APPENDIX 7.1 ENVIRONMENTAL ASSESSMENT (SITE INVESTIGATION)

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ENVIRONMENTAL ASSESSMENT

DUBLIN CENTRE

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1. INTRODUCTION

In 2006 O' Callaghan Moran & Associates (OCM) conducted a preliminary environmental assessment of the proposed Dublin Centre site located between Upper O'Connell Street and Moore Street and between Parnell Street and Henry Street, Dublin. The proposed development comprises a mixed retail and commercial development over deep basement.

The assessment involved a desk study of available information on historic land use and a site inspection, based on which OCM prepared a Map outlining areas of potential high, moderate and low risk of contamination (Ref.: Figure 1).

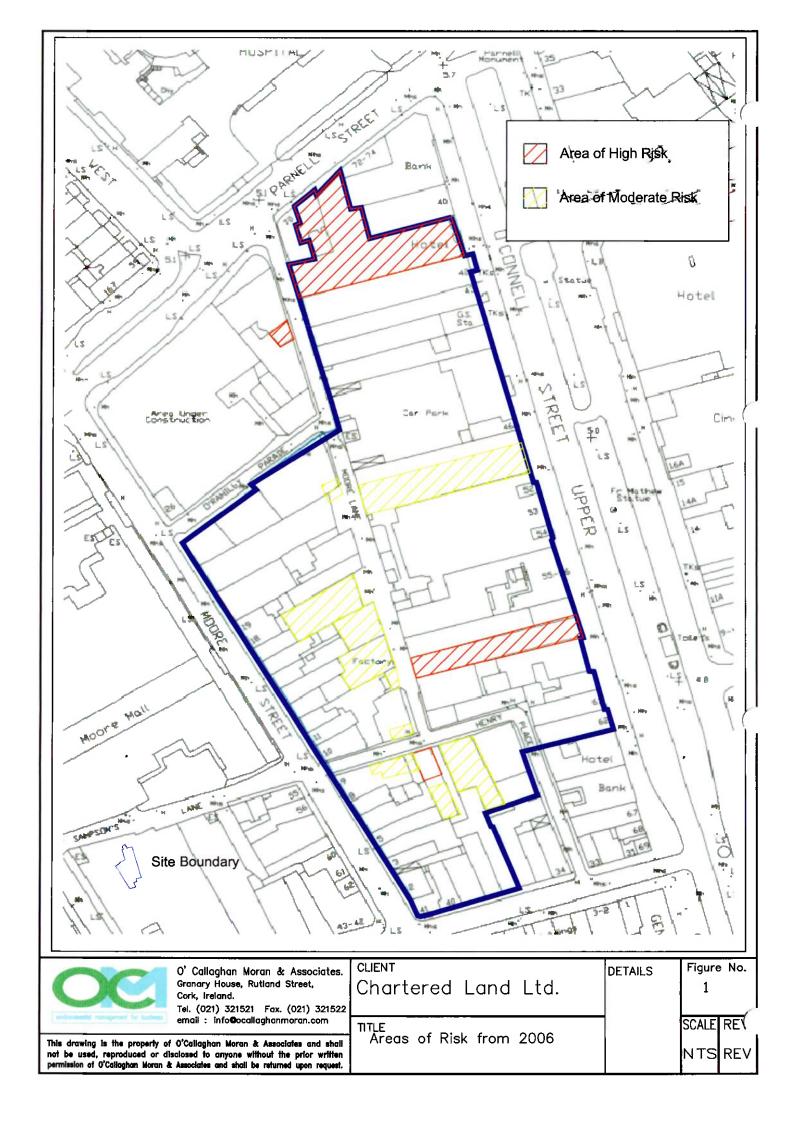
In 2008 a joint geotechnical and environmental site investigation was undertaken comprising the excavation of trial pits, the installation of boreholes in the subsoils and bedrock and the collection and testing of soil and groundwater samples. The geotechnical investigations were supervised by AGL while the environmental elements of the investigation were supervised by OCM.

The purpose of the environmental investigation was to identify if there was contamination in the subsoils or groundwater; identify appropriate management options for any contaminated subsoils that may have to be removed from the site during the redevelopment; and establish the status of groundwater quality. This report presents the findings of the environmental investigation.

1.1 Investigation Scope

The scope comprised: -

- Collection of samples of the fill material and the underlying subsoils for laboratory analysis to establish if these materials have been impacted by historical activities;
- Characterisation of the impacted soils, based on the laboratory testing, to identify suitable off-site disposal/recovery outlets for any soils that have to be removed;
- Collection and analysis of groundwater samples from the subsoils and bedrock to
 provide data for an application to Dublin City Council for a trade effluent discharge
 license for dewatering during the construction of the basement.



1.1.1 Limitations

While every effort was made to target the areas of concern identified in OCM 2006 Report, the intrusive investigations were confined to open areas in the middle of the site and around the site parameter. This was due to the fact that most of the premises within the development footprint were either still occupied, or in the case of those that had been vacated, had not yet been demolished. Therefore it is possible that there areas of localized contamination at the site that have not been identified in this assessment.

2. SITE DESCRIPTION

2.1 Location

Dublin Centre is bounded to the east by O'Connell Street Upper, to the North by Parnell Street and O'Rahilly Parade, to the south by Henry Street and to the west by Moore Street and Moore Lane. Henry Place is also part of the development area as shown on Figure 2.1.

2.2 Site Layout and Current Use

In 2006 OCM conducted a site walkover to determine the use of the buildings at that time. The occupier of each building and type of activity carried out therein are listed in Table 2.1.

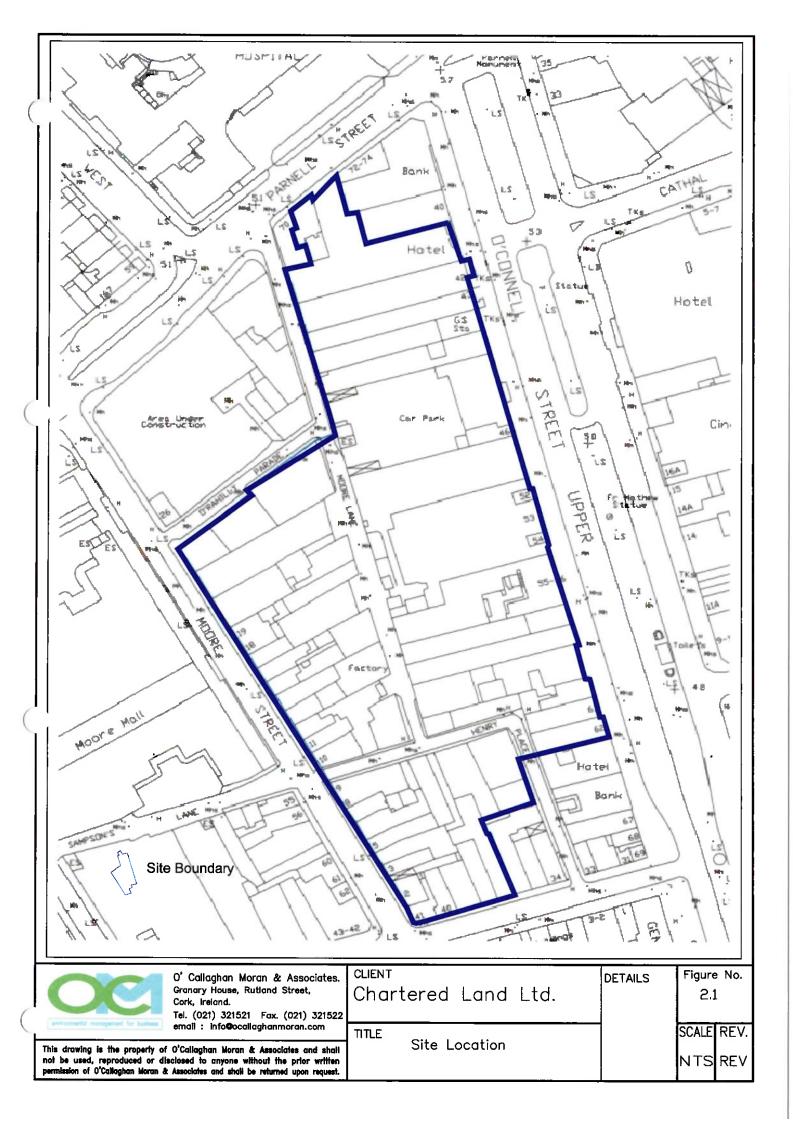


Table 2.1 Name and Address of Occupiers within the subject area

| Address | Name | Type of Activity |
|--------------------------------|---------------------------------|--|
| 41 – 42 O'Connell Street Upper | Royal Dublin Hotel | Hotel |
| 43 O'Connell Street Upper | Ned Kelly's | Snooker Hall |
| 44 O'Connell Street Upper | An Garda Síochana | Offices |
| ** | Vacant | |
| | Vacant | |
| | Londis | Grocery/Newsagent |
| | Dr. Quirkey's | Amusement Arcade |
| 52 O'Connell Street Upper | Slattery's | Camera Shop |
| 52 – 54 O'Connell Street Upper | Carlton Cinema (Closed) | Cinema |
| 55 – 56 O'Connell Street Upper | Dr. Quirkey's | Amusement Arçade |
| 57 – 58 O'Connell Street Upper | Carroll's | Irish Gift Shop |
| 58 O'Connell Street Upper | Profiles (Above Carroll's) | Ladies Gym |
| 59 – 60 O'Connell Street Upper | Dublin Bus (Closed) | Office |
| 61 O'Connell Street Upper | Flanagan's | Restaurant |
| 62 O'Connell Street Upper | McDonalds | Fast Food Restaurant |
| | | |
| 37 Henry Street | The Card Company | Card shop |
| 38 Henry Street | NoName | Clothes shop |
| 39 Henry Street | Game | Electronic Game Shop |
| 40 Henry Street | Simon Hart | Shoe Shop |
| 41 Henry Street | McGiveney's | Optician & Jewellers |
| 4 Henry Place | Unknown possibly The Mint | Tattoo parlour |
| 5 – 9 Henry Place | Han Yang Asian Market | Asian Food Shop |
| 1 Moore Street | Everyday Seafood & Grocery | Grocery shop |
| 1 Moore Street (upstairs) | , | Hairdresser |
| 3 Moore Street | Paddy Power | Bookmaker |
| 4 Moore Street | Bryan's (Closed) | Shoe Repair/Key Cutting |
| 5 Moore Street | Doyle's (Closed) | Bingo/ Hardware |
| 6 Moore Street | Talk Cents | Internet/Phone Shop |
| 7 Moore Street | Troy's Butchers | Butcher's Shop |
| | Hair Extension Master / Central | Supermarket and |
| 8 – 9 Moore Street | Supermarket (Closed) | Hairdressers |
| 10 Moore Street | Rong Xing | Chinese Supermarket |
| 11 Moore Street | Home Store | Hardware/Homeware shop |
| 12 Moore Street | Oceanic Superstore | Asian Food Shop |
| 13 Moore Street | Pat's Household | Homeware shop |
| 14 Moore Street | Charity Hair Studio | Hairdressers |
| 15 Moore Street | Larmints Paylink | Money Transfer shop |
| 16 Moore Street | Plunketts | Closed |
| 17 Moore Street | Mobile Phone Centre | Phone / electronic shop |
| 18 Moore Street | Crystal Superstores | Afro-Caribbean shop |
| 19 Moore Street | American Design Wears | Basketball & sports shop |
| 19 MOOLE SHEEL | American Design wears | Chinese Restaurant & |
| 20 Moore Street | Unknown | Hairdressers upstairs |
| 21 Moore Street | Madina Asian Food Co. | Asian Food Market |
| | | Restaurant |
| 22 Moore Street | China House | |
| 23 Moore Street | Vacant | Possibly offices upstairs |
| 1 – 2 O'Rahilly Parade | Dublin City Council | Waste management equipment storage |
| 3 – 8 O'Rahilly Parade | Dublin City Council | Storage Containers for the Moore St. Traders |

O'Connell Street Upper

The lots on Upper O'Connell Street were occupied by eight retail outlets; the Royal Dublin Hotel and two restaurants (Flanagan's and McDonalds).

Parnell Street

The Royal Dublin Hotel was the only lot on Parnell Street.

Henry Street

There were 5 No. retail outlets in 37 to 41 Henry Street.

Henry Place

Two buildings on Henry Place were being used for retail purposes (one Asian food market and one tattoo parlour). The remaining area was occupied by derelict buildings. The rear gardens or yard areas of the lots on O'Connell Street form the eastern and northern boundary of Henry Place.

Moore Street

All of the buildings on Moore Street where occupied were retail outlets, which include restaurants, general shops and food markets. Of the 23 buildings 4 were vacant.

Moore Lane

The rear of the buildings on O'Connell Street Upper form the eastern boundary of Moore Lane. Derelict buildings and yards and the rear of the buildings on Moore Street form the western boundary of Moore Lane.

O'Rahilly Parade

O'Rahilly Parade is occupied by two yards. 1-2 which are used by Dublin City Council as a storage area for bins and street cleaning equipment. 3 to 8 O'Rahilly Parade was being used by Dublin City Council as a storage area for the Moore Street Traders.

2.3 Services

OCM understand that heating for all of the buildings is either by gas supplied by Bord Gais and/or individual electric heating systems. OCM did not observe any heating oil storage tanks

in the rear of any of the premises. While it is unlikely that oil is widely used for heating purposes, it is possible that there may be some individual heating oil storage tanks in use.

Water is supplied from the Dublin City Council mains supply. OCM did not identify the presence of any supply wells and a review of Geological Survey of Ireland records indicates that there are no water supply wells in the area.

Sanitary wastewater discharges to the Dublin City Council foul sewer, while storm water is discharged to the municipal Storm Sewer. No records of any Trade Effluent Discharge Licences were identified in the review of Dublin City Council files, the details of which are discussed in Section 3.

An ESB transformer station was identified in the basement of 40 and 41 O'Connell Street Upper during OCMs 2006 assessment. It is understood that the transformer was installed in the mid 1960's, but OCM could not establish either the exact installation time or whether it is still in place. This transformer, if present, may have coolants containing PCBs, which would require specialist handling.

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3. PHYSICAL SETTING

3.1 Geology

Information on the local and regional geology was obtained from the GSI databases and the geotechnical investigation, which comprised the installation of cable tool percussion (shell & auger) and rotary cores boreholes. The site investigation findings are discussed in detail in Section 4.

3.1.1 Bedrock

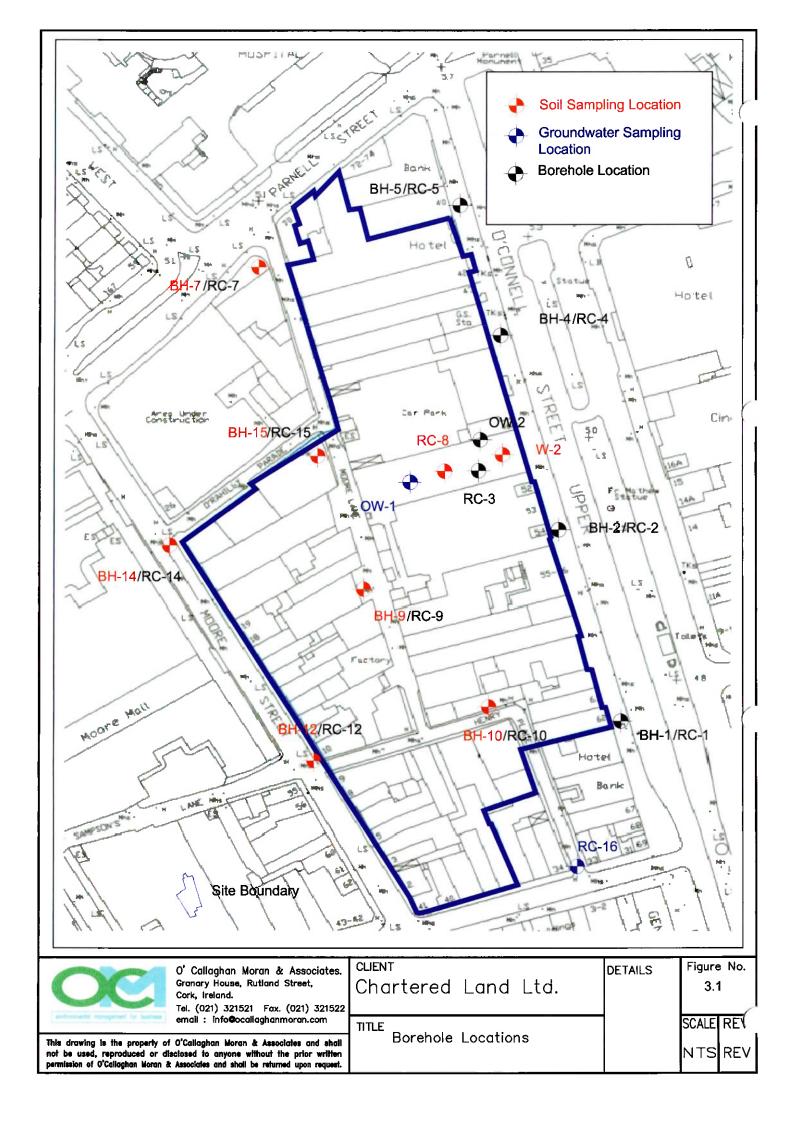
The GSI bedrock "Geology of Kildare – Wicklow", Map 1994 states that the subject area is underlain by dark grey to black limestones and shales of the Calp Limestones. Calp units typically consist of dark grey, fine grained, graded limestone with interbedded black, poorly fossiliferous shales. The limestone bed thickness, grain size, colour and proportion of shale vary widely.

The borehole locations used for environmental sampling purposes are shown on Figure 3.1 and the complete map showing all the site investigation locations is included in Appendix 1. The borehole logs are included in Appendix 2.

The rotary core borehole logs indicate that the bedrock is mostly interbedded black calcareous shale, argillaceous limestone and siliceous limestone. In OW-1 and OW-2, located in the centre of the site, the bedrock is described as limestone. In BH-5 the bedrock encountered was interbedded limestone and shale and grey blue limestone. The depth to bedrock ranged from 12.6 m below ground level (bgl) for RC-16 to 27.3 m bgl for RC-4 in the northeast of the site.

3.1.2 Subsoils/Quaternary Geology

According to the quaternary map of Dublin, the area is underlain by made ground, alluvium deposits close to the Liffey and glacial till. Much of the central Dublin area is underlain by fill material comprising gravels and clays interspersed with glass pottery and in some cases ash, which was deposited in the 17th and 18th century particularly in the low lying areas close to the Liffey.



The borehole logs indicate that the subsoils range in thickness from between 12.6 m to 27.3 m across the site and comprises fill material underlain by natural ground. The fill material ranges from 2 m thick at RC-8 to 5 m at BH-4 and is thickest at the O'Connell Street, eastern side of the site. The fill is described as brown grey slightly gravelly clay with cobbles and fragments of brick and concrete. Underneath the fill material, the natural ground comprises mostly gravels underlain by a brown clay.

3.2 Hydrogeology

3.2.1 Aquifer Classification and Vulnerability

The bedrock aquifer beneath the site is classified locally by the GSI as a locally important aquifer (LI) which is moderately productive only in local zones, indicating that water movement through the bedrock is very slow and along short flow paths. The limited groundwater movement within the rock tends to be restricted to the surficial weathered horizons (top1-3m) or to non-extensive fractured zones. These zones tend to have a limited hydraulic continuity, low storage capacity and potential yield.

It is likely that groundwater flow locally is from north to south toward the River Liffey which is approximately 500 m to the south of the site.

Vulnerability is defined by the GSI as the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. The GSI uses four groundwater vulnerability categories – extreme (<3m), high (3-5m), moderate (5-8m) and low>10m) - for mapping purposes and in the assessment of risk to groundwaters. Groundwater is most at risk where the subsoils are either absent or thin. The data from the borehole logs indicates that the vulnerability of the bedrock aquifer is moderate to low.

3.2.2 Hydrogeological Risk Assessment

The development site is predominantly covered by paved areas, roofs roads and pavement, but there may be some very small unpaved areas to the rear of some of the buildings. Most of the incident rainfall runs off to storm sewer, with infiltration to ground limited to open green or unpaved yard areas.

Beneath the site the subsurface materials comprise made ground, gravels and clay. The thickness of these materials above the bedrock according to the borehole logs ranges from 12.6-23.3 m. It is likely therefore that any impacts on the subsurface associated with historical landuse are localised as vertical migration of contamination to the bedrock aquifer will have been greatly inhibited by the type and thickness of the subsoils and in particular the brown clay underlying the gravels.

