200
Others	-	-	-
Total	**156,511**	**88,867**	0.568

Area	Gross Area (m²)	Qbar (l/s)	Attenuation Volume m³ (+20% C.C. + 10% U.C.)
Catch A	140,391	115.16	5,090.21
Catch B	16,120	13.22	584.47
Total	**156,511**	**128.39**	**5,674.68**