The development will involve deep excavation into the bedrock will be opened at the site. OCM understand that groundwater pumping tests have been undertaken separately by AGL Consulting Engineers to assess the impacts of dewatering on the local hydrogeological conditions. The impact of dewatering is not therefore been discussed in this report, except in relation to the quality of the groundwater that will be discharged during the dewatering activities.

Post development, the extent of hard standing will be similar to the existing conditions. Therefore the amount of direct recharge as a result of rainfall will be very low and similar to the existing situation.

4. SITE INVESTIGATION

4.1 Sample Locations

The geotechnical investigation comprised the installation of eleven (11) shell and augur boreholes and fifteen (15) rotary core boreholes. The locations are shown on Figure 3.1. The environmental investigation involved the collection of samples of the fill material and underlying natural ground and groundwater samples from selected boreholes identified by OCM.

Fill and subsoil samples were collected from eight boreholes, BH-7, 9, 10, 12, 14, 15, RC-8 and W-2. Groundwater samples were collected at both RC-16 and OW-1, where two standpipes were located with one in the subsoil and one in the bedrock aquifer.

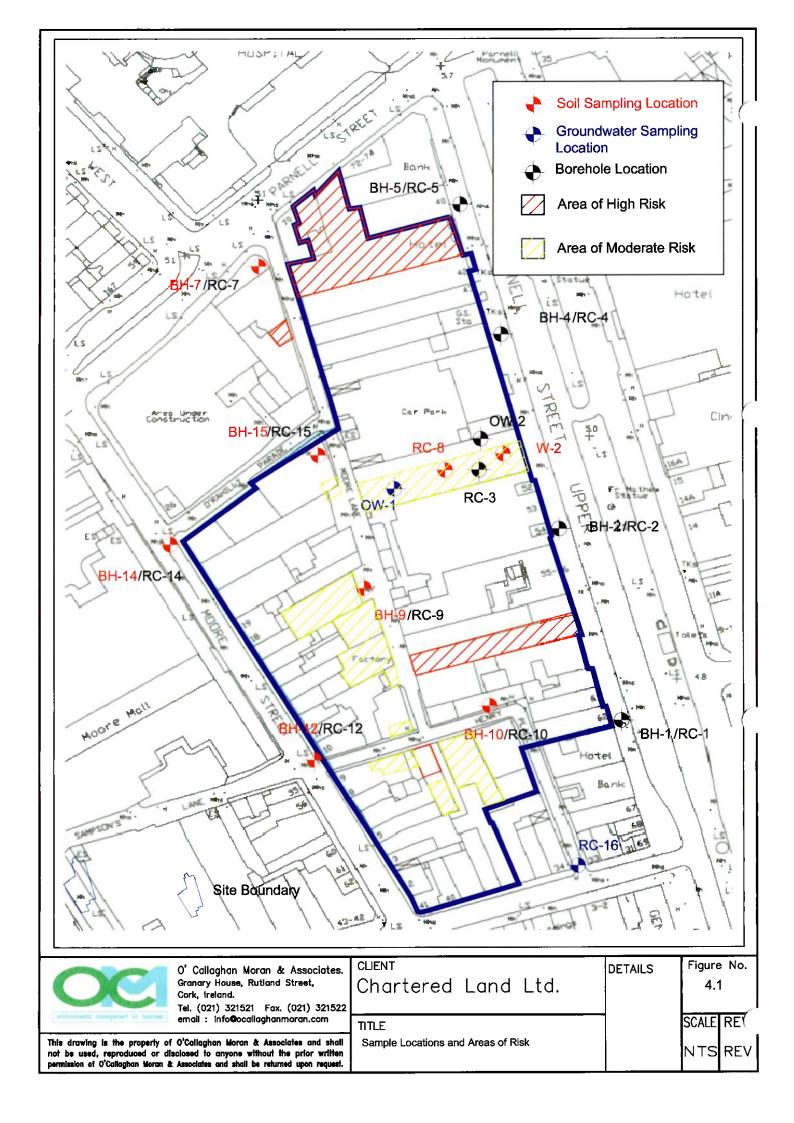
As none of the buildings identified in the 2006 assessment had been demolished, the boreholes had to be positioned in open areas and around the site perimeter and could not be located in all of the risk areas identified in the 2006 assessment. Figure 4.1 shows the location of the boreholes and the areas of risk identified in the assessment. This meant that only W-2 and RC-8 were located directly in an area identified in 2006 assessment as being at risk. Both were in an unpaved area used as a staff car park and storage area for Dr. Quirke's Emporium, which had been identified as being at moderate risk.

BH-7 was located on Parnell Street within 10 m of the rear entrance of the Royal Dublin Hotel which was considered an area of high risk in the 2006 site assessment. BH-9 was located directly beside buildings on Moore Lane, which had been designated at moderate risk. On Henry Place BH-10 was located across the lane from areas that had been designated at moderate and high risk. The remainder of the boreholes BH-12, 14 and 15, were considered to provide a representative spread of samples throughout the site.

4.2 Borehole Installation

The subsoil boreholes were drilled using a shell and augur (cable tool percussion) drill rig. The rotary core boreholes were drilled using a rotary core drill rig. All boreholes were drilled by IGSL and were logged for geotechnical purposes by IGSL personnel.

The installation of the boreholes from which samples for environmental testing purposes were collected were supervised by an OCM scientist and logged in accordance with BS5930. The Borehole logs are included in Appendix 2.



4.3 Soil

4.3.1 Sampling

The purpose of the soil sampling was to establish the presence or absence of contamination and to characterise the fill and subsoils. The samples were collected in accordance with OCM soil sampling protocol, a copy of which is included in Appendix 3.

4.3.2 Laboratory Analysis

All samples were sent to the STL laboratory in Blanchardstown, Dublin for analysis. The range of parameters tested was based on the nature of the historical site activities. In addition selected samples were tested for a range of parameters specified in the EU Council Decision establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.

The Decision specifies Waste Acceptance Criteria (WAC) for a range of inorganic and organic parameters that define whether a waste is suitable for disposal to an inert, non-hazardous or hazardous waste landfill. Materials that comply with the inert WAC are deemed to be essentially inert and present a minimal environmental risk.

Three (3) samples of the fill material from BH-7, 9 and 10 were analysed for Total Petroleum Hydrocarbons (TPH), BETX (benzene, toluene, ethylbenzene and xylene), PAH (polycyclic aromatic hydrocarbons) and metals (arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, tin, selenium and zinc).

Nineteen (19) samples, of the fill and natural ground from, BH-7, 9, 10, 12, 14, 15, RC-8 and W-2, were tested for the WAC, which included Total Organic Carbon (TOC), BETX, PCBs (polychlorinated biphenyls, 7 congeners), Mineral Oil (C10 to C40) and PAH sum of 17. They were also subjected to leach testing at a liquid to solid ratio of 10:1 and the leachate analysed for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, tin, selenium, zinc, chloride, fluoride, sulphate, phenols, dissolved organic carbon and total dissolved solids.

Details of the sample points, sample depth, nature of the sample and analytical tests are presented in Table 4.1

Table 4.1

| | Sur | nmary of Soils Sar | mples | 770 | | | | |
|---------------|----------------|--------------------|--------------|-----------------|--|--|--|--|
| Borehole Name | Sample Type | Sample Type | Sample Depth | Type of Subsoil | | | | |
| | Fill Material | Soil | 0.5-1 m | | | | | |
| BH-7 | Natural Ground | WAC | 4-5 m | Gravel | | | | |
| | Natural Ground | WAC | 12-13m | Gravel | | | | |
| ВН-9 | Fill Material | Soil | 0.4-0.8m | | | | | |
| БП-9 | Natural Ground | WAC | 4-5m | Gravel | | | | |
| BH-10 | Fill Material | Soil | 1.7.2.5m | | | | | |
| | Fill Material | WAC | 0.5-1m | | | | | |
| BH-12 | Fill Material | WAC | 3-4m | | | | | |
| DR-12 | Natural Ground | WAC | 4-5m | Clay | | | | |
| | Natural Ground | WAC | 8-10m | Clay | | | | |
| | Fill Material | WAC | 0.5-1m | | | | | |
| | Fill Material | WAC | 1-2m | | | | | |
| BH-14 | Fill Material | WAC | 2-3m | | | | | |
| | Natural Ground | WAC | 3-4m | Clay | | | | |
| | Natural Ground | WAC | 8-10m | Gravel | | | | |
| RC-8 | Fill Material | WAC | 0.5-1m | | | | | |
| KC-0 | Fill Material | WAC | 1-2m | | | | | |
| W-2 | Fill Material | WAC | 0.5-1m | | | | | |
| ∀∀ -∠ | Fill Material | WAC | 1-2m | | | | | |

4.3.3 Results

The results of analysis of three solid samples of the fill material are shown in Table 4.2. The Table includes, for comparative purposes, the EU Council Decision WAC and the Dutch Government Soil Quality Standards commonly referred to as the Dutch List. These guidelines specify two categories, a target level (D) and an intervention level (I). The (D) level is considered representative of background conditions. The (I) level is one at or above which remedial action may be considered necessary depending on the potential environmental exposure risk. Many Irish Local Authorities use these standards to assess the potential for contamination. These samples were also compared with the EPA typical range for non-polluted soils for major elements and trace elements.

TPH was detected in BH-7 (180 mg/kg) and in BH-9 (150 mg/kg). Although this is above the Dutch D limit of 50 mg/kg they are considerably below the Dutch I limit of 5000 mg/kg and also below the inert WAC of 500 mg/kg.

Cadmium was detected in BH-9 and BH-10 at levels of 1.2 mg/kg and 1.6 mg/kg respectively. These are slightly above the Dutch D limit of 0.8 mg/kg, but below the I limit of 12 mg/kg. In BH-9, the mercury level (0.34 mg/kg) is marginally above the Dutch D limit of 0.3 mg/kg. All the remaining heavy metals were below the Dutch D limit and within the EPA range for non-polluted soils.

Table 4.2 Soil Results Dublin Centre 2008

| Parameter Sample Depth 0.5-1m Units Units 1.6 Arsenic mg/kg 1.6 Barium mg/kg 150 Cadmium mg/kg 1.7 Chromium mg/kg 1.1 Copper mg/kg 1.9 Iron mg/kg 4.2 Manganese mg/kg 4.2 Mercury mg/kg 2.4 Nickel mg/kg 2.4 Tin mg/kg <2.0 Zinc mg/kg 68 Thr Co-C40 mg/kg 180 | | | - | 7 | Daylok I | |
|--|------------|----------|----------------------------|--------|----------|-----------|
| y mg/kg mg/kg mg/kg m mg/kg m mg/kg se mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg c40 mg/kg | _ | 1.7-2.5m | for Non- polluted Soils | Values | values | for Inert |
| ### ### #### ######################### | 1.6 1.6 | 1.7 | 0.2-3 | 3 | 15 | 90.0 |
| n mg/kg m mg/kg m mg/kg | 16 12 | 13 | 1.0-50 | 29 | 55 | 0.5 |
| ### ################################## | 150 72 | 79 | NE | 160 | 625 | 20 |
| ### #### ############################# | 0.65 1.2 | 1.6 | 0.1-1 | 8.0 | 12 | 0.04 |
| ### ### ### ### #### #### ############ | 11 14 | 14 | 5-250 | 100 | 380 | 0.5 |
| ### ### ############################## | 19 28 | 30 | 2-100 | 36 | 190 | 2 |
| .se mg/kg | | 25000 | 100005-00001 | | | |
| mg/kg mg/k | 42 79 | 59 | 2.0-80 | 85 | 530 | 0.5 |
| mg/kg mg/kg mg/kg mg/kg mg/kg | 830 1100 | 1500 | 20-3000 | NE | NE | - |
| mg/kg mg/kg mg/kg ng/kg | <0.25 0.34 | <0.25 | 0.3-0.8 | 0.3 | 10 | 0.01 |
| mg/kg mg/kg C6-C40 mg/kg | 24 31 | 37 | 0.5-100 | 35 | 210 | 0.4 |
| mg/kg mg/kg | <2.0 3.5 | 3.7 | 1.0-40 | NE | 006 | - |
| mg/kg | 98 89 | 94 | 10-200 | 140 | 720 | 4 |
| | 180 150 | <50 | NE | *05 | *0005 | 200 |
| BTEX mg/kg <0.2 | <0.2 <0.2 | <0.2 | NE | NE | 100 | 9 |
| PAHs (sum of 10) mg/kg 17.3 | 17.3 2.9 | 0.3 | NE | 1 | 40 | |
| PAHs (sum of 16) mg/kg 23.0 | 23.0 3.7 | <1.0 | NE | NE | | 100 |

*Denotes limit for mineral oil

In BH-7 and BH-9 PAHs (sum of 10) the PAH, 17.3 mg/kg and 2.9 mg/kg respectively, exceeded the D value of 1 mg/kg, but are well below the 100 mg/kg limit applied at Irish inert waste disposal landfills.

Waste Acceptance Criteria (WAC) Testing

The results of the WAC testing of the fill material and the natural susbsoils are shown in Table 4.3 and 4.4 respectively. The Tables include the WAC for inert and non-inert landfills. The EU Council Decision does not include a WAC for PAH, but allows individual member states to apply their own limits. The limit used in this assessment is derived from the Waste Licence issued by the EPA for an inert landfill in County Dublin.

TPH was detected above the inert WAC (500 mg/kg) in four of the fill material samples-RC-8 (510 mg/kg and 1800 mg/kg); BH-12 (640 mg/kg), and W-2 (5000 mg/kg).

Antimony exceeded the inert WAC of 0.06 mg/kg in the upper fill sample of OW2 (0.36 mg/kg), but was less than the non-hazardous WAC (0.7 mg/kg). The chromium level in BH-14 (0.53 mg/kg) was slightly above the inert WAC of 0.5 mg/kg, but well below the non-hazardous WAC of 10 mg/kg.

Mercury was detected in samples of the fill taken in BH-12 (0.5-1m) and BH-14 (2-3m) and the natural ground (BH 7 (4-5m) marginally above the inert WAC of 0.01 mg/kg, but below the non-hazardous WAC of 0.2 mg/kg.

PAH levels greater that the inert WAC (100 mg/kg) were detected in both samples from OW-2, 230 mg/kg and 570 mg/kg respectively and the lower sample from RC-8 (280 mg/kg). There is no non-hazardous WAC for PAH.

PCBs were only detected in one sample at RC-8 (0.5-1m) at 0.028 mg/kg. This is considerably below the EU limit of 1 mg/kg.

Sulphate levels exceeded the inert WAC (1000 mg/kg) in two samples from RC-8, however the levels -15000 mg/kg (0.5-1m) and 14000 mg/kg (1-2m) respectively- were less than the non-hazardous WAC of 20,000 mg/kg. The TDS of both samples from RC-8 exceeded the inert WAC, but were less than the non-hazardous WAC.

Table 4.3 Fill Material WAC Dublin Centre 2008

| | Sample I.D. | BH-12 | BH-12 | BH-14 | BH-14 | EU Limits for Inert | EU Limits for |
|--------------------------|-------------------|---------|---------|---------|---------|---------------------|---------------------------|
| Parameter | Depth (m) Unit | 0.5-1m | 3-4 m | 0.5-1m | 1-2m | Landfill | Non-Hazardous Landfill |
| Arsenic | mg/kg | <0.50 | <0.50 | <0.50 | <0.50 | 0.5 | 2 |
| Barium | mg/kg | 0.19 | 0.033 | 0.12 | 0.097 | 20 | 100 |
| Cadmium | mg/kg | < 0.001 | < 0.001 | < 0.001 | < 0.001 | 0.04 | 1 |
| Chromium | mg/kg | 0.33 | <0.10 | 0.53 | 0.48 | 0.5 | 10 |
| Copper | mg/kg | < 0.10 | < 0.10 | 0.24 | 0.44 | 2 | 50 |
| Mercury | mg/kg | 0.016 | < 0.003 | 0.0051 | 0.0068 | 0.01 | 0.2 |
| Molybdenum | mg/kg | 0.084 | 0.31 | 0.27 | 0.43 | 0.5 | 10 |
| Nickel | mg/kg | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.4 | 10 |
| Lead | mg/kg | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.5 | 10 |
| Antimony | mg/kg | < 0.30 | < 0.30 | < 0.30 | < 0.30 | 0.06 | 0.7 |
| Selenium | mg/kg | < 0.060 | < 0.060 | < 0.060 | < 0.060 | 0.1 | 0.5 |
| Zinc | mg/kg | <0.10 | <0.10 | <0.10 | <0.10 | 4 | 50 |
| Chloride | mg/kg | <25 | <25 | <25 | 29 | 800 | 15000 |
| Fluoride | mg/kg | 3 | 2.3 | <2 | 2 | 10 | 150 |
| Sulphate | mg/kg | 910 | 300 | 190 | 820 | 1,000 | 20000 |
| Phenols | mg/kg | < 0.50 | < 0.50 | < 0.50 | < 0.50 | 1 | |
| Dissolved Organic Carbon | mg/kg | 26 | 22 | 58 | 69 | 500 | 800 |
| Total Dissolved Solids | mg/kg | 3200 | <2000 | 2900 | <2000 | 4000 | 60000 |
| Total Organic Carbon | % | 5.3 | 3 | 4.4 | 3.8 | 3* | |
| BTEX | mg/kg | < 0.5 | < 0.5 | < 0.5 | < 0.5 | 6 | |
| PCBs | mg/kg | < 0.01 | < 0.01 | < 0.01 | < 0.01 | 1 | The state of |
| ТРН | mg/kg | 640 | 170 | 99 | 180 | 500** | - |
| PAH (16) | mg/kg | 6.6 | <1.0 | 8.1 | 8.3 | - | - |
| PAH (17). | mg/kg | 6.6 | <1.0 | 8.1 | 8.3 | Murphy's 100mg/kg | |

^{*}If DOC is less than 500 then a higher limit can be accepted
** Limit is for Mineral Oil

Table 4.3 continued Fill Material WAC Dublin Centre 2008

| | Sample I.D. | BH-14 | BH-15 | BH-15 | BH-8 | EU Limits for Inert | EU Limits for |
|--------------------------|-------------------|---------|---------|---------|---------|---------------------|---------------------------|
| Parameter | Depth (m) Unit | 2-3m | 0.5-1 | 1.0-2.0 | 0.5-1 | Landfill | Non-Hazardous Landfill |
| Arsenic | mg/kg | <0.50 | <0.5 | <0.5 | <0.5 | 0.5 | 2 |
| Barium | mg/kg | 0.13 | 0.06 | 0.055 | 0.21 | 20 | 100 |
| Cadmium | mg/kg | < 0.001 | < 0.001 | < 0.001 | < 0.001 | 0.04 | 1 |
| Chromium | mg/kg | 0.17 | 0.18 | < 0.1 | <1 | 0.5 | 10 |
| Copper | mg/kg | 0.47 | 0.36 | 0.28 | <1 | 2 | 50 |
| Mercury | mg/kg | 0.012 | 0.0035 | 0.0049 | < 0.003 | 0.01 | 0.2 |
| Molybdenum | mg/kg | 0.34 | 0.16 | 0.13 | 0.1 | 0.5 | 10 |
| Nickel | mg/kg | 0.12 | 0.15 | 0.14 | <1 | 0.4 | 10 |
| Lead | mg/kg | < 0.10 | 0.42 | 0.43 | <1 | 0.5 | 10 |
| Antimony | mg/kg | < 0.30 | < 0.3 | < 0.3 | < 0.3 | 0.06 | 0.7 |
| Selenium | mg/kg | < 0.060 | <0.06 | < 0.06 | < 0.06 | 0.1 | 0.5 |
| Zinc | mg/kg | < 0.10 | <0.1 | 0.13 | <1 | 4 | 50 |
| Chloride | mg/kg | 54 | <25 | <25 | 43 | 800 | 15000 |
| Fluoride | mg/kg | <2 | 2.3 | <2 | <2 | 10 | 150 |
| Sulphate | mg/kg | 140 | 500 | 190 | 15000 | 1,000 | 20000 |
| Phenols | mg/kg | < 0.50 | < 0.5 | <0.5 | < 0.5 | 1 | |
| Dissolved Organic Carbon | mg/kg | 82 | 62 | 36 | 52 | 500 | 800 |
| Total Dissolved Solids | mg/kg | <2000 | 4200 | <2000 | 24000 | 4000 | 60000 |
| Total Organic Carbon | % | 3.6 | 3.6 | 5.2 | 3.1 | 3.33% | - |
| BTEX | mg/kg | < 0.5 | < 0.5 | < 0.5 | < 0.5 | 6 | E |
| PCBs | mg/kg | < 0.01 | < 0.01 | <0.01 | 0.028 | 1 | • |
| Mineral Oil | mg/kg | <50 | 120 | 86 | 510 | 500 | |
| PAH (16) | mg/kg | <1.0 | 4.2 | 1.4 | 44 | | |
| PAH (17). | mg/kg | <1.0 | 4.2 | 1.4 | 44 | Murphy's 100mg/kg | |

^{*}If DOC is less than 500 then a higher limit can be accepted
** Limit is for Mineral Oil

Table 4.3 continued Fill Material WAC Dublin Centre 2008

| | Sample I.D. | BH-8 | W-2 | W-2 | EU Limits for Inert | EU Limits for |
|--------------------------|-------------|---------|---------|---------|---------------------|---------------|
| Parameter | Depth (m) | 1.0-2.0 | 0.5-1 | 1.0-2.0 | -X-96820 | Non-Hazardous |
| | Unit | 1.0-2.0 | | | Landfill | Landfill |
| Arsenic | mg/kg | < 0.5 | < 0.5 | <0.5 | 0.5 | 2 |
| Barium | mg/kg | 0.25 | 0.24 | 0.18 | 20 | 100 |
| Cadmium | mg/kg | < 0.001 | < 0.001 | < 0.001 | 0.04 | 1 |
| Chromium | mg/kg | <1 | 0.21 | <1 | 0.5 | 10 |
| Copper | mg/kg | <1 | 0.34 | <1 | 2 | 50 |
| Mercury | mg/kg | < 0.003 | < 0.003 | < 0.003 | 0.01 | 0.2 |
| Molybdenum | mg/kg | 0.095 | 0.066 | 0.081 | 0.5 | 10 |
| Nickel | mg/kg | <1 | 0.13 | <1 | 0.4 | 10 |
| Lead | mg/kg | <1 | 0.43 | <1 | 0.5 | 10 |
| Antimony | mg/kg | <0.3 | 0.36 | <0.3 | 0.06 | 0.7 |
| Selenium | mg/kg | < 0.06 | < 0.06 | < 0.06 | 0.1 | 0.5 |
| Zinc | mg/kg | <1 | 0.11 | <1 | 4 | 50 |
| Chloride | mg/kg | 58 | 27 | 140 | 800 | 15000 |
| Fluoride | mg/kg | <2 | 4.1 | <2 | 10 | 150 |
| Sulphate | mg/kg | 14000 | 440 | 1600 | 1,000 | 20000 |
| Phenols | mg/kg | < 0.5 | < 0.5 | < 0.5 | 1 | |
| Dissolved Organic Carbon | mg/kg | 73 | 45 | 60 | 500 | 800 |
| Total Dissolved Solids | mg/kg | 24000 | 2100 | 4200 | 4000 | 60000 |
| Total Organic Carbon | % | 3 | 5.6 | 5.4 | 3.33% | |
| BTEX | mg/kg | < 0.5 | < 0.5 | < 0.5 | 6 | |
| PCBs | mg/kg | < 0.01 | < 0.01 | < 0.01 | Marie et al 1 | |
| Mineral Oil | mg/kg | 1800 | 150 | 5000 | 500 | |
| PAH (16) | mg/kg | 272 | 228.5 | 566 | | |
| PAH (17). | mg/kg | 280 | 230 | 570 | Murphy's 100mg/kg | |

*If DOC is less than 500 then a higher limit can be accepted
** Limit is for Mineral Oil

Table 4.4 Natural Ground WAC Dublin Centre 2008

| | Sample I.D. | BH-7 | BH-7 | BH-9 | BH-12 | THE Transfer Sent Towns | EU Limits for |
|--------------------------|-------------------|---------|---------|---------|-----------|---------------------------------|---------------------------|
| Parameter | Depth (m) Unit | 4-5 m | 13-14 m | 4-5 m | 4-5 m | EU Limits for Inert Landfill | Non-Hazardous Landfill |
| Arsenic | mg/kg | <0.50 | <0.5 | <0.50 | <0.50 | 0.5 | 2 |
| Barium | mg/kg | 0.084 | 0.14 | 0.076 | 0.068 | 20 | 100 |
| Cadmium | mg/kg | <0.001 | <0.001 | < 0.001 | < 0.001 | 0.04 | 1 |
| Chromium | mg/kg | < 0.10 | <0.1 | < 0.10 | < 0.10 | 0.5 | 10 |
| Copper | mg/kg | < 0.10 | < 0.1 | < 0.10 | < 0.10 | 2 | 50 |
| Mercury | mg/kg | 0.012 | 0.0038 | 0.0078 | < 0.003 | 0.01 | 0.2 |
| Molybdenum | mg/kg | < 0.03 | 0.085 | 0.056 | 0.2 | 0.5 | 10 |
| Nickel | mg/kg | < 0.10 | < 0.1 | < 0.10 | < 0.10 | 0.4 | 10 |
| Lead | mg/kg | < 0.10 | < 0.1 | < 0.10 | < 0.10 | 0.5 | 10 |
| Antimony | mg/kg | < 0.30 | < 0.3 | < 0.30 | < 0.30 | 0.06 | 0.7 |
| Selenium | mg/kg | < 0.060 | < 0.06 | < 0.060 | < 0.060 | 0.1 | 0.5 |
| Zinc | mg/kg | < 0.10 | < 0.1 | < 0.10 | < 0.10 | 4 | 50 |
| Chloride | mg/kg | <25 | 71 | <25 | <25 | 800 | 15000 |
| Fluoride | mg/kg | 3 | 4.2 | 2.7 | 2.9 | 10 | 150 |
| Sulphate | mg/kg | <110 | <110 | <110 | <110 | 1,000 | 20000 |
| Phenols | mg/kg | < 0.50 | < 0.5 | < 0.50 | < 0.50 | 1 | - |
| Dissolved Organic Carbon | mg/kg | 13 | 39 | 14 | 19 | 500 | 800 |
| Total Dissolved Solids | mg/kg | <2000 | <2000 | <2000 | <2000 | 4000 | 60000 |
| Total Organic Carbon | % | 3.1 | 0.52 | 2.8 | 2.4 | 3%* | (4) |
| BTEX | mg/kg | < 0.5 | < 0.5 | < 0.5 | < 0.5 | 6 | |
| PCBs | mg/kg | < 0.01 | < 0.01 | < 0.01 | < 0.01 | 1 | |
| ТРН | mg/kg | <50 | <50 | <50 | 50 57 500 | | |
| PAH (16) | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | | |
| PAH (17). | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | Murphy's 100mg/kg | / |

^{*}If DOC is less than 500 then a higher limit can be accepted
** Limit is for Mineral Oil

Table 4.4 continued Natural Ground WAC Dublin Centre 2008

| | Sample I.D. | BH-12 | BH-14 | BH-14 | BH-15 | EU Limits for Inert | EU Limits for |
|--------------------------|-------------------|---------|--|---------|-----------|---------------------|---------------------------|
| Parameter | Depth (m) Unit | 8-10m | 3-4m | 8-10m | 12.0-13.0 | Landfill | Non-Hazardous Landfill |
| Arsenic | mg/kg | <0.50 | < 0.50 | < 0.50 | < 0.5 | 0.5 | 2 |
| Barium | mg/kg | 0.17 | 0.046 | 0.27 | 0.17 | 20 | 100 |
| Cadmium | mg/kg | < 0.001 | < 0.001 | < 0.001 | < 0.001 | 0.04 | 1 |
| Chromium | mg/kg | <0.10 | < 0.10 | < 0.10 | <0.1 | 0.5 | 10 |
| Copper | mg/kg | <0.10 | < 0.10 | < 0.10 | 0.15 | 2 | 50 |
| Mercury | mg/kg | 0.0047 | 0.0039 | 0.0036 | < 0.003 | 0.01 | 0.2 |
| Molybdenum | mg/kg | 0.1 | 0.18 | 0.15 | 0.046 | 0.5 | 10 |
| Nickel | mg/kg | <0.10 | < 0.10 | < 0.10 | 0.14 | 0.4 | 10 |
| Lead | mg/kg | < 0.10 | < 0.10 | <0.10 | 0.41 | 0.5 | 10 |
| Antimony | mg/kg | < 0.30 | < 0.30 | < 0.30 | <0.3 | 0.06 | 0.7 |
| Selenium | mg/kg | 0.079 | < 0.060 | < 0.060 | <0.06 | 0.1 | 0.5 |
| Zinc | mg/kg | 0.19 | < 0.10 | < 0.10 | <0.1 | 4 | 50 |
| Chloride | mg/kg | 41 | <25 | 35 | 100 | 800 | 15000 |
| Fluoride | mg/kg | 2.7 | 2.3 | 2.4 | 4.7 | 10 | 150 |
| Sulphate | mg/kg | 250 | <i 10<="" td=""><td>420</td><td>130</td><td>1,000</td><td>20000</td></i> | 420 | 130 | 1,000 | 20000 |
| Phenols | mg/kg | < 0.50 | < 0.50 | < 0.50 | <0.5 | 1 | |
| Dissolved Organic Carbon | mg/kg | 19 | 27 | 23 | 37 | 500 | 800 |
| Total Dissolved Solids | mg/kg | <2000 | <2000 | <2000 | <2000 | 4000 | 60000 |
| Total Organic Carbon | % | 1.4 | 3.5 | 1.4 | 0.34 | 3%* | |
| BTEX | mg/kg | <0.5 | < 0.5 | <0.5 | < 0.5 | 6 | |
| PCBs | mg/kg | < 0.01 | <0.01 | < 0.01 | < 0.01 | 1 | |
| ТРН | mg/kg | <50 | <50 | <50 | <50 | 500** | - |
| PAH (16) | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | | |
| PAH (17). | mg/kg | <1.0 | <1.0 | <1.0 | <1.0 | Murphy's 100mg/kg | |

^{*}If DOC is less than 500 then a higher limit can be accepted
** Limit is for Mineral Oil

4.4 Groundwater

Samples were collected from four groundwater monitoring wells, OW-1 Subsoils (OW-1 S) and OW-1 Bedrock (OW-1 B) and RC-16 Subsoils (RC-16 S) and RC-16 Bedrock (RC-16 B). The samples were collected in accordance with OCM's Groundwater Sampling Protocol, a copy of which is included in Appendix 5.

All the samples were sent to the STL laboratory in Santry for analysis. The range of parameters tested was based on the nature of the historical site activities and included dissolved metals (arsenic, antimony, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, tin and zinc.), sodium, chloride, potassium, magnesium, sulphate, sulphide, total hardness, bicarbonate, TPH, BTEX and PAH.

The laboratory test report is included in Appendix 5 and the results are shown in Table 4.5. The results are compared for discussion purposes with the EPA Interim Guideline Values (IGVs). The IGVs are not statutory guidelines but have been prepared by the EPA to assist in the assessment of impacts on groundwater quality.

TPH was only detected in one well-RC-16- at a level of 8 mg/l, which is above the IGV of 0.01 mg/l. Iron, manganese and potassium exceeded their respective IGVs in both the subsoil and bedrock samples from RC -16. Barium, sodium and copper exceeded the IGV in the bedrock sample from RC-16 and PAH exceeded the IGV in the bedrock sample from RC-16.

PAHs exceeded the IGV in the subsoil and bedrock samples from RC-16 Subsoil and the bedrock sample in OW-1.

Chloride exceeded the IGV of 30 mg/l in both subsoil and bedrock samples from RC-16 and OW-1. The sulphate level in the bedrock sample marginally exceeded the IGV and hardness also exceeded the IGV in the subsoil sample from OW-1 and both subsoil and bedrock samples from RC-16.

Table 4.5 Groundwater Results Dublin Centre December 2008

| Samula I D | Units | Subsoi | il Wells | Bedroc | k Wells | IGV |
|-----------------------|-------|---------------|--------------|---------------|--------------|-------|
| Sample I.D. | Units | RC-16 Subsoil | OW-1 Subsoil | RC-16 Bedrock | OW-1 Bedrock | 164 |
| Antimony | mg/l | 0.00048 | 0.00017 | 0.0023 | 0.00015 | - |
| Arsenic | mg/l | 0.0069 | < 0.0001 | 0.0059 | < 0.0001 | 0.01 |
| Barium | mg/l | 0.056 | 0.015 | 0.12 | 0.018 | 0.1 |
| Cadmium | mg/l | < 0.0001 | 0.00014 | 0.00024 | < 0.0001 | 0.005 |
| Chromium | mg/l | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 0.03 |
| Copper | mg/l | 0.025 | < 0.007 | 0.096 | < 0.007 | 0.03 |
| Iron | mg/l | 0.41 | 0.045 | 0.55 | 0.041 | 0.2 |
| Lead | mg/l | 0.0033 | < 0.0005 | 0.00081 | < 0.0005 | 0.01 |
| Manganese | mg/l | 0.17 | 0.022 | 0.07 | <0.01 | 0.05 |
| Mercury | mg/l | < 0.0003 | < 0.00030 | 0.00074 | < 0.00030 | 0.001 |
| Nickel | mg/l | 0.006 | < 0.0005 | 0.0039 | 0.0005 | 0.02 |
| Tin | mg/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | - |
| Zinc | mg/l | 0.053 | < 0.005 | 0.016 | 0.005 | 0.1 |
| Magnesium | mg/l | 6.6 | 8.8 | 28 | 8.4 | 50 |
| Potassium | mg/l | 60 | 11 | 7.6 | 10 | 5 |
| Sodium | mg/l | 100 | 35 | 680 | 35 | 150 |
| Hardness (as CaCO3) | mg/l | 100 | 360 | 210 | 360 | 200 |
| Bicarbonate as CaCO3 | mg/l | 710 | 200 | 350 | 200 | |
| Chloride as Cl | mg/l | 150 | 39 | 860 | 41 | 30 |
| Sulphate as SO4 | mg/l | <11 | 150 | 230 | 160 | 200 |
| Sulphide as S | mg/l | 0.14 | < 0.010 | 0.011 | <0.010 | |
| ТРН | mg/I | 8 | <0.1 | <0.1 | <0.1 | 0.01 |
| PAH Total (Sum of 16) | μg/l | 16 | <0.10 | 0.25 | 1.7 | 0.1 |
| Benzene | μg/l | <10 | <10 | <10 | <10 | i |
| Toluene | μg/l | <10 | <10 | <10 | <10 | 10 |
| Ethylbenzene | μg/l | <10 | <10 | <10 | <10 | 10 |
| p & m xylene | μg/l | <20 | <20 | <20 | <20 | 10 |
| o-Xylene | μg/l | <10 | <10 | <10 | <10 | 10 |

5. DISCUSSION

5.1 Discussion

The purpose of environmental site investigation was to establish if there was contamination in the subsoils or groundwater associated with the historical use of the site. It was also undertaken to establish the nature of the fill material and underlying subsoils in terms of off-site management options for such materials that will have to be removed during site development.

The majority of the Dublin Centre area has been in use as shops, offices, stores and houses since the late 1700's. The 2006 assessment concluded that, given the nature of these historic landuses, the potential for subsurface soil or groundwater contamination is considered to be low. However, the assessment identified areas where there was potential for subsurface contamination. These included the Royal Dublin Hotel; car parking area for Dr. Quirke's Emporium; 5-11 Moore Lane, and 4-8 Henry Place.

The environmental investigation, in so far as the ground conditions allowed, targeted those risk areas identified in the 2006 assessment. Boreholes RC-8 and W-2 were installed in 48A-50 O' Connell Street, which had been designated at moderate risk. It is presently used as an unpaved car park and storage area for Dr. Quirke's Emporium.

5.2 Soils

In RC-8 and W-2, the levels of sulphate, total dissolved solids, TPH and PAHs exceeded the inert waste WAC. However all of the levels were less than the non-hazardous WAC.

In BH-12, which was located on the southeast perimeter of the site TPH and mercury were detected above the inert waste WAC in the upper fill sample; however the levels of these parameters in the underlying fill and natural ground were less than the inert WAC.

There was no evidence of significant contamination in any of the other samples and the tested parameters, where detected, are at levels generally below the inert WAC.

5.3 Groundwater

TPH and PAHs above the IGV limits were detected in the well installed in the subsoil in RC-16. A strong hydrocarbon odour was noted during sampling. No TPH or PAH was detected in the bedrock well. RC-16 is located immediately to the south and not within the portion of the site where deep excavation will occur. It is possible therefore that the hydrocarbons detected in this well originate from an off-site location and not from within the development site.

Low levels of PAH were detected in the subsoil and bedrock wells at OW-1 in the centre of the site. While the levels detected are above the IGV limits, they are not indicative of significant pollution.

The elevated iron and manganese levels detected in the subsoil and bedrock wells and are most likely naturally occurring. The copper level detected in OW-1, while slightly above the IGV is less than the drinking water standard for this parameter (2mg/L) and this detection is not therefore considered to be significant.

Elevated potassium and chloride levels were detected in both wells with higher chloride leves detected in RC-16, which is closest to the River Liffey. The levels detected are not indicative of significant contamination from historical site activities and it is possible that there is link via the gravels beneath the site and the brackish waters in the River Liffey.

OCM understand that pumping tests have been carried out to estimate the dewatering rate that will be necessary during the deep excavation and construction of the basement. While the volumes of groundwater in the fill, subsoil and bedrock, higher volumes may be expected from the gravels where present in significant thickness.

The groundwater quality monitoring data indicates that while low levels of PAH are present, the water should be suitable for discharge to sewer. Dublin City Council are likely to require on-site settlement to treat suspended solids and possibly pH control during any concrete forming or piling works.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The subsurface comprises made ground ranging in thickness from 2 - 5.2 m, which contains mainly grey brown gravelly clay fill with red brick. This is underlain by natural ground of between 11.1 m and 23.3 m in thickness, that comprises gravels underlain by clay. The minimum depth to bedrock is 12.6 m while the maximum is 27.3 m.

The bedrock ranges from interbedded argillaceous limestone, siliceous limestone and black fossiliferous shale which are part of the Calp Limestone formation. The bedrock is considered to be a Locally Important Aquifer (Ll), which is moderately productive only in local zones. Aquifer vulnerability is considered to be moderate to low.

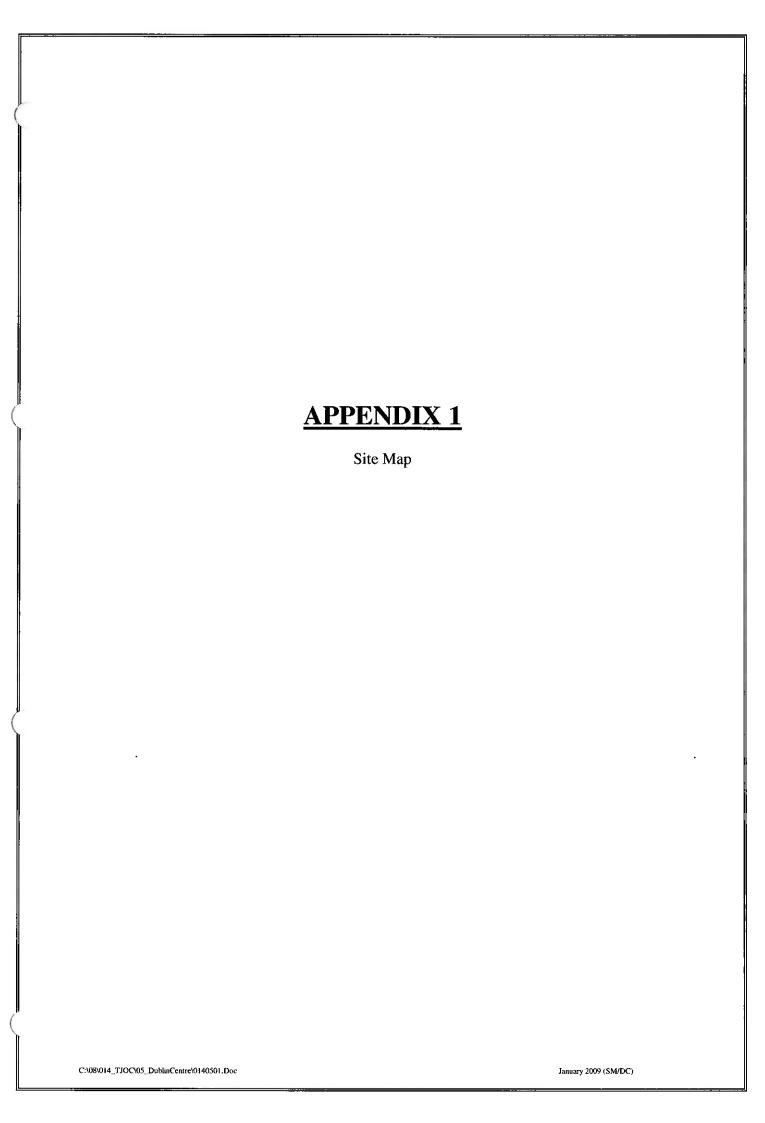
The investigation has established that the fill material and the underlying subsoils can generally be categorised as inert and suitable either for disposal at inert landfill or for use in land reclamation projects. There are localised zones in the fill such as at BH-12, RC-8 and W-2, where the contaminant levels exceed the inert category limits. However in these cases the materials fall into the non-hazardous waste category.

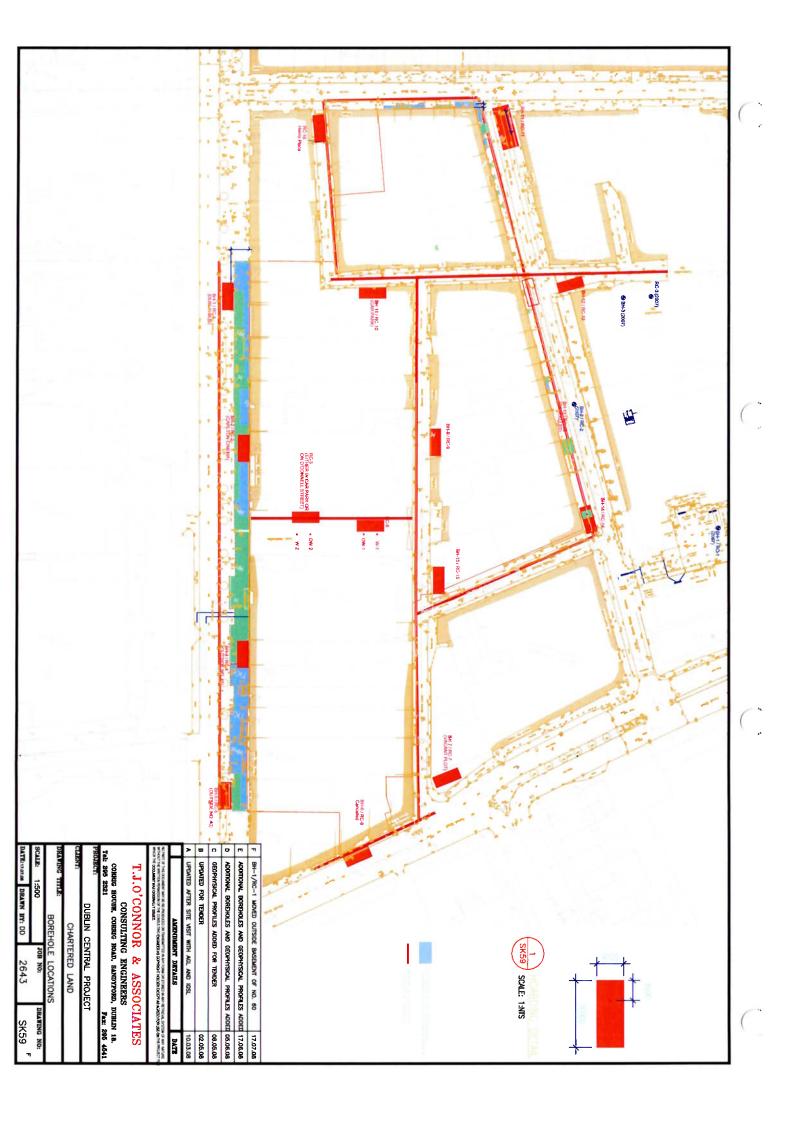
Elevated PAH levels were detected in the groundwater wells immediately to the south but not within the portion of the site where deep excavation will occur. It is possible therefore that these from an off-site location and not from within the development site. Low levels of PAH were detected in the subsoil and bedrock wells in the centre of the site. While the levels are above the IGV limits they are not indicative of significant pollution and the water should be suitable for discharge to sewer during the dewatering programme.

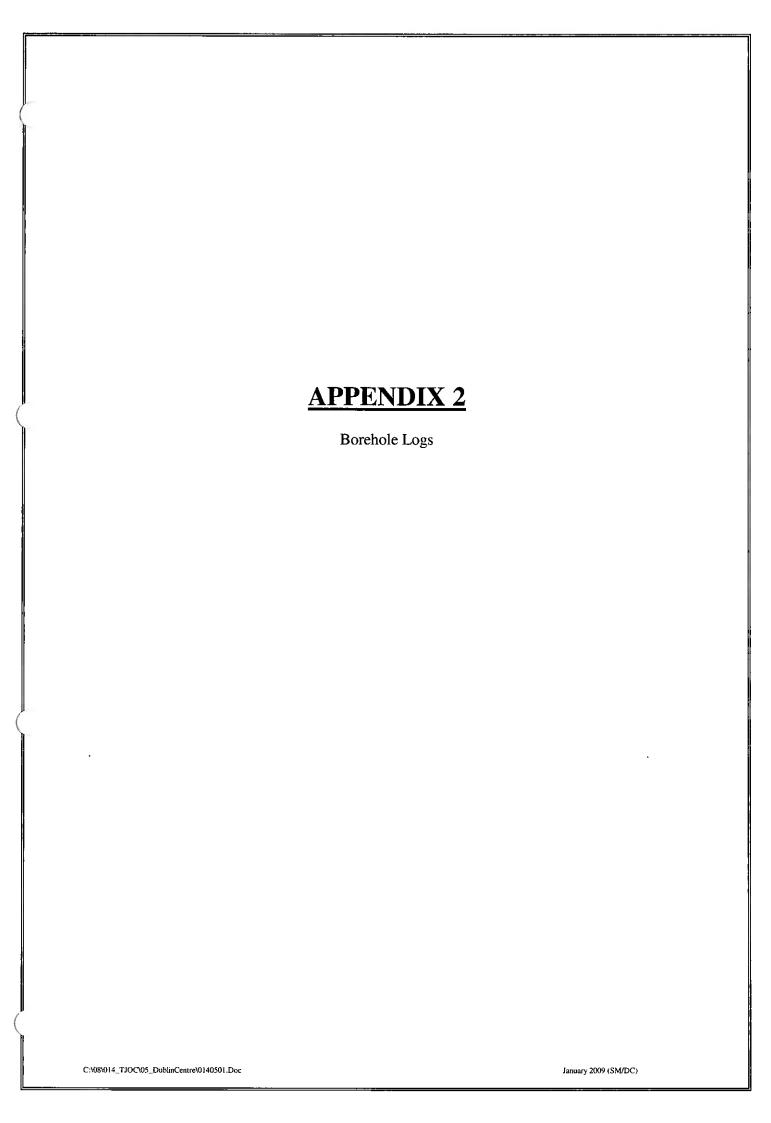
6.2 Recommendations

OCM recommend that following site clearance and as part of the bulk excavation samples of the fill and subsoil excavated in the vicinity of BH-12, W-2 and RC-8 be tested to confirm the waste characterisation i.e. inert or non-hazardous.

OCM recommend that all material excavated and removed from the site be disposed of in accordance with Dublin City Council Waste Management Regulations to suitably permitted or licensed waste management facilities.









GEOTECHNICAL BORING RECORD

REPORT NUMBER

13696

| | NTRACT -ORDINA | | | ai Devel | opment - Dra | RIG TYI | PE | | | Da | indo 15 | | BORE SHEE | Τ | RTED | BH7 Sheet 1 of 2 05/08/2008 | |
|-----------|---------------------|--|--------------------|---|------------------------------|-------------------|--|-----------|------------------------------|-----|------------------------------|--------------------|----------------|---------------------|--|--|-----------|
| GRO | OUND LE | VEL (m | AOD) | | | BOREH | OLE DIAN | IETER | (mm) | 200 | | | | | | ED 12/08/2008 | |
| CLI | ENT SINEER | Dubli | | | opments Ltd | | OLE DEPT | | | | .00 .00 | - 1 | BORE PROC | | , ED BY | J. O'Hara S. Letch | |
| Depth (m) | | | De | escription | 1 | | Tegend | Flevation | Depth (m) | | Ref. Number | Sample Type | ples Depth | Œ. | Recovery | Field Test Results | Standpipe |
| 0 | MADE G | ROUNI | O consis | sting of c | oncrete. | | ****** | | <u> </u> | + | | - | | \dashv | <u>~</u> | | ka |
| 2 | MADE G | ROUNI | D consis | sting of b | rown grey sa obbles and r | andy ed brick. | | | 0.30 | | AF4959 AF4960 | В | 2.70- | | | N = 7 (1, 1, 1, 2, 2, 2) N = 57 (5, 7, 15, 13, 11, 18) N = 63 (6, 5, 9, 13, 17, 24) | |
| 4 | | | | | | | | | 4.20 | | AF4961 | В | 3.60- | 3.60 | | N = 100/225 mm (9, 20, 33, 38, 29) | |
| 5 | many col | Dense grey slightly clayey/silty sandy GRAVEL wire many cobbles. Gravel is fine to coarse and subrounded to subangular of limestone. | | | | | | EL with | | | | В | 4.50- | 4.50 | | N = 26 (7, 7, 6, 7, 6, 7) | |
| | | | | | | | 2000 | | | | AF4963 | В | 5.50- | 5.50 | | (1, 1, 6, 1, 6, 1) | |
| 6 | | | | | | | 00000000000000000000000000000000000000 | | | | AF4964 | 8 | 6.30- | 5.30 | | N = 31 (2, 4, 6, 8, 8, 9) | |
| 7 | | | | | | | \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ | | | | A F4 965 | В | 7.30- | 7.30 | | N = 13 (5, 3, 3, 3, 3, 4) | |
| 9 | | | | | | | \$ 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | | | | AF4966 | В | 8.30-1 | 3.30 | į | N = 21 (1, 1, 3, 5, 5, 8) | |
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| 16 | 6 11 | 3 | 2 | Boulder | | | Date | | Hole Depth | | Casing Depth | De W | pth to ater | | mment | s | |
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GEOTECHNICAL BORING RECORD

REPORT NUMBER

13696

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| co | O-ORDINA | ΓES | | | | RIG TYP | E | | | | ando 15 | 50 | DATE ST | ARTE | D 05/08/2008 | |
| GR | OUND LE | VEL (n | n AOD) | | | BOREH | OLE DIAN | METE | R (r | nm) 2 | 00 | | DATE CO | MPL | ETED 12/08/2008 | |
| | IENT | | | l Developme | ents Ltd | | OLE DEP | - | n) | | 6.00 | | BORED E | | J. O' Ha ra | |
| EN | GINEER | AGL | Consulting | g Ltd | | CASING | DEPTH (| m) | | 1 | 6.00 | | PROCES | SEDI | BY S. Letch | - |
| Œ | | | | | | | | | ۶ | Ξ | | _ | ipies | | Field Tees | <u>e</u> |
| Depth (m) | | | Des | cription | | | Puegend | | Elevation | Depth (m) | Ref. Number | Sample Type | Depth (m) | Recovery | Field Test Results | Standpipe Details |
| 10 | many col | obles a clay. Gr | nd lenses | y/silty sandy of brown si e to coarse | lightly sar | L with ndy ounded / | | | | 10.00 | AF4967 | В | 10.20-10.20 | | N = 25 (8, 7, 7, 6, 6, 6) | |
| 11 | Very den | se grey Gravel | / slightly s is fine to | sandy GRA\ coarse and | /EL with s subround | some led to | 00.00 | | | | AF4968 | В | 11.00-11.00 | | N = 100 (12, 15, 16, 21, 25, 3 | 8) |
| 12 | | | | | | | 80.80 80 80.80 80.80 80 80 80.80 80 80 80 80 80 80 80 80 80 80 80 80 8 | | | | AF4969 | В | 12.00-12.00 | ! | N = 100/225 mm (11, 20, 25, 33, 41) | |
| 13 | | | | | | | | | | | AF4970 | В | 13.00-13.00 | | N = 100/90 mm (25, 44, 56) | |
| 14 | | | | | | | 80.00 80.00 80.00 80.00 | | | | AF4971 | В | 14.00-14.00 | | N = 100/185 mm (8, 11, 33, 48, 19) | |
| 15 | i | | | | | | 000000000000000000000000000000000000000 | | | | AF4972 | В | 15.00-15.00 | | N = 100/150 mm (17, 27, 39, 61) | |
| - 16 | \cobbles. Obstuction | n - pos | htly sandy ssible bou at 16.00 | r gravelly Cl Ider m | LAY with | some | g* | | | 15.80 16.00 | AF4973 AF4974 | ВВ | 15.90-15.90 16.00-16.00 | | N = 100/90 mm (25, 40, 60) | |
| - 17 | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | |
| LU A | ADD STDA | TA PO | DINGC | IISELLING | | | IAJA T | ED 61 | TP" | KE DET | All C | <u> </u> | | | | <u> </u> |
| | m (m) To | - | Time C | comments | | | Wate | r (| Cas | ing S | ealed | Rise | | | Comments | |
| ├─ | 4 4. | 2 | 05 B | oulder | | | Strike | - | Dep | oth | At | То | (mi | n) | | |
| 1 | 5.6 9 9 12 2.5 13 | .6 | 8 H | ard Strata Borin ard Strata Borin ard Strata Borin | ğ | | | | | | | | | \perp | | |
| 1 | 3.5 1 16 1 | 3 | 7 H | ard Strata Borin oulder | | | | | | ER DET | Casing | Dei | oth to | | | |
| | | | | | | | Dat | _ | D | epth | Depth | W | ater C | omme | | |
| INS | | | | | | | 07-08 08-08 08-08 | -08 | 1 | 2.50 2.50 3.50 | 12.50 12.50 13.50 | 6 | 5.40 St | id of shi art of sh id of shi | nift | |
| 12- | STALLATION DETAILS | | | | | | 11-08 11-08 12-08 12-08 | -08 -08 -08 | 1 | 3.50 6.00 6.00 6.00 | 13.50 16.00 16.00 16.00 | 4 | 5.20 St 1.80 Er 5.20 St | art of shi art of shi art of shi art of shi | nift ift nift | |
| KE | REMARKS Hand dug inspection pit excavated to 1.20m. Blowing gravels from 5.6m bgl to base of hole. Falling and rising head test completed. | | | | | | | | | | | | | | | |



GEOTECHNICAL BORING RECORD

REPORT NUMBER

13696

| | CONTRACT Dublin Central Development - Draft CO-ORDINATES RIG TYPE | | | | | | | | | | | BOREHOLE NO. SHEET | | BH9 Sheet 1 of 2 | |
|---------------------------------|--|-------------------|-------------|--------------------|--|--|--|------------------------------|--------------------|---------------------------|---|--------------------|--------------------------|----------------------------------|--|
| | | NATES LEVEL (1 | n AOD) | | | | YPE Dando 150 HOLE DIAMETER (mm) 200 | | | | | DATE ST | | 15/07/2008 FED 23/07/2008 | |
| Dubini Contrar Developments Eta | | | | | | BOREHOLE DEPTH (m) CASING DEPTH (m) | | | 17.50 17.50 | | BORED BY PROCESSED BY | | J. McDonnell S. Letch | | |
| Depth (m) | | | De | escription | | | pue | Elevation | Depth (m) | Ref. Number | 1 | nples - | Recovery | Field Test Results | Standpipe |
| Dep | | | | | | Legend | Elev | Dep | Ref. | Sample Type | Depth (m) | Reco | Results | Stan | |
| 1 | MADE GROUND consisting of reinforced concrete. MADE GROUND consisting of brown grey sandy slightly gravelly clay with some cobbles and red brick. | | | | | | | | 0.20 | AF1908 | В | 1.00-1.00 | | N = 7 (2, 2, 2, 1, 1, 3) | |
| 2 | GRA' | VEL with r | nany col | slightly claye | is fine to | ndy coarse | \$ - 2 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 | | 2.00 | AF1909 | В | 2.10-2.10 | | N = 36 (4, 6, 7, 2, 10, 17) | |
| | and s | subrounde | d to suba | angular of lim | nestone. | | 2000 | | | AF1910 | В | 2.50-2.50 | | | |
| 3 | | | | | | | 200 | | | AF1911 | В | 3.00-3.00 | | N = 39 (7, 9, 8, 10, 10, 11) | |
| 4 | | | | | | | 80000 | | | AF1912 | В | 4.00-4.00 | | N = 28 (2, 3, 6, 7, 8, 7) | |
| 5 | | | | | | | 00000000000000000000000000000000000000 | | | AF1913 | 8 | 5.00-5.00 | | N = 34 (3, 4, 7, 7, 9, 11) | |
| 3 | | | | | | | 2000 | | | AF1914 | В | 6.00-6.00 | | N = 27 (3, 3, 4, 8, 8, 7) | |
| 7 | | | | | | | | | | AF1915 | В | 7.00-7.00 | | N = 77 (7, 18, 20, 25, 20, 12 | |
| 8 | | | | | | | \$ 50 00 00 00 00 00 00 00 00 00 00 00 00 | | · | AF1916 | В | 8.00-8.00 | | N = 69 (6, 12, 16, 20, 20, 13 | ************************************** |
| 9 | | | | | | | | | | AF1917 | В | 9.00-9.00 | | N = 18 (6, 6, 5, 5, 5, 3) | |
| на | RD S1 | TRATA BO | - | HISELLING | | | WATE | | KE DE | | | l | | | _KA |
| | n (m) | (11) | | | | Water Strike 5.50 | De | sing pth 50 | Sealed At No | Rise <u>To</u> 3.10 | (m | me C iin) C | comments Rapid | | |
| | | | | E 110 | | | GROUP | NDWAT | ER DF | TAILS | | | | | |
| | | | | | | | Date | | Hole Depth | Casing Depth | De W | oth to ater | Commer | nts | |
| INSTALLATION DETAILS | | | | | 15-07-0 16-07-0 16-07-0 17-07-0 | -08 2.00 -08 2.00 -08 7.00 | | 2.00 2.00 7.00 7.00 | | - S 1.50 E | nd of shift tart of shift nd of shift tart of shif | t | | | |
| | | | nspection p | nit excavated to 1 | .20m. Falling | and rising | | | | | | | | | (|



GEOTECHNICAL BORING RECORD

REPORT NUMBER

| | NTRACT | | entral I | Developme | nt - Draft | | | | | | | | BOREHO SHEET |)LE N | Ю. | | 3H9 heet | 2 of 2 | |
|--------------|----------------------------------|---------------------------|----------------------|---|---|-----------------|--|--------|----------------|-------------|-------------------|----------------|---|------------|-------|-----------------|-------------------------------|--------------------------|-----------|
| | ORDINAT | ES /EL (m AC |)D) | | | 3 TYPE REHOL | E DIAM | ETER | t (mm) | Dand 200 | o 15 | | DATE ST | | | | 5/07/ 3/07/ | | |
| LIE | ENT | Dublin C | entral l | Developme | nts Ltd BC | REHOL | E DEP1 | TH (m) |) | 17.50 | | Ī | BORED | BY | | J | . McE | onne | ll |
| NG | SINEER | AGL Con | sulting | Ltd | CA | SING D | EPTH (| m) | | 17.50 | | | PROCES | SED | BY | S | . Let | ch | <u>.,</u> |
| _ | | | | | | | | | _ | | | Sam | ples | | _ | | | | a |
| Capul (III) | | | Desc | ription | | | Legend | | Depth (m) | Fee | Number | Sample Type | Depth (m) | Recovery | | | ld Te esults | | Standpipe |
| 11 | GRAVEL and subro (continue | with many ounded to s | cobble subang | es. Gravel i gular of lime | r/silty sandy s fine to coa estone. | 6 | 00000000000000000000000000000000000000 | | | AF1 | 919 920 921 | B B | 11.00-11.00 11.00-11.00 12.00-12.00 | D. | | 11, 13 (7, 5 | N = 43 , 8, 8, 1 N = 78 |), 10, 10 } 3, 14) | |
| 4 | | brown slig al cobbles. | ghtly sa | andy grave | ly CLAY with | 5 | 3- <u>%</u> - | | 13.5 | AF1 | 922 | В | 14.00-14.0 | 0 | | | N = 68 | , | |
| | some cob subround | bles. Grav ed to suba | el is m ngular | edium to co of limestor | e | /[2 |) - A - | | 14.5 | J AF1 | 923 iled | 8 U | 14.40-14.4 14.50-14.5 | | ec | (-,, | | , | |
| 5 | occasiona | Drown slig al cobbles. | ghtly sa | andy grave | ly CLAY with | | | | | AF1 | 924 | 8 | 15.00-15.0 | o l | | | 45/150 35, 20 | | |
| | some cob subround | bles. Grav ed to suba | el is m ngular | ghtly sandy edium to co of limestor gravelly CL/ | e. | ith | | | 15.9 | A | 925 | В | 16.00-16.0 | 0 | | | | | |
| 7 | | al cobbles. | | u = | | <u>-</u> | - | | 17/ | 10 | 828 | В | 16.80-16.8 | | | | N = 10 | | |
| | | n - possibl | | | | <u> </u> | | | 17.0 | | 829 | В | 17,10-17.1 | 0 | | (8, 12, | 20, 30 | , 30, 20) | |
| 8 | End of Bo | rehole at 1 | 17.50 n | n | | | | | 17. | 00 | | | • | | | | | | |
| 1 A 1 | RD STRA | TA BORIN | _ | SELLING | | | | | | ETAIL | | D'- | | | | | | | į |
| | n (m) To (| (!!) | 100 | mments | | | Wate Strike |] [| asing Depth | Seale At | ;Q | Rise To | | me iin) | Cor | mme | nts | | |
| 16 17 | | | | ulder ulder | | | | | | | | | | | | | | | |
| | | | | | GROU | NDW/ | | ETAIL | <u>s</u> | | | | _ | | | | | | |
| | | | | | | | Date | e | Hole Depth | | sing pth | De \/ | pth to c | Comm | ents | 3 | | | |
| | | | | | | | 17-07- | | 13.00 | 13 | .00. | | 5.00 E | nd of sh | | | | - | |
| | TALLATIO | N DETAIL | S Z Ton | P7 Pagal | Typo | | 18-07- 18-07- | 08 | 13.00 16.50 | 16 | .00 .50 | | 5.80 E | itart of s | hift | | | | |
| | | Depth R 3.50 1 | <u>2 10p</u> 2.00 | 13.50 | Type 50mm SF | <u> </u> | 21-07- | 08 | 16.50 | 16 | .50 | ' | 4.65 S | start of s | snift | | | | |



GDT 1/10/08

IGSL

GPJ

BH LOG DCD

GEOTECHNICAL BORING RECORD

REPORT NUMBER

13696

BOREHOLE NO. **BH10** CONTRACT **Dublin Central Development - Draft** SHEET Sheet 1 of 2 **CO-ORDINATES RIG TYPE** Dando 150 **DATE STARTED** 30/07/2008 **GROUND LEVEL (m AOD) BOREHOLE DIAMETER (mm)** 200 DATE COMPLETED 13/08/2008 BOREHOLE DEPTH (m) 15 45 CLIENT **BORED BY Dublin Central Developments Ltd** J. McDonnell 15.45 **ENGINEER** CASING DEPTH (m) **PROCESSED BY** AGL Consulting Ltd S. Letch Samples Ξ Depth (m) Standpipe Elevation Sample Type Ref. Number Field Test -egend Description Depth Depth (m) Results MADE GROUND consisting of concrete.

MADE GROUND consisting of brown grey sandy - 0 0.10 slightly gravelly clay with some cobbles and red brick. AF1830 В 1.00-1 00 AF1831 -2 8 2.00-2.00 (1, 1, 2, 1, 1, 2) AF1832 3.00-3.00 N = 51 (8, 18, 16, 11, 17, 7) - 3 Very dense grey slightly clayey/silty sandy GRAVEL 0.48 3.00 with many cobbles. Gravel is fine to coarse and subrounded to subangular of limestone. N = 30 (3, 5, 7, 7, 8, 8) AF 1833 В 4.00-4.00 N = 50 (8, 8, 14, 14, 12, 10) AF1834 в 5.00-5.00 F 5 5.50 Dense grey slightly clayey/silty sandy GRAVEL with many cobbles. GRAVEL is fine to coarse and subrounded to subangular of limestone. N = 28 (4, 6, 6, 7, 7, 8) 200 AF1835 В 6.00-6.00 00-00 100 Very stiff black slightly sandy gravelly CLAY with 6.80 AF1836 В 7.00-7.00 occasional cobbles (3, 15, 18, 12, 11, 15) 0 7.50 Very dense grey slightly clayey/silty sandy GRAVEL with many cobbles. Gravel is fine to coarse and 80 subrounded to subangular of limestone. N = 100/225 mm (15, 24, 25, 30, 45) 200 AF1837 В 8.00-8.00 N = 52AF1838 В 9 00-9.00 ٠9 (7, 9, 14, 15, 13, 10) 080 HARD STRATA BORING/CHISELLING **WATER STRIKE DETAILS** Water Casing Sealed Rise Time From (m) To (m) Comments Comments Strike То (h) Depth <u>At</u> (min) Hard Strata Boring Hard Strata Boring Moderate No 8.00 8.00 6.50 20 14.5 15.45 15.4 Boulder **GROUNDWATER DETAILS** Depth to Water Hole Casing Date Comments Depth Depth 6.00 6.00 8.00 8.00 30-07-08 6.00 End of shift 08-08-08 08-08-08 11-08-08 4.80 6.10 4.55 Start of shift End of shift INSTALLATION DETAILS 8.00 Tip Depth RZ Top RZ Base Туре Start of shift REMARKS Hand dug inspection pit excavated to 1.20m. Water added from 3.0m to aid drilling. Blowing gravels from 9.5m to 10.5m and 11.5m to 12.0m bgl. Falling and rising head test completed. Standing 5.5 days - stopped by Client due to Landowner request.



GEOTECHNICAL BORING RECORD

REPORT NUMBER

13696

BOREHOLE NO. **BH10** CONTRACT **Dublin Central Development - Draft** SHEET Sheet 2 of 2 CO-ORDINATES **RIG TYPE** Dando 150 **DATE STARTED** 30/07/2008 **BOREHOLE DIAMETER (mm)** 200 DATE COMPLETED 13/08/2008 **GROUND LEVEL (m AOD) BOREHOLE DEPTH (m)** 15.45 CLIENT **Dublin Central Developments Ltd BORED BY** J. McDonnell **ENGINEER** AGL Consulting Ltd **CASING DEPTH (m)** 15.45 PROCESSED BY S. Letch Samples Standpipe Details Ξ Depth (m) Elevation Sample Type Recovery Field Test Legend Description Depth Depth (m) Results - 10 0.00-10.00 Very dense grey slightly clayey/silty sandy GRAVEL (9, 13, 16, 24, 19, 17 with many cobbles. Gravel is fine to coarse and subrounded to subangular of limestone. (continued) ති N = 100/160 mm (13, 39, 50, 40, 10) AF1840 В 11.00-11.00 N = 100/170 mm (12, 30, 40, 45, 15) AF1841 12.00-12.00 12 В N = 100/125 mm (12, 23, 62, 38) AF1842 13.00-13.00 13 13.80 Hard black slightly sandy gravelly CLAY with N = 100/230 mm (4, 10, 20, 35, 40, 5) AF1843 В 14.00-14.00 occasional cobbles. N = 100/75 mm AF1844 15.00-15.00 15 (12, 43, 100)15.40 15.45 AF1845 15.45-15.45 Obstuction - possible boulder End of Borehole at 15.45 m 16 F 17 18 19 HARD STRATA BORING/CHISELLING WATER STRIKE DETAILS Water Casing Sealed Rise Time From (m) To (m) Comments Comments Strike Depth (min) (h) Αt Hard Strata Boring Hard Strata Boring Boulder 1/10/08 11 15.4 14.5 15.45 **GROUNDWATER DETAILS** GDT Hole Casing Depth to Water Date Comments Depth Depth SS 11-08-08 12-08-08 12-08-08 13-08-08 11.00 11.00 14.50 14.50 11.00 11.00 14.50 14.50 End of shift 4.90 4.60 5.60 4.50 Start of shift End of shift Start of shift INSTALLATION DETAILS

Date | Tip Depth RZ Top | RZ Base Туре 5.60 End of shift REMARKS Hand dug inspection pit excavated to 1.20m. Water added from 3.0m to aid drilling. Blowing gravels from 9.5m to 10.5m and 11.5m to 12.0m bgl. Falling and rising head test completed. Standing 5.5 days - stopped by Client due to Landowner request.

REPORT NUMBER **GEOTECHNICAL BORING RECORD** 13696 Dublin Central Development - Draft BOREHOLE NO. **BH12** SHEET Sheet 1 of 2 **RIG TYPE** Dando 2000 **DATE STARTED** 12/10/2008 200 16/10/2008 **BOREHOLE DIAMETER (mm)** DATE COMPLETED BOREHOLE DEPTH (m) 13.60 Dublin Central Developments Ltd J. McDonnell **BORED BY** AGL Consulting Ltd CASING DEPTH (m) 13.60 PROCESSED BY S. Letch Samples oth (m) ndpipe ails /ation overy mber mple Field Test Description 듣 Results

| Depth (| | Legend | Elevatio | Depth (r | Ref. Number | Sample Type | Depth (m) | Recover | Field Test Results | Standpit Details |
|---------|--|---------------------------------|----------|----------|----------------|----------------|--------------|---------|--|---------------------|
| 0 | MADE GROUND consisting of brown slightly sandy gravelly clay with some red brick and concrete. | | | | AF4857 | В | 1.00-1.00 | | | |
| - 1 | | | | | AF400/ | | 1.00-1.00 | | N = 14 (2, 2, 3, 3, 4, 4) | |
| 2 | | | | | AF4858 | В | 2.00-2.00 | | N = 11 (2, 2, 2, 3, 3, 3) | |
| 3 | Firm becoming stiff brown slightly sandy gravelly CLAY with occasional cobbles. | 9 | | 3.40 | AF4859 | В | 3.00-3.00 | | N = 30 (4, 8, 10, 8, 6, 6) | |
| 4 | | | | | AF4860 | В | 4.00-4.00 | | N = 17 (4, 3, 4, 4, 4, 5) | |
| 5 | | 0.0 | | | AF4861 | В | 5.00-5.00 | | N = 34 (4, 6, 8, 8, 9, 9) | |
| 6 | Very stiff becoming hard black slightly sandy gravelly CLAY with occasional cobbles | | | 6.00 | AF4862 | В | 6.00-6.00 | | N = 49 (6, 6, 9, 10, 12, 18) | |
| 7 | | 0 0 | | | AF4863 | В | 7.00-7.00 | | N = 100/200 mm (14, 20, 35, 35, 30) | |
| 8 | | | | | AF4864 | В | 8.00-8.00 | | N = 54 (6, 8, 12, 12, 14, 16) | |
| 9 | | 0 0 0 0 0 0 0 | | | AF4865 | В | 9.00-9.00 | | N = 55 (7, 8, 11, 14, 14, 16) | |
| | | 1 - A-1 - | | | | | | | | <u> </u> |

From (m) 13696.GPJ IGSL.GDT 5/11/08

CONTRACT

CLIENT

Ξ

ENGINEER

CO-ORDINATES

GROUND LEVEL (m AOD)

BH LOG DCD

To (m)

7.5

HARD STRATA BORING/CHISELLING

(h)

INSTALLATION DETAILS
Date Tip Depth RZ Top RZ Base Туре 13.60 16-10-08 11.50 13.60 50mm SP

Comments

Boulder

REMARKS Hand dug inspection pit excavated to 1.20m. Night work - shift started at 1800hrs.

WATER STRIKE DETAILS

Water Casing Sealed Rise Time Comments Strike Depth То (min)

Comments

GROUNDWATER DETAILS

Date Hole Casing

| Date | Hole Depth | Casing Depth | Depth to Water | Comments |
|----------|---------------|-----------------|-------------------|----------------|
| 12-10-08 | 1.20 | 1,20 | - | End of shift |
| 13-10-08 | 1.20 | 1.20 | - | Start of shift |
| 14-10-08 | 7.00 | 7.00 | - | End of shift |
| 14-10-08 | 7.00 | 7.00 | 6.70 | Start of shift |
| | | | | 1 |

IGSL.GDT 5/11/08

BH LOG DCD

5/11/08

GDT

ISSL

LOG DCD

표

advanced to rockhead and gravel falling in behind hammer

REPORT NUMBER GEOTECHNICAL BORING RECORD 13696 BOREHOLE NO. W2 CONTRACT Dublin Central Development - Draft SHEET Sheet 2 of 3 **CO-ORDINATES RIG TYPE** Dando 3000 **DATE STARTED** 25/09/2008 **BOREHOLE DIAMETER (mm)** DATE COMPLETED 10/10/2008 **GROUND LEVEL (m AOD)** 21.40 **BOREHOLE DEPTH (m)** CLIENT **Dublin Central Developments Ltd** J. Edwards / J. McDonnell **BORED BY** ENGINEER AGL Consulting Ltd **CASING DEPTH (m)** PROCESSED BY S. Letch Samples Standpipe Details Ξ Elevation Ξ Ref. Number Sample Type Recovery Field Test Legend Depth Description Depth (Depth (m) Results 10.00-10.00 AG361 10 - 5 В Grey slightly clayey/silty sandy GRAVEL with many cobbles. Gravel is medium to coarse and subrounded to Ø subangular of limestone. (continued) 2-8 90 70 8 2 9 0 AG3612 11.00-11.00 11 Grey slightly clayey/silty sandy GRAVEL with many 11.20 cobbles and bands of dark grey clay. Gravel is medium to coarse and subrounded to subangular of limestone. Grey slightly clayey/silty sandy GRAVEL with many 11.40 20 ِ وَقَّامَ ا 12 cobbles. Gravel is medium to coarse and subrounded to AG3613 8 12.00-12.00 8000 0000 subangular of limestone. 200 AG3614 13 00-13 00 13 AG3615 14.00-14.00 14 15 AG3616 В 15.00-15.00 15.50 Brown slightly sandy gravelly CLAY with occasional (9-. cobbles <u>ē</u> . ö. AG3617 16.00-16.00 16 $\dot{\succeq}$ ত্ৰ 16.40 Black slightly sandy gravelly CLAY with occasional .O. cobbles \odot Re-set up rig after rotary rig advanced to rockhead gravel falling behind hammer so must be cased off. Ö 19 क HARD STRATA BORING/CHISELLING WATER STRIKE DETAILS Water Sealed Rise Time Time Casing From (m) To (m) Comments Comments Strike Depth (h)(min) 7hrs Chiselling 3hrs Hard Strata Boring 7hrs Chiselling 3hrs Hard Strata Boring 6hrs Chiselling 4hrs Hard Strata Boring Hard Strata Boring Boulder 1hr Chiselling 7hrs Hard Strata Boring 2hrs Chiselling 6hrs Hard Strata Boring 10 10 10 2 3 8 8 12.2 14 16 16.2 14 16 16.2 16.4 **GROUNDWATER DETAILS** 16.4 19.5 19.5 21.4 Hole Casing Depth to Water Date Comments Depth Depth Start of shift End of shift Start of shift End of shift Start of shift 11.00 12.20 4.50 INSTALLATION DETAILS
Date Tip Depth RZ Top RZ Base 4.80 4.80 5.00 Туре

5/11/08 EDI. <u>1</u>88 G BHLOG

REMARKS Hand dug inspection pit excavated to 1.20m Water added from 3.0m to aid drilling. Blowing gravels from 4.9m to 6m bgl. Casing size reduced from 300mm to 250mm diameter at 14.0m bgl. Casing left in borehole to allow rotary follow on Re set up rig on 99/10/98 to advance hole after rotary rig. advanced to rockhead and gravel falling in behind hammer

29-09-08 30-09-08 30-09-08 30-10-08 01-10-08 02-10-08 02-10-08 03-10-08 09-10-08 11.00 11.00 12.20 12.20 14.00 14.00 16.00 16.40 16.40 19.50 12.20 12.20 14.00 14.00 16.00 16.40 16.40 4.50 5.00 4.50 4.90 4.80 5.10 09-10-08

End of shift Start of shift End of shift

Start of shift End of shift Start of shift

| | | | | | | | | | | | | R | EPORT NUMBER | |
|-----------|-------------------------|--|---|-------------------------|----------|-----------|---------------|-----------------|----------------|------------------|---------------|----------|--------------------------|----------------------|
| | | | GEOTE | CHNICA | L BOR | ING F | REC | ORD | | | | | 13696 | |
| CON | NTRACT | Dublin Cent | tral Development - Dra | aft | | | | | | BORE | HOLE I | NO. | W2 Sheet 3 of 3 | _ |
| 20- | ORDINAT | ES | | RIG TYP | PΕ | | | Dando | 3000 | - | START | TED | 25/09/2008 | |
| GRO | DUND LE | /EL (m AOD) | | _ | OLE DIAM | - | nm) | | | DATE | COMP | LETE | ED 10/10/2008 | |
| | ENT SINEER | Dublin Cent AGL Consul | ral Developments Ltd ting Ltd | | DEPTH (m | | | 21.40 | | _ | D BY ESSED | ВҮ | J. Edwards / S. Letch | J. McDo |
| Ē. | | | | | | 5 | Ê | - | | amples | | > | | e e |
| Deptn (m) | | С | Description | | Legend | Elevation | Depth (m) | Ref. | Sample Time | Depth | E) | Recovery | Field Test Results | Standpipe Details |
| 20 | cobbles. | htly clayey/silty Gravel is medi ar of limestone | sandy GRAVEL with um to coarse and sub e. | many rounded to | 8000 | | 20.0 |) | | | | | | |
| 21 | | | | | 0000 | | | | | | | | | |
| | Obstuction End of Be | on - rockhead orehole at 21.4 | 0 m | | | | 21.4 | | | | | | | |
| 22 | | | | | | | | | | | | | | (|
| | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | |
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| | | TA BORING/C | HISELLING | | WATE | R STRI | KE DE | TAILS Sealed | | ise | Time | | | |
| om | (m) To | (m) (h) | Comments | | Strike | | epth | At | | Го | (min) | Co | mments | |
| | | | | | GROUI | | | | <u> </u> | \audle 4: | | | | |
| | | | | | Date | 1 | Hole Depth | Casi Dep | | epth to Water | Com | | s | |
| ISI | [ALLATIC | N DETAILS ip Depth RZ T | | | 10-10- | 08 | 21.40 | 21.4 | 0 | 5.00 | End of | shift | | |
| | | | | Туре | | | | | | | | | | |
| EM | 3.1 Ca | Om to aid drilling. £ asing size reduced | pit excavated to 1.20m. W Biowing gravels from 4.9m I from 300mm to 250mm di ift in borehole to allow rotar 10/08 to advance hole after | to 6m bgl. ameter at | 1 | | | | | | | | | |

IGSL

GEOTECHNICAL BORING RECORD

REPORT NUMBER

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| | ITRA | | | n Centr | ral Development - Dra | ıft | | | | | | - 1 | BOREHO | DLE NO | . BH14 Sheet 1 of 2 | |
| | | NATES | | | | RIG TYP | | | | Dando | 2000 | " | DATE ST | | | |
| GRO | DUND | LEVEL | | | | | OLE DIAMET | • | m) | 200 | | E | DATE CO | OMPLE | TED 13/11/2008 | |
| | ENT | | | | ral Developments Ltd | | OLE DEPTH (| m) | | 12.00 | | | BORED I | | J. McDonnel | I |
| ENG | INEE | κ / | 40L (| Consulti | ing Ltd | CASING | DEPTH (m) | Т | | 12.00 | | ∐F Sam | PROCES ples | o⊏n B | Y S. Letch | |
| Depth (m) | , | | | D | escription | | Legend | Elevation | Depth (m) | Ref. | | Туре | Depth (m) | Recovery | Field Test Results | Standpipe |
| 0 | | | | | ting of granite cobble | lock. | | | 0.10 | | | | | | | W |
| 1 | MAD | E GRO | UND | consis | sting of concrete. sting of brown slightly red brick and concrete | sandy e. | | | 0.20 | AF48 | | NV B | 1.00-1.00 1.00-1.00 | | N = 18 (3, 3, 5, 5, 4, 4) | |
| 2 | | | | | | | | | | AF48 | | NV B | 2.00-2.00 2.00-2.00 | | N = 12 (2, 2, 3, 3, 3, 3) | |
| 3 | Stiff | brown s | lightly | / sandy | gravelly CLAY. | | | - | 3.20 | — AF48 | | NV B | 3.00-3 00 3.00-3.00 | | N = 11 (2, 2, 2, 3, 3, 3) | |
| 4 | | | | | | | | | | AF48 | 335 E | NV B | 4,00-4 00 4,00-4.00 | | N = 22 (3, 3, 5, 5, 6, 6) | |
| 5 | Very | stiff bro | wn s | lightly s | sandy very gravelly Ci | LAY. | 0 0 | | 5.00 | AF48 | 336 | В | 5.00-5.00 | | N = 57 (8, 14, 16, 16, 15, 10) | |
| 6 | | | . = 2 | | | | <u> </u> | | | AF48 | 337 | В | 6.00-6.00 | ı | N = 84 (14, 20, 20, 24, 20, 20 | |
| 7 | occa | sional c | obble | es. Grav | clayey/silty sandy GR vel is fine to coarse at ar of limestone. | | | | 6.50 | AF48 | 338 | В | 7.00-7.00 | , | N = 84 (9, 14, 15, 19, 20, 30) | |
| 8 | | | | | | | 20 20 20 20 20 20 20 20 20 20 20 20 20 2 | | | AF48 | 339 | В | 8.00-8.00 | | N = 100/225 mm (14, 21, 30, 30, 40) | |
| 9 | | | | | | | | | | AF48 | 340 | В | 9.00-9.00 | | N = 100/275 mm (12, 16, 20, 20, 32, 28 | |
| HA | RD S | TRATA | | | HISELLING | | WATER | STRI | KE DE | TAILS | | | | | | KY/ |
| rom | (m) | To (m) | | Fime (h) | Comments | | Water Strike | Cas De | sing pth | Sealed At | d | Rise To | | me nin) | Comments | |
| 8. | 1 | 8.3 | | 1 | Boulder | | 6.60 | 6.0 | | No | | 5.00 | | 5 | Moderate | |
| | | | | | | | CDC:::: | | | TA !! ^ | | | | | | |
| | | | | | | | GROUND Date | | Hole | Cas | | Der | oth to (| Comme | ents | |
| | | | | | | | 10-11-08 | 1 | Depth 6.50 | Dep 6.5 | 0 | | - E | ind of sh | ift | |
| NS] | ALL Date | ATION Tip [| DET/ Depth | RZ T | op RZ Base | Туре | 11-11-08 12-11-08 13-11-08 | | 6.50 9.70 9.70 | 6.5 9.7 9.7 | 'O | 5. | .60 E | Start of sh End of shi Start of sh | ift | |
| REN | IARK | started finishe | iat18 edat2 | 00hrs to 300hrs d | pit excavated to 1 20m Ni accommodate Moore Stre iue to T2 licence restriction ing 20 hours standing, 2 N completed. Cacing loft in b | et traders. Shift s. Standing 5 | t | | | | | | | | | |

IGSL

GEOTECHNICAL BORING RECORD

REPORT NUMBER

| | ITRACT | | olin Centi | ral Development | t - Draft | | | | | | | BOREHOL SHEET | LE NO. | BH14 Sheet 2 of 2 | , |
|-----------|--|--------------------------|-------------------------|---|---------------|------------------------------|-------------|-----------|---------------|-----------------|----------------|------------------|------------|--|----------------------|
| | ORDINA | | | | | RIG TYP | | | | Dando 20 | | DATE STA | | | |
| | DUND LE | | | | - | | OLE DIAME | | | 200 | + | DATE CO | | | |
| CLIE | ENT SINEER | | ilin Centi Consult | ral Development ing Ltd | ts Ltd | | DEPTH (m | | | 2.00 | | BORED B | | J. McDonnell 'S. Letch | |
| | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | , 101 | Contain | ang Eta | | OAGING | DEF III (II | ', | | 2.00 | - | nples | | O. Ector | |
| Depth (m) | | | Г | escription | | | <u> </u> | <u>fi</u> | Depth (m) | ğ | e | _ | ery | Field Test | Standpipe Details |
| eptt | | | L | escription | | | Legend | Elevation | ept | Ref. Number | Sample Type | Depth (m) | Recovery | Results | tand |
| 10 | Vonu do | noo arou | , aliabely | clayey/silty sand | 4. CDAV | /El with | <u>-</u> | Ш | | AF4841 | B Ω ⊢ | 10.00-10.00 | | N = 82 | Ø Ω |
| | occasio | nal cobb | les. Gra | vel is fine to coa | arse and | VEL WILL | \$ 000 B | | | | | | | (9, 13, 16, 19, 22, 25) | |
| | subrour | aea to s | subangu | lar of limestone. | (continu | lea) | 0000 | | | | | | | | |
| 11 | | | | | | | 8 2 | | | AF4842 | 8 | 11.00-11.00 | | N = 100/225 mm (15, 19, 35, 31, 34) | |
| | | | | | | | 0000 | | | | | | | (,0, 10, 00, 01, 04) | |
| | | | | | | | 80 0 | | | | | | | | |
| 12 | End of E | Borehole | at 12.0 | 0 m | | | 0 000 | | 12.00 | | | | | | |
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| | | | RING/CI Time | HISELLING | | | WATE | R STRII | | AILS Sealed | Ris | e Tim | ne L | | |
| rom | .00 00 | (m) | (h) | Comments | | | Strike | De | | At | То | | | omments | |
| | | | | | | | | - 89 | | | | | | | |
| | | | | | | | GROUI | NDWAT | | | | | | | |
| | | | | | | | Date | , נ | Hole Depth | Casing Depth | | ratei | ommen | | |
| NST | ALLAŢI | ON DET | TAII S | | | | 13-11- | 08 | 12.00 | 12.00 | | 5.50 En | d of shift | | |
| D | ate | Tip Dept | h RZ T | op RZ Base | Тур | е | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| REM | ARKS | land dug i | nspection 1800hrs to | pit excavated to 1.2 accommodate Moo | :0m. Night | work - shift aders. Shift | | | | | | | | | |
| | f | nished at ours each | 2300hrs d day totall | ue to T2 licence res ing 20 hours standing | strictions. S | tanding 5 | | | | | | | | | |
| | | lo. Rising Ilow rotar | | completed. Casing I | ett in bore | nole to | - | | | | | | | | |

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GEOTECHNICAL BORING RECORD

REPORT NUMBER

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| СО | NTRAC | T Dub | lin Centra | al Developme | nt - Draf | ft | | | | | | | BOREHO SHEET | DLE N | 10. | BH15 Sheet 1 of 3 | 3 |
| CO | -ORDIN | NATES | | | | RIG TYP | PΕ | | | D | ando 15 | 50 T | DATE S | FART | ED | 15/09/2008 | |
| GR | OUND | LEVEL (n | n AOD) | | | | OLE DIA | | • | - | 00 | | DATE C | OMPL | .ETED | 24/09/2008 | |
| | IENT GINEEF | | lin Centra Consultir | al Developme | nts Ltd | | OLE DEP DEPTH | | n) | | 1.20 1.20 | | BORED PROCES | | RV | J. McDonne S. Letch | ell |
| | SINCE | , AGL | Consulti | ig Eta | | CASING | DEFIN | (III) | Т | | 1.20 | | ples | JOED | <u> </u> | S. Leich | T |
| Depth (m) | | | De | scription | | | Legend | | Elevation | Depth (m) | Ref. Number | Sample Type | Depth (m) | Recovery | | Field Test Results | Standpipe |
| 1 2 3 4 5 6 7 | Very of with o | E GROUN lly clay wit | D consist h some r | clayey/silty s Gravel is fine ar of limestor | slightly s and con | AVEL | 0 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX | | 3.50 | AF4821 AF4822 AF4823 AF4824 AF4825 AF4825 AF4826 | B B B B B B B | 1.20-1.20 2.00-2.00 3.00-3.00 4.00-4.00 5.00-5.00 7.00-7.00 | | (12. | N = 4 (1, 1, 1, 1, 1, 1) N = 7 (1, 2, 2, 2, 1, 2) N = 17 (4, 4, 4, 3, 2, 8) N = 111 , 16, 25, 30, 27, 29 N = 100/150 mm (35, 48, 52) N = 17 (4, 6, 4, 5, 4, 4) N = 56 , 9, 11, 16, 15, 14 | 33) |
| 9 | | | | | | | \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ | # | | | AF4829 | В | 9.00-9 00 | | (9, | N = 87 11, 16, 25, 20, 26 | , |
| HA | RD ST | RATA BO | | HISELLING | | | | ER S | | | | r | | | -1 | | |
| | · 1 | To (m) | (n) | Comments | | | Wate Strik | te | Casino Depth | | ealed At | Rise To | (n | me nin) | Comr | | |
| 3 | i.5 i.9 i.8 | 3.8 4 5 | 0.5 E | Boulder Boulder Boulder | | | 6.0 | 0 | 6.00 | | No | 4.70 |) | 5 | Mod | lerate | |
| 5 1 | i.8 I1 | 6 14.4 | 0.5 8 8 8 | Boulder Hard Strata Boring | 9 | | GRO | NDM | | | | | | | | | |
| 1€ | 4.4 5.7 8.5 | 16.7 18.5 21 | 8 1 | Hard Strata Boring Hard Strata Boring Hard Strata Boring | j | | Da | te | Ho Dep | | Casing Depth | Dej W | oth to ater | Comm | ents | | |
| 2 | 21 | 21.2 | 2 8 | Hard Strata Boring Boulder | , | | 15-09 16-09 | 9-08 | 3.5 3.5 | i0 i0 | 3.50 3.50 | | - E | nd of sl tart of s | shift | | |
| | Date | TION DE | h RZ To | p RZ Base | Ту | pe | 16-09 17-09 | 9-08 | 6.0 6.0 | ю | 6.00 6.00 | | - [E | ind of sl start of s | hift | | |
| REI | MARKS | Hand dug ir 3.5m to aid | | t excavated to 1.2 | 0m. Water | added from | | | | | | | | | | | |



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GEOTECHNICAL BORING RECORD

REPORT NUMBER

13696

BOREHOLE NO. CONTRACT **Dublin Central Development - Draft BH15** SHEET Sheet 2 of 3 **CO-ORDINATES RIG TYPE** Dando 150 **DATE STARTED** 15/09/2008 **BOREHOLE DIAMETER (mm)** DATE COMPLETED 24/09/2008 **GROUND LEVEL (m AOD)** 200 **BOREHOLE DEPTH (m)** 21.20 CLIENT **Dublin Central Developments Ltd BORED BY** J. McDonnell **ENGINEER** CASING DEPTH (m) PROCESSED BY AGL Consulting Ltd 21.20 S. Letch Samples Standpipe Details Depth (m) Ξ Elevation Ref. Number Sample Type Recovery Field Test Legend Description Depth Depth (m) Results 10.00-10.00 N = 54 (7, 10, 11, 11, 17, 15) - 10 Very dense grey slightly clayey/silty sandy GRAVEL with occasional cobbles. Gravel is fine to coarse and subrounded to subangular of limestone. (continued) والمصارة AF4831 В 11.00-11.00 (3, 5, 9, 9, 14, 15) AF4832 ₿ 12.00-12.00 12 (5, 7, 20, 15, 16, 18) N = 100/150 mm (3, 11, 26, 74) AF4833 13.00-13.00 13 AF4834 В 14.00-14.00 14.50-14.50 1% rec 150 blows Hard black slightly sandy gravelly CLAY with 14.40 AF4835 U occasional cobbles 15 N = 100/240 mm (11, 15, 20, 25, 45, 10) AF4836 8 15.50-15.50 N = 100AF4837 В 16.50-16.50 (10, 15, 19, 24, 30, 27 17 AF4838 В 17.50-17.50 (20, 29, 40, 60) 18 N = 100/210 mmAF4839 В 18.50-18.50 19 N = 100/180 mm AF4840 19.50-19.50 (12, 30, 36, 44, 20) HARD STRATA BORING/CHISELLING **WATER STRIKE DETAILS** Time Water Casing Sealed Rise Time Comments From (m) To (m) Comments Strike Depth To 3.8 4 5 6 14.4 16.7 18.5 21 0.5 0.5 Boulder GDT 1/10/08 3.9 4.8 5.8 Boulder Boulder Boulder 0.5 **GROUNDWATER DETAILS** 11 14.4 16.7 Hard Strata Boring Hole Depth to Water Casing Date Comments IGSL Depth Depth 18.5 11.00 11.00 14.40 14.40 16.70 16.70 18.50 17-09-08 5 50 End of shift 11 00 11.00 11.00 14.40 14.40 16.70 16.70 18.50 18.50 17-09-08 18-09-08 18-09-08 19-09-08 19-09-08 22-09-08 22-09-08 5.50 5.80 5.80 Start of shift End of shift INSTALLATION DETAILS
Date Tip Depth RZ Top RZ Base Type Start of shift 6.40 6.10 6.50 6.40 End of shift Start of shift End of shift REMARKS Hand dug inspection pit excavated to 1.20m. Water added from 3.5m to aid drilling. Start of shift 23-09-08



GEOTECHNICAL BORING RECORD

REPORT NUMBER

| Ina | 327 | | | | | | | | | | | 13090 | |
|---------------|---------------------|---|--|------------|-----------|-----------|----------------|----------------|----------------|------------------|-------------|--|----------------------|
| COI | NTRACT | Dublin Cer | ntral Development - Dra | ft | | | | | | BOREHO | LE NO | | |
| CO- | ORDINA | res | | RIG TYPI | E | | | Dando 1 | t | SHEET DATE ST | ADTER | Sheet 3 of 3 15/09/2008 | |
| GRO | DUND LE | VEL (m AOE | 0) | BOREHO | | IETER | (mm) | 200 | | | | TED 24/09/2008 | |
| CLII | ENT | Dublin Cer | ntral Developments Ltd | BOREHO | LE DEP | ГН (m) | | 21.20 | | BORED E | 3Y | J. McDonnel | I |
| ENG | INEER | AGL Cons | ulting Ltd | CASING | DEPTH (| m) | т- | 21.20 | | PROCES | SED B | Y S. Letch | т |
| Ê | | | | - | _ | ٤ | <u>E</u> | <u></u> | τ – | nples | 2 | - Field Teek | <u>e</u> |
| Depth (m) | | | Description | | Legend | Flevation | Depth (m) | Ref. Number | Sample Type | Depth (m) | Recovery | Field Test Results | Standpipe Details |
| | 11161- | 1. 1: 1.41. | B. OLAY | | 9 | ı | کّ از | řž | ÿ <u>←</u> | 105 | - a | | \$ 5 5 |
| 20 | occasion | al cobbles (c | ndy gravelly CLAY with continued) | Ĭ | | | | | | | | | |
| 21 | | | | <u> </u> | <u>a</u> | | | AF4841 | В | 20.50-20.50 |) | N = 100/175 mm (13, 29, 35, 42, 23) | |
| 21 | | | | ļ. | 9.6 | | | | | | | | |
| [| End of B | orehole at 21 | .20 m | | | | 21.20 | ס | | | | | |
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| НА | RD STRA | TA BORING | G/CHISELLING | | WATI | ER STE | RIKE DE | P HATE | | <u> </u> | | | |
| From | | (m) Time | Comments | | Wate | r C | asing | Sealed | Ris | | | comments | |
| 3. | 5 3. | 8 0.5 | Boulder Boulder | | Strike | <u> </u> | epth | At | To | <u>) (m</u> | 11) | | |
| 4. 5. | 8 6 | 0.5 | Boulder Boulder | | GROU | INDIA/A | TED D | ETAILS | 1 | | | | |
| 1 14 16 | .4 16 | .7 8 | Hard Strata Boring Hard Strata Boring Hard Strata Boring | | Dat | | Hole | Casing | | pth to C | ommer | nts | |
| 18 2 | 1.5 2 1 21 | 1 6 .2 2 | Hard Strata Boring Boulder | | 23-09- | | Depth 21.20 | Depth 21.20 | | vater | nd of shift | | |
| | TALLATIO Date Ti | DN DETAILS p Depth RZ | | pe | \exists | | | | | | | | |
| | | | | | | | | | | | | | |
| REN | MARKS H | und dug inspection om to aid drilling. | n pit excavated to 1.20m. Water | added from | - | | | | | | | | |
| | J., | to alla arming. | | | | | | | | | | | |



REPORT NUMBER

| COI | NTR | ACT | | Dublin | Central D | evelopme | ent - Dra | aft | | | | | | DRILI | HOLE N | 0 | OW | 1 | (|
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| _ | | | | | | | | Τ. | | | | | | SHEE | | | Shee | t 1 of 4 | |
| CO- | ORI | ANIC | TES(| (_) | | | | | | LEVEL (m) | | | | T . | STARTI | | | 9/2008 | |
| | | | | | | | | _ | | METER (mm | 1) | | | DATE | COMPL | ETED | 16/09 | 9/2008 | |
| | ENT | | | | Central D | | ents Ltd. | | ICLINATIO | ON | | | -90 | | ED BY | | | nnium | |
| | INE | ER | A | GL C | Consulting E | Engineers | | F | LUSH | | | | Polymer G | el LOGO | SED BY | 1 | A. Ma | ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fract Spac (mr | cing m) | Legend | Non-intact zones (shaded) | Strata | description | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) | |
| 1 | | | | | | | | | made q | on Pit - d by driller as round consis I and cobbles | tina | 1.20 | | | | | | | |
| 2 | | | | | | | | | HOLE D Observe madegre | TRIX OPEN PRILLING: ed by driller a bund consist wood and cl | s ing | | | | | | 717887178871788717 777887778877788777 777887778877 | | (|
| 5 | | | | | | | | | HOLE D | TRIX OPEN PRILLING: ed by driller a of gravel | | 4.20 | | | | | XXII XXII XXII XXII XXII XXII XXII XXI | | (|
| NST [| ٠ | | | | | | | | | | | | | | | | <u>KOTTKOTTKOTTKOTTKOTTKOTTKOTT</u> KOTTKOTTKOTTKOTTKOTTKOTTKOTTKOTTKOTTKOT | | |
| REM | IARI | | | | | | | | 551 | INSTALLA | TION | REM | ARKS | | - | | | | |
| land | d du | g ins | pecti | on pit | t to 1.2m. | | | | | Headworks | | | | | | | | | |
| | | | | | | | | | | CDOLES | | D 05 | FAU O | | | | | | |
| | | | | | | | | | | GROUNDY | | | | | | | | | |
| | | | | | | | | | | Date | | ole epth | Casing Depth | Depth to Water | Comm | ents | | | |
| _ | | | | | | | | | | | | , | | | | | | | 1 |
| IST | | | | ETA | | | | | | | | | | | | | | | (|
| <u> </u> |)ate)9-0 | | Гір D 13.5 | | RZ Top 10.50 | RZ Base 13.50 | | Type nm S | P | | | | | | | | | | |
| 6-0 |)9-0)9-0 | | 33.0 | 00 | 27.00 | 33.00 | | nm S | | | | | | | | | | | |



REPORT NUMBER

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| co | NTR | ACT | D | ublin | Centr | al De | velopme | ent - Dra | aft | | | | | DRILLI SHEET | HOLE N | 0 | OW Shee | 1 t 2 of 4 | |
| СО | -ORI | OINA. | TES(| _) | | | | | G | ROUND L | EVEL (m) | | | | STARTE | ED . | | 9/2008 | |
| | | | | | | | | | _ | | VIETER (mm | - | | DATE | COMPL | ETED | 16/09 | 9/2008 | |
| 1 | IENT GINE | | | | | | velopme | ents Ltd | ٠ | ICLINATIO | ON | | -90 Dahuman C | DRILLI | | | | nnium | |
| \vdash | | EK | A | JL U | onsulti | ng En | gineers | | | LUSH | | | Polymer G | el LOGGI | -D RA | | A, Ma | anony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | s.c.R.% | R.Q.D.% | S | ractu Spacir (mm) 250 | ng) 500 | Legend | Non-intact zones (shaded) | | description | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) | |
| 11 12 | | | | | | | | | | HOLE D | | | | | | | | | |
| 14 | | | | | | | | | | HOLE D | TRIX OPEN RILLING: ed by driller a: of clay and | | | | | | | | |
| 17 | | | | | | | | | | HOLE D | TRIX OPEN PRILLING: and by driller and the clay | | | | | | | | |
| - 19 - | | | | | | | | | | | | 19.20 | | | | | | | |
| - | MAR | | | | | | | | | | INSTALLA | TION REM | IARKS | | | | | | |
| Har | nd du | ıg ins | pection | on pit | to 1.2 | lm. | | | | | Headworks | | | | | | | | |
| | | | | | | | | | | | GROUNDY | VATER DE | TAILS | | | | | | |
| | | | | | | | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comm | ents | | | |
| L_ | | | | | | | | | | | | Dehiii | Depui | 170.01 | | | | | |
| | | | ON D | | | -1- | | | - | | | | | | | | | | |
| | Date -09-0 | | <u> 13.5</u> | | RZ To 10.5 | | Z Base 13.50 | | Type mm S | | | | | | | | | | |
| 16 | -09-0 | าล | 33.0 | õΙ | 27.0 | | 33.00 | 50 | mm S | P | | | | | Į. | | | | |



REPORT NUMBER

| CONTRAC | er D | ublin | Central | Developme | ent - Dra | ff | | | | | | DE | 211 1 1 | IOLE N | 0 | ow | 1 | $\overline{}$ |
|---|----------------|---------|----------------|------------------------|---|---------------------------|--|--|---|-------------------------|------------------|---------------|----------|-----------------|-----------|-------------------|------------------|---------------|
| CONTINAC | ,, , | , abii | Centrari | Sevelopini | ziii - Die | _ | | | | | | 1 | IEET | | | | t 3 of 4 | |
| CO-ORDIN | IATES(| _) | | | | | | LEVEL (m) METER (mn | 1) | | | | | STARTE COMPL | | | 9/2008 9/2008 | |
| CLIENT ENGINEER | | | | Developme Engineers | ents Ltd. | | CLINATI | ON | | | -90 Polymer G | | | D BY | | | nnium ahony | |
| Downhole Depth (m) Core Run Depth (m) | S.C.R.% | R.Q.D.% | Spa | | Legend | Non-intact zones (shaded) | Strata | a description | | Depth (m) | Dis | continuit | ties | | Elevation | Standpipe Details | SPT (N Value) | |
| 20 21 22 23 24 25 | | | | | 0 1 1 1 0 8 0 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | HOLE I Observe returns gravel (i SYMME HOLE I Observe returns SYMME HOLE I Observe returns rock OPEN H DRILLIN | ETRIX OPEN DRILLING: ed by driller a of weathered HOLE NG: No recoved by driller a | es de la companya de | 20.70 21.50 22.00 | | | | | | | | (|
| 28 29 28 REMARKS Hand dug in Date 16-09-08 16-09-08 | | on pit | to 1.2m. | | | | | INSTALLA Headworks GROUND | VATE | R DET | Casing | Depth | to | Comm | ents | | | |
| | | | | | | | | Date | | epth_ | Depth | Depth Wate | io er | Comm | ents | | | |
| NSTALLA | TION D | ETA | ILS | | | | | | | | | | | | | | | (|
| Date | | | | RZ Base | | уре | .n | | | | | | | | | | | |
| 16-09-08 16-09-08 | 13.50 33.00 | 0 | 10.50 27.00 | 13.50 33.00 | | nm S nm S | | | | | | | | | | | | |



REPORT NUMBER

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| | NTR | ACT | | ublin | Central Developme | ent - Dr | ant ——— | | | | | SHEET | HOLE N | | OW ¹ Shee | 1 t 4 of 4 |
| CO- | ORE | DINA. | TES(| _} | | | | | LEVEL (m) METER (mm) | | | | STARTE COMPLI | | | 0/2008 0/2008 |
| | ENT | | | | Central Developme | ents Ltd | . | NCLINATIO | ON | | -90 Polymer Gel | DRILL | | | Miller A. Ma | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | Strata | description | Depth (m) | Disco | ontinuities | | Elevation | Standpipe Details | SPT (N Value) |
| 31 | | | | | | | | OPEN H DRILLIN observer returns of (continu | IG: No recovery, d by driller as of rock. | | | | | | | |
| 33 | | | | | | | | End of C | Corehole at 33 | 33.00 | | | | | | |
| 35 | | | | | | | | | | | | | | | | |
| 36 | | | | | | | | | | | | | : | | | |
| 37 | | | • | | | | | | | | | | | | | |
| 38 | | | | | | | | | | | | | | | | |
| 39 | | | | | | | | | - Language | | A DICC | | | | | |
| | IARI d du | | pection | on pit | t to 1.2m. | | | | INSTALLATIO Headworks. | NKEM | IAKKS | | | | | - |
| | | | | | | | | | GROUNDWAT | ER DE | TAILS | | | | | . 44 |
| | | | | | | | | | Data | lole epth_ | Casing Depth | Depth to Water | Comm | ents | | <u> </u> |
| NS1 | ΓALI | LATI | ON D | ETA | ILS | | | | | | | | | | | 4 |
| | Date | | ip Do | | RZ Top RZ Base | | Type mm S | | | | | | | | | |
| | 09-0 09-0 | | 13.5 33.0 | | 10.50 13.50 27.00 33.00 | 50 | mm S | SP. | 5 | | | | | | | |



REPORT NUMBER

| co | NTR. | ACT | D | ublin | Central [| Developme | ent - Dr | aft | | | | | | 1 | LHOLE N | 10 | RC | | (|
|--------------------|--------------------|---------|---------|---------|-------------------|--------------------------------|----------|---------------------------|----------|---|-------|-----------|-----------|-------------------|---------|-----------|--|---------------|-----|
| _ | | | | | | | | T | | | | | | SHEE | Τ | | Shee | t 1 of 33 | |
| co | -ORI | DINA | TES(| _) | | | | | | LEVEL (m) | | | 400 | 1 | START | | | 9/2008 | |
| _ | | | | | | | | - | | METER (mn | n) | | 102 | DATE | COMPL | EIED | 14/0 | 9/2008 | |
| | IENT | | | | | Developme | ents Ltd | . | NCLINATI | ON | | | -90 | | LED BY | | | nnium | |
| | GINE | ER. | A | GL C | onsulting | Engineers | | F | LUSH | | | - 1 | Polymer G | el LOG | GED BY | | A. Ma | ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (m | cing m) 0 ₅₀₀ | Legend | Non-intact zones (shaded) | De | escription | | Depth (m) | Dis | continuities | š | Elevation | Standpipe Details | SPT (N Value) | |
| 0 | | | | | | | | | made qu | d by driller a: round consis I, sand, brick | tina | | | | | | KULEKUIKUILKULIKULIKUILKUILKUILKUILKUILKUILK | | |
| REI | MAR | KS | | | | | | | l . | INSTALL | ATION | REM | ARKS | 7.0 | | I | MMK | | |
| | | | pecti | on pit | t to 1.2m. | | | | | Headworks | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | GROUND | | | | | | | | | |
| | | | | | | | | | | Date | | ole | Casing | Depth to Water | Comm | ents | | | |
| | | | | | | | | | | | De | pth | Depth | vvater | 1 | | | | ن ر |
| INS | TALI | LATI | ON D | EΤΔ | ILS | | | | | 1 | | | | | | | | | (|
| _ | Date | | - | - | RZ Top | RZ Base | | Туре | | | | | | | | | | | |
| 14- | -09-0 | 8 | 13.0 | 00 | 6.00 | 13.00 | 50 | mm S | SP. | 1 | | | | | ļ | | | | |
| | -09-0 | | 32.5 | 50 | 26.50 | 32.50 | | mm S | | | | | | | | | | | |



REPORT NUMBER

| | _ | | | | | | | | | | | | | | | | | |
|--------------------|----------------------|---------|----------------|---------|----------------------|--------------------------------|-----------|---------------------------|---------------------|---|----------|-----------|------------------|-------------------|--------|-----------|--|----------------|
| CO | NTR/ | ACT | D | ublin | Central E | Developme | ent - Dra | aft | | · | | | | DRILLI SHEET | HOLE N | 0 | RC0 | 8 t 2 of 33 |
| СО | ORE | OINA. | TES(| _) | | | | | | .EVEL (m) | | | | DATE | STARTE | | 13/09 | /2008 |
| | | | | | | | | | | METER (mm | 1) | | 02 | | COMPLI | ETED | 14/09 | /2008 |
| | ENT SINE | ER | | | Central Donsulting I | Developme Engineers | ents Ltd | . | NCLINATIO LUSH | ON | | | 90 Polymer Ge | DRILL LOGG | | | Miller A. Ma | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spac (mi | cing m) ⁰ 500 | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 1 | | | | | | | | | made gr of grave | on Pit - d by driller as ound consist l, sand, brick er. <i>(continue</i> | ting | | | | | | <u> </u> | |
| | | | | | | | | | HOLE D | TRIX OPEN RILLING: d by driller a: of gravelly cla bles | s | 1.20 | | | | | 78811188111881118811188111881 78811188111881118811188111881 78811188111881118811188111881 | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | 88.11,88.11,88.11,188.11,188.11,88.1 | |
| | MARI | | | | | | | | | INSTALLA | TION | REM/ | ARKS | | | | | |
| Han | d du | g ins | pection | on pit | t to 1.2m. | | | | | Headworks | š. | | | | | | | |
| | | | | | | | | | | GROUNDY | _ | | | | | | | Yan |
| | | | | | | | | | | Date | Ho De | | Casing Depth | Depth to Water | Comm | ents | | |
| | | | | | | | | | | | | | | | | | | |
| | | | ON D | | | 07.5 | I | T | | | | | | | | | | |
| | <u> 2ate</u> 09-0 | | Tip Do 13.0 | | RZ Top 6.00 | RZ Base 13.00 | | Type mm 9 | | | | | | | | | | |
| | 09-0 | | 32.5 | | 26.50 | 32.50 | 50 | mm S | SP | | 1 | | | | 1 | | | |



REPORT NUMBER

| CO-ORDINATES(_) GROUND LEVEL (m) CORE DIAMETER (mm) INCLINATION FLUSH Fracture Spacing (mm) Pueges (mm) Pueges Symmetrix OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay with cobbles (continue) | Depth (m) | 102 -90 Polymer Gel Disco | | Elevation | 13/09 14/09 Maler Standpipe Details Maler Standpipe Details Maler | | |
|---|---------------|------------------------------------|---------------------------|-----------|---|----------------|---|
| CORE DIAMETER (mm) CLIENT ENGINEER Dublin Central Developments Ltd. AGL Consulting Engineers Fracture Spacing (mm) Public System of Core DIAMETER (mm) INCLINATION FLUSH Description Public System of Core DIAMETER (mm) FLUSH Description SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clav | Depth (m) | -90 Polymer Gel | DATE C DRILLE LOGGE | Elevation | Miller Way (1/2/1/2/1/2/1/2/1/2/1/2/1/2/1/2/1/2/1/2 | nnium ahony | |
| ENGINEER AGL Consulting Engineers FLUSH Fracture Spacing (mm) Public System (mm) Public System (mm) Public System (mm) Public System (mm) Public System (mm) Public System (mm) Symmetrix Open Hole Drilling: Observed by driller as returns of gravelly clav | Depth (m) | Polymer Gel | LOGGE | Elevation | TAX///AX///AX///AX///AX///AX///AX///AX/ | hony | |
| 2 SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clav | ; V | Disco | ntinuities | | 118X1118X1118X1118 118X1118X1118X1118 | SPT (N Value) | |
| HOLE DRILLING: Observed by driller as returns of gravelly clav | ٧ | | | | | | (|
| with cobbies (continue) with cobbies (continue) with cobbies (continue) SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay | 2.70 | | | | \$\overline{1}\text{\$\}\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\ | | |
| REMARKS INSTALLAT | TION DEM | ADVC | | | | | |
| REMARKS INSTALLAT Hand dug inspection pit to 1.2m. Headworks. | | CAAL | | | | | |
| | | | <u> </u> | | | | = |
| GROUNDW | | | D | | | | |
| Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | |
| INSTALLATION DETAILS | | | | | | | (|
| INSTALLATION DETAILS Date Tip Depth RZ Top RZ Base Type | | | | | | | , |
| 14-09-08 13.00 6.00 13.00 50mm SP 14-09-08 32.50 26.50 32.50 50mm SP | | | | | | | |



REPORT NUMBER

| С | ONTI | RACT | D | ublin | Central I | Developme | ent - Dra | ft | | | • | | · <u>-</u> | | HOLE N | 0 | RC | |
|----|--------------------|---------------|--------------|------------|--------------------------------------|--------------------------------|------------|---------------------------|-----------|---|------|-----------|------------|-------------------|--------------------|-----------|---|----------------------|
| С | O-OF | RDINA | TES(| _) | | | | 6 | ROUND I | LEVEL (m) | | | | SHEE | <u>I</u> STARTI | ED | | et 4 of 33 9/2008 |
| L | | | | | | | | _ c | ORE DIA | METER (mm |) | | 02 | | COMPL | | | 9/2008 |
| 1 | LIEN | | | | | Developme | nts Ltd. | | ICLINATIO | ON | | | 90 | | ED BY | | | nnium |
| - | NGIN | $\overline{}$ | T A | GLC | onsulting | Engineers | | | LUSH | | | <u> </u> | Polymer Ge | el LOGG | ED BY | | <u>А. М</u> | ahony |
| | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (m ₀ 25 | cing m) ⁰ 500 | Legend | Non-intact zones (shaded) | | scription | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| | | | | | | | | | HOLE D | TRIX OPEN PRILLING: ed by driller a of gravelly cla ed) | s | | | | | | SCII KAII KAII KAII KAII KAII KAII KAII K | |
| `— | EMAI | | | ŧ. | | | | | | INSTALLA | TION | REM/ | ARKS | | | | MM | |
| Н | and d | ug ins | pecti | on pit | to 1.2m. | | | | | Headworks | s. | | | | | | | |
| | | | | | | | | | | GROUNDY | VATE | R DET | AILS | | | ···- | | |
| | | | | | | | | | | Date | Н | ole | Casing | Depth to Water | Comm | nents | | <u> </u> |
| | | | | | | | | | | 2410 | De | pth | Depth | vvater | 1 3011111 | | | |
| IN | ISTA | LLAT | ON E | ETA | ILS | | | | | İ | | | | | | | | |
| F | Dat | | | | | RZ Base | | Гуре | .n | | | | | | | | | |
| | 4-09- 4-09- | | 13.0 32.5 | 50 50 | 6.00 26.50 | 13.00 32.50 | 50ı 50ı | nm S nm S | SP | | | | | | | | | |



REPORT NUMBER

| 1 | NIK | ACT | C | ublin | Central D | evelopme | ent - Dra | aft | | | | | | DRILI | HOLE N | 10 | RC | | 1 |
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| | | | | | | | | Τ. | | | | | | SHEE | T | | | t 5 of 33 | |
| co | -ORI | OINA. | TES(| _) | | | | | | LEVEL (m) | | | 100 | , | STARTI | | | 9/2008 | |
| | | | | | | | | | | METER (mm | 1) | | 102 | - | COMPL | EIED | 14/0 | 9/2008 | |
| | ENT | | | | Central D | | ents Ltd | | NCLINATIO | ON | | | 90 | 1 | ED BY | | | nnium | |
| \vdash | GINE | EK | A | GL C | Consulting E | ngineers | | F | LUSH | - | | | Polymer G | el LOGO | ED BY | | A. Ma | ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fract Spac (mn | n) ₅₀₀ | puesen | Non-intact zones (shaded) | | scription | | Depth (m) | Dis | continuities | : | Elevation | Standpipe Details | SPT (N Value) | |
| 4 | | | | | | | | | HOLE D Observer returns of (continu | TRIX OPEN PRILLING: ed by driller a | s ay | 4.20 | | | | | KUITKUITKUITKUITKUITKUITKUITKUITKUITKUIT | | |
| REI | MAR | KS | | | | | 19 -1 | | | INSTALLA | NOITA | REM | ARKS | | | | ia va va | | |
| Har | d du | g ins | pectio | on pit | to 1.2m. | | | | | Headworks | 3. | | _ | | | | | | |
| | | | | | | | | | | 00000000 | | | -411 - | | | | | | |
| | | | | | | | | | | GROUND | _ | | | | | | | | |
| | | | | | | | | | | Date | | ole epth | Casing Depth | Depth to Water | Comm | ents | | | |
| 45 | | | | | | | | | | | | | | | | | | | 1 |
| _ | | | | ETA | | | | | | | | | | | | | | | (|
| | Date | | | | | RZ Base | | Туре | en. | | | | | | | | | | |
| | -09-0 -09-0 | | 13.0 32.5 | | 6.00 26.50 | 13.00 32.50 | 50r | nm S | SP | | | | | | | | | | |



REPORT NUMBER

| C | ONTR | ACT | D | ublin | Central [| Developme | ent - Dra | aft | | | | | | | HOLE N | 0 | RC | |
|-------------------|--|---------|---------|---------|--------------------------------------|--------------------------------|-----------|---------------------------|-----------|---|------------|-------------|------------------|-------------------|--------|-----------|---|----------------------|
| C | O-QR | DINA | TES(| _) | | | | | SROUND I | LEVEL (m) | | | | SHEE | STARTI | ED | | et 6 of 33 9/2008 |
| | | | | | | | | C | ORE DIA | METER (mm |) | 1 | 102 | DATE | COMPL | ETED | 14/09 | 9/2008 |
| | LIENT | | | | | Developme | nts Ltd | . 11 | NCLINATIO | ON | | - | 90 | | ED BY | | | nnium |
| \vdash | NGINE | ER | Α | GL C | onsulting | Engineers | T 1 | F | LUSH | | | F | Polymer G | el LOGO | ED BY | | A. M | ahony |
| Owwhole Death (m) | | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (m ₀ 25 | cing m) ⁰ 500 | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 5 | | | | | | | | | HOLE D | TRIX OPEN PRILLING: and by driller a of gravel. ed) | | | | | | | XIII KATI KATI KATI KATI KATI KATI KATI K | |
| _ | EMAR | | | | | | | | | INSTALLA | TION | REM/ | ARKS | | | | 127-127-12 | |
| Ha | and di | ıg ins | pection | on pit | to 1.2m. | | | | | Headworks | 5 . | | | | | | | |
| | | | | | | | | | | GROUNDV | VATE | R DET | AILS | | | | | |
| | | | | | | | | | | Date | | ole epth | Casing _Depth | Depth to Water | Comm | ents | | |
| | | | | | | | | | | 1 | 9ب | ф.И.I | _rehui_ | rate | | | | |
| IN | NSTALLATION DETAILS | | | | | | | | | | | | | | | | | |
| 1 | Date Tip Depth RZ Top RZ Base Type 14-09-08 13.00 6.00 13.00 50mm Si | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | SP | | | | | 222 | | | | |



REPORT NUMBER

| co | NTR | ACT | | ublin | Central [| Developm | ent - Dra | aft | | | | | | | LHOLE N | 10 | RC | | (|
|--------------------|--------------------|---------|---------------|----------|--------------------|--------------------------------|-----------|---------------------------|-----------------|---|-------|-----------|-----------------|-------------------|---------|-----------|-------------------|----------------------|---|
| co | -ORI | DINA | TES(| <u> </u> | | | | (| GROUND I | LEVEL (m) | | | | SHE | E START | FD | | et 7 of 33 9/2008 | |
| | | | | _, | | | | c | ORE DIA | METER (mr | n) | | 102 | | E COMPL | | | 9/2008 | |
| | IENT GINE | | | | Central E | - | ents Ltd. | | NCLINATION LUSH | ON | | | 90 Polymer G | | LLED BY | | | nnium ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (m) | cing m) o ₅₀₀ | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Dis | continuitie | es | Elevation | Standpipe Details | SPT (N Value) | |
| REI Har | | | | | | | | | HOLE D | TRIX OPEN PRILLING: d by driller a of gravel. ed) | | | | | | | | | |
| REI | MAR | | | | | | 1-01 | | | INSTALL | ATION | REM | ARKS | | | · | | 1 | |
| Har | nd du | g ins | pecti | on pil | t to 1.2m. | | | | | Headwork | s. | | | | | | | | |
| | | | | | | | | | | GROUND | WATE | R DET | TAILS | | | | | | |
| | | | | | | | | | | Date | Н | ole | Casing | Depth to Water | O Comm | nents | | | |
| | | | | | | | | | | | De | epth | Depth | vvatel | | | | | |
| INS | TALI | | | | | | | | | | | | | | | | | | (|
| - | Date -09-0 | | Tip D 13.0 | | RZ Top 6.00 | RZ Base 13.00 | | Type nm S | | | 1 | | | | | | | | |
| 14 | -09-0 | | 32.5 | io | 26.50 | 32.50 | | nm S | | | | | | | | | | | |



REPORT NUMBER

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| COI | NTR/ | ACT | D | ublin | Centra | al Dev | /elopm | ent - Dra | aft | | | | | | DRI SHE | LLHOLE N | 10 | RCC | 8 t 8 of 33 |
| CO | ORE | ANK | TES(| _) | | | | | | | LEVEL (m) | | | | DAT | E STARTI | | 13/09 | /2008 |
| | | | | | | | | | Н | ORE DIAI NCLINATIO | METER (mm | 1) | | 02 90 | - | E COMPL | ETED | | |
| | ENT SINE | | | | Centra onsultir | | - | ents Ltd | . | LUSH | 3 14 | | | olymer Ge | | LLED BY GED BY | | Miller A. Ma | nnium Ihony |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | S | ractur pacin; (mm) | g 500 | Legend | Non-intact zones (shaded) | | scription | Contt (m) | () | Disc | continuitie | es | Elevation | Standpipe Details | SPT (N Value) |
| 7 | | | | | | | | | | HOLE D | | | THE THE PARTY OF T | | | | | | |
| REN | | | nantio | n nit | to 1 2 | | | | | | INSTALLA | TION RE | MA | ARKS | | | | | |
| пап | u uu(| y irisį |) JUST | лі рії | to 1.2r | ш. | | | | | Headworks | | | | | | | | |
| | | | | | | | | | | | GROUND | | ET. | | Darth 1 | _ | | | |
| | | | | | | | | | | | Date | Hole Depth | _ | Casing Depth | Depth t Water | Comm | nents | | |
| | | | | | | | | | | | | | | | | | | | |
| | - IA7 | ΔΤΙ | JN P | FTA | II S | | | | | | | | | | | | | | |
| | Γ AL L Date | _ATK | ip De | | RZ To | p R2 | Z Base | | Туре | | | | | | | | | | |



REPORT NUMBER

| co | NTR | ACT | D | ublin | Central E | Developmo | ent - Dra | aft | | | | | | 5 | | OLE N | 0 | RC | | (|
|--------------------|--------------------|---------|---------------|---------|--------------------|--------------------------------|-----------|---------------------------|-----------|-----------|-----------|-------------|-----------------|---------------|------|-------|-----------|-------------------|------------------|---|
| _ | | | | | | | | | CBOLIND | LEVEL (m) | | | | | EET | | | | et 9 of 33 | |
| co | -ORI | DINA | TES(| _) | | | | | | | \ | | 102 | | | TARTE | | | 9/2008 9/2008 | |
| _ | | | | | | | | ⊢. | | METER (mr | n) | | | _ | | | -120 | | | |
| | ENT | | | | | Developme | ents Ltd | ' | NCLINATIO | ON | | | 90 | 19.0 | | D BY | | | nnium | |
| | SINE | EK | A | GLU | onsulting | Engineers | 1 | | FLUSH | | | | Polymer G | el LO | GGE | D BY | | A. M | ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (mi | cing m) o ₅₀₀ | Legend | Non-infact zones (shaded) | | scription | | Depth (m) | Dis | continuit | ties | | Elevation | Standpipe Details | SPT (N Value) | |
| REi Har | | | | | | | | | HOLE D | | | | | | | | | | | |
| RE | MAR | KS | L | | | | 00 | | | INSTALL | ATION | REM | ARKS | To | | | | | | |
| Har | | | pecti | on pit | t to 1.2m. | | | | | Headwork | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | GROUND | WATE | R DET | TAILS | | | | | | | |
| | | | | | | | | | | Date | | ole epth | Casing Depth | Depth Wate | to | Comme | ents | | | |
| | | | | | | | | | | | 1 00 | .pui | PEHII | .,,,,, | | ır | | | | 1 |
| | TAL | LATI | | | | | | | | | | | | | | | | | | (|
| INS | | | | | - | | | T | | | 1 | | 1 | 1 | i | | | | | |
| INS | Date | | Tip D 13.0 | | RZ Top 6.00 | RZ Base 13.00 | | Type mm | | | | | | | | | | | | |



REPORT NUMBER

| 10 | | ノ | | | | | | | | | | | | | | | | - |
|--------------------|----------------------|---------|---------|---------|----------------|------------------------|-----------|---------------------------|-------------------|-------------------------|--------------|-----------|------------------|-------------------|------------------|-----------|-------------------|-------------------|
| СО | NTR | ACT | D | ublin | Central t | Developme | ent - Dra | aft - | | | | | - | DRIL SHEI | LHOLE N | Ю | RC(| 08 et 10 of 33 |
| СО | -ORE | OINA | TES(| _) | | | | - 1 | | LEVEL (m) VIETER (mm |) | 1 | 02 | DATI | STARTI COMPL | | 13/0 | 9/2008 9/2008 |
| | ENT | | | | | Developme Engineers | ents Ltd | . | NCLINATIO | ON | | | 90 Polymer Ge | | LED BY GED BY | | | nnium ahony |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Spa | | Legend | Non-intact zones (shaded) | | scription | | Depth (m) | Disc | continuitie | \$ | Elevation | Standpipe Details | SPT (N Value) |
| 9 | | | | | | | | | HOLE D Observe | | | | | | | | | |
| - | WAR | | nocti | n ni | to 1 2m | | | | | INSTALLA | | EM/ | ARKS | | | | | |
| mar | ia đu | ig ins | pection | on pit | to 1.2m. | | | | | Headworks | . | | | | | | | |
| | | | | | | | | | | GROUNDV | VATER | DET | AILS | | | | | |
| | | | | | | | | | | Date | Hole Dept | | Casing Depth | Depth to Water | Comm | nents | | |
| | | | | | | | | | | | | · J | VV | | | | | |
| | | | ON D | | | D7.0 | | T | | | | | | | | | | |
| 14 | <u>Date</u> -09-0 | 8(| 13.0 | 0 | RZ Top 6.00 | 13.00 | 50 | Type mm 9 | SP | | | | | | | | | |
| | -09-0 | | 32.5 | 0 | 26.50 | 32.50 | 50 | mm S | SP. | | | | | | | | | |



REPORT NUMBER

| | | DINA | TES(| | Central E | Developm | ent - Dra | (| GROUND LE | | n) | | 102 | DA ⁻ | EET FE S | TARTE | D | 13/09 | 98 at 11 of 33 9/2008 9/2008 | |
|--------------------|--|---------|---------|---------|--------------------|--------------------------------|-----------|---------------------------|--------------------|----------------------|-----------|-----------|-----------------|------------------|-------------|-------|-----------|-------------------|---------------------------------------|---|
| | ENT SINE | | | | Central E | | | | NCLINATION LUSH | N | | | 90 Polymer G | | | D BY | | | nnium ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (m) | cing m) 0 ₅₀₀ | Legend | Non-intact zones (shaded) | Desc | cription | | Depth (m) | Dis | continuiti | es | | Elevation | Standpipe Details | SPT (N Value) | |
| 110 | | | | | | | | | HOLE DR | by driller a gravel. | | | | | | | | | | (|
| | AARI | 7.0 | pectio | on pit | t to 1.2m. | | 1 01 | | | INSTALLA | | REM/ | ARKS | | | | | | | |
| | e de la companya de l | | | F" | | | | | L | Headworks | | | | | | | | | | |
| | | | | | | | | | - | GROUNDY | | | | Dorth. | to. | | | | | |
| | | | | | | | | | - | Date | Ho Der | | Casing Depth | Depth : Water | (O | Comm | ents | | | |
| NS. | TALI | _ATI | ON D | ЕΤΔ | ILS | | | _ | | | | | | | | | | | | |
| | Date | | | | | RZ Base | | Гуре | | | | | | | | | | | | |
| 14- | 09-0 | | 13.0 | 0 | 6.00 26.50 | 13.00 32.50 | 50r | nm S | SP | | 1 | | | | | | | | | |



REPORT NUMBER

| CC | NTR | ACT | | ublin | Central [| Developme | ent - Dra | aft | | | | | N2 2 | DRILL | HOLE N | 10 | RC |)8 |
|--------------------|---|---------|--------------|----------|-------------------|--------------------------------|---|---------------------------|--------------|---|--------|-----------|-------------------------|-------------------|-----------------|-----------|-------------------|------------------|
| | | 2121.2 | | | | - 57 | | 1 | SPOLIND I | LEVEL (m) | | | | SHEET | | | | et 12 of 33 |
| CC | -ORI | JINA | TES(| _) | | | | | | METER (mm |) | 1 | 102 | | STARTI COMPL | | | 9/2008 9/2008 |
| | IENT GINE | | | | | Developme Engineers | ents Ltd. | 7 | NCLINATIO | | , | - | 9 0 Polymer G | DRILL | ED BY | | Mille | nnium ahony |
| Downhole Depth (m) | | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (m | cing m) ⁰ 500 | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 14 | | | | | | | 000000000000000000000000000000000000000 | | SYMME HOLE D | TRIX OPEN PRILLING: ed by driller as of gravel. ed) TRIX OPEN PRILLING: ed by driller as of gravelly class of gravelly | 11 | .70 | | | | | | |
| - | MAR | | | | | | 11 | | | INSTALLA | TION R | EM/ | ARKS | | | | rair. | |
| Ha | nd du | g ins | pection | on pit | to 1.2m. | | | | | Headworks | | | | | | | | |
| | | | | | | | | | | GROUNDY | VATER | DET | AILS | | | | | |
| | | | | | | | | | | Date | Hole | | Casing | Depth to Water | Comm | nents | | |
| | | | | | | | | | | Date | Dept | 1 | Depth | Water | John | | | |
| INS | TAL | LATI | ON D | ETA | ILS | | | | | | | | | | | | | |
| | Date Tip Depth RZ Top RZ Base Type 14-09-08 13.00 6.00 13.00 50mm | | | | | | | | | | | | | | | | | |
| 14 14 | -09-0 -09-0 | 8 8 | 13.0 32.5 | i0 0 | 6.00 26.50 | 13.00 32.50 | | nm S nm S | | | | | | ľ | | | | |



REPORT NUMBER

| CO | NTR | ACT | C | ublin | Central E | Developme | ent - Dra | aft | | | | | | 27.00 | | IOLE N | 0 | RC | | (|
|--------------------|--------------------|---------|---------|---------|---------------------|-----------------------|-----------|---------------------------|------------------|--|----|-----------|-----------------|-------------|------|--------|-----------|-------------------|---------------------------------|---|
| cc | -ORI | DINA | TES(| _) | | | | | | LEVEL (m) METER (mr | n) | | 102 | D | | STARTI | | 13/0 | et 13 of 33 9/2008 9/2008 | |
| | IENT GINE | | | | Central D | evelopme Engineers | ents Ltd | . | NCLINATI LUSH | ON | | | 90 Polymer G | | | D BY | | | nnium ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spac (mi | ture cing m) | Legend | Non-intact zones (shaded) | | scription | | Depth (m) | | continu | | | Elevation | Standpipe Details | SPT (N Value) | |
| 12 RE Hai | | | | | | | | | HOLE D | TRIX OPEN PRILLING: ad by driller a of gravelly cl ed) | as | | | | | | | | | |
| RE | MAR | | necti | on ni | t to 1.2m. | | | | | INSTALL | | REM | ARKS | | | | | THIL | | |
| 500 | iu uu | 9 1115 | PCOI | on pi | . 10 1.2111. | | | | | Headwork | | | | | | | | | | |
| | | | | | | | | | | GROUND | | R DET | Casing | Dant | h to | | | | | |
| | | | | | | | | | | Date | | epth | Depth | Dept Wat | er | Comm | ents | | | |
| INS | | LATI | | | | D7 Desc | | Trees | | | | | | | | | | | | (|
| 14 | -09-0 | 8 | 13.0 | 10 | 6.00 | RZ Base 13.00 | 50 | Type mm S | SP | | | | | | | | | | | |
| 14 | -09-0 |)8 | 32.5 | 0 | 26.50 | 32.50 | 50 | mm S | SP | | 1 | | | | | L | | | | |



REPORT NUMBER

| CO | NTR | ACT | D | ublin | Central De | velopme | nt - Dra | nft | | | | | | DRILLI | HOLE N | 0 | RC0 | 8 |
|--------------------|--------------------|---------|--------------|---------|-----------------------------|----------------|----------|---------------------------|-------------------|------------------------|--------------|-------------|------------------|-------------------|--------|-----------|-------------------|----------------|
| | | | | | - Commun Bo | Tolopine | | _ | | | | | | SHEET | | | | t 14 of 33 |
| СО | -ORE | OINA' | FES(| _) | | | | | | .EVEL (m) METER (mm |) | 1 | 02 | | STARTE | | | /2008 /2008 |
| | IENT GINE | | | | Central De- onsulting En | | nts Ltd | ' | NCLINATION | ON | | | 90 Polymer Ge | DRILLE LOGGI | | | Miller A. Ma | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fractu Spacir (mm) | ng) 500 | Legend | Non-intact zones (shaded) | | scription | | Depth (m) | Disc | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 13 | | | | | | | | | HOLE D Observe | | s s y, | | | | | | | |
| | MAR | | nectio | n nit | to 1.2m. | | | | | INSTALLA | | REM/ | ARKS | | | | | |
| ''' | ių uu | சி யத | PUTUII | ווט זוכ | Q 1.ZIII. | | | | | Headworks | 3. | | | | | | | <u> </u> |
| | | | | | | | | | | GROUND | | | | | , | | | |
| | | | | | | | | | , | Date | H De | ole epth | Casing Depth | Depth to Water | Comm | ents | | |
| <u> </u> | | | | | | | | | | | | | | | | | | |
| | TAL Date | | | | RZ Top R | 7 Pass | | Туре | | | | | | | | | | |
| 14 | -09-0 -09-0 | 8 | 13.0 32.5 | 0 | 6.00 | 13.00 32.50 | 50 | mm S mm S | 3P | | | | | | | | | |



REPORT NUMBER

| COI | NTR | ACT | C | ublin | Central [| Developm | ent - Dr | aft | | | | | DRI SHI | LLHOLE N | Ю | RCC | 18 t 15 of 33 | (|
|--------------------|--------------------|---------|---------|-------------|-------------------|------------------------|----------|---------------------------|------------------|---|---------------|-----------------|------------------|--------------------|-----------|-------------------|------------------|---|
| CO | ORI | OINA. | TES(| _) | | | | | | LEVEL (m) | | | DA. | TE START | | 13/09 |)/2008 | |
| | | | | | | | | _ | | METER (mn | 1) | 102 | DA. | TE COMPL | ETED | 14/09 | 0/2008 | |
| | ENT SINE | | | | Central E | | | . | NCLINATI LUSH | ON | | -90 Polymer | | LLED BY GGED BY | | Miller A. Ma | nnium | |
| | 1 | | | | Jonathing | Liigiileers | | | LUSH | _ | | Folymer | Jei LO | JGED DT | | A. IVE | anony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (m | m) 0 ₅₀₀ | Legend | Non-intact zones (shaded) | | scription | Depth (m) | D | iscontinuiti | es | Elevation | Standpipe Details | SPT (N Value) | |
| 14 | | | | | | | | | HOLE D | TRIX OPEN PRILLING: d by driller a f gravelly cl ed) | s | | | | | | | |
| _ | IAR | | | | | | 1 | | | INSTALLA | TION RE | MARKS | | | | K//) N | | |
| Han | d du | g insp | pectio | on pit | to 1.2m. | | | | | Headworks | 3 . | | | | | | | |
| | | | | | | | | | | GROUND | VATER D | ETAILS | | | | | | |
| | | | | | | | | | | Date | Hole Depth | Casing Depth | Depth 1 Water | Comm | ents | | | |
| | | | | | | | | | | | | Doput | 2 4 000001 | | | | | 1 |
| | ΓΔΙΙ | ΔΤΙ | ט אכ | FTA | II S | | | | | | | | | | | | | |
| | TALL Date | | | ETA epth | | RZ Base | | Туре | | | | | | | | | | (|



REPORT NUMBER

| 1 | (S) (S) | | | | | | | | | | | | | | | İ | | 000 |
|--------------------|------------------|---------|---------|---------|-------------------|------------------|-----------|---------------------------|-----------|---|----------|-----------|-----------|-------------------|--------|-----------|-------------------|----------------------|
| CC | NTR | ACT | D | ublin | Central E | Developme | ent - Dra | aft | | | | | | 1 | HOLE N | o | RCC | |
| cc |)-ORE | DINA. | TES | _) | | | | Ţ | GROUND I | LEVEL (m) | | | | SHEE DATE | STARTE | | | t 16 of 33 9/2008 |
| | | | | | | | | | | METER (mm |) | 1 | 02 | | COMPLI | | | 9/2008 |
| | JENT | | | | | Developme | ents Ltd | .] | NCLINATIO | ON | | | 90 | 1 | ED BY | | | nnium |
| \vdash | GINE | EK | A | GLC | onsulting | Engineers | | | LUSH | | | | Polymer G | el LOGG | ED BA | | A. Ma | ahony |
| Downhole Depth (m) | | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (m | cing m) | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 15 | 15.00 | | | | | | | | HOLE C | TRIX OPEN PRILLING: ad by driller a of gravelly cla ed) | s ay. | 16.00 | | | | | | |
| RE | MAR | | | | l | | _ | | | INSTALLA | | | ARKS | | | | R//3 R | |
| На | nd du | g ins | pecti | on pit | to 1.2m. | | | | | Headworks | 5. | | | | | | | |
| | | | | | | | | | | GROUNDV | VATER | DET | AILS | | | | | |
| | | | | | | | | | | Date | Но | le | Casing | Depth to Water | Comm | ents | | - |
| | | | | | | | | | | | Der | om | Depth | vvalei | | | <u> </u> | |
| INS | STAL | | | | | | | | | <u> </u> | 1 | | | | | | | |
| 14 | Date I-09-0 | | 13.0 | | RZ Top 6.00 | RZ Base 13.00 | | Type mm | | | | | | | | | | |
| 12 | 1-09-0 1-09-0 | 8 | 32.5 | io | 26.50 | 32.50 | 50 | mm: | SP | | | | | | | | | |



REPORT NUMBER

| | ORE | ACT DINA | _ | | Central Developme | ent - Dra | (| | LEVEL (m) | | | SHEE | STARTE | ĒD | 13/09 | et 17 of 33 9/2008 | 1 |
|--------------------|--------------------------------------|-------------|---------|-----------|---|-----------|---------------------------|---------------------|---|-----------|------------|-------------------|----------------|-----------|--|--|---|
| CLII | ENT | | | ublin | Central Developme | ents Ltd | ⊢ | ORE DIA | METER (mm) ON | | 102 -90 | - | COMPL ED BY | ETED | | 9/2008 nnium | _ |
| | SINE | | | | onsulting Engineers | | | LUSH | | | Polymer G | | ED BY | | | ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R,Q.D.% | Fracture Spacing (mm) 0 250 500 | Legend | Non-intact zones (shaded) | De | scription | Depth (m) | Dis | scontinuities | , | Elevation | Standpipe Details | SPT (N Value) | |
| 16 | 16.00 | 100 | 0 | 0 | | | | gravelly predomi | wn sandy CLAY (gravel nantly fine, to sub-rounde | is d) | | | | | <u>VII VII VII VII VII VII VII VII VII VII</u> | N = 100/80 mm (10, 15, 30 60, 10) | |
| _ | MARI | | nectic | on nit | to 1.2m. | | | | INSTALLAT | ION REM | IARKS | | | | | | _ |
| ilaii | u uu | y ii is | Jecui | on più | 10 1.211. | | | | Headworks. | | | | | | | | _ |
| | | | | | | | | | GROUNDW | Hole | Casing | Depth to | Corre | onte | | | _ |
| | | | | | | | | | Date | Depth | Depth | Depth to Water | Comm | ents | | | |
| 14- | ΓALL Date 09-0- 09-0 | 8 | | epth 0 | RZ Top RZ Base 6.00 13.00 26.50 32.50 | 50 | Type mm S | SP | | | | | | | | | (|



REPORT NUMBER

| | _ | | | | | | | | | | | | | | | | | | |
|----------------------|--------------------|---------|--------------|-----------|----------------------|--|---------|------------|---------------------------|--------------------------------|---|------------|-----------|----------|-------------------|----------------|-----------|-------------------|---------------------------------|
| СО | NTR | ACT | С | ublin | Central | Develor | ome | nt - Dra | aft | | | | | | DRILL SHEE | HOLE N | 0 | RC(| D8 et 18 of 33 |
| СО | -ORI | OINA | TES(| _) | | | | | | | LEVEL (m) METER (mm | .) | 4 | 102 | DATE | STARTE | | 13/0 | 9/2008 9/2008 |
| <u></u> | ENT | | | -: الطورة | Control | Davisti | · · · · | nda I ari | | NCLINATION | - | '' | | 90 | | | _, _U | - | |
| | ENT GINE | | | | Central onsulting | | | nts Ltd. | . | LUSH | | | | olymer G | | ED BY ED BY | | | nnium ahony |
| □ Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Spa (n | cture acing nm) ⁵⁰ 500 |) ⊔ | Legend | Non-intact zones (shaded) | De | escription | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| | | 100 | 0 | 0 | | | | | | gravelly predomi angular | wn sandy CLAY (grave inantly fine, to sub-round illy rounded) | led | 17.05 | | | | | | N = 55/31 mm (25, 45, 55) |
| | MAR | | | | | | | | | | INSTALLA | TION | REM/ | ARKS | | | | .132.2313 | · |
| Han | ıd du | g ins | pection | on pit | to 1,2m | | | | | | Headworks | S . | | | | | | | |
| | | | | | | | | | | | GROUNDY | VATE | R DET | AILS | | | | | |
| | | | | | | | | | | | Date | Н | lole | Casing | Depth to Water | Comm | ents | | |
| | | | | | | | | | _ | | | ı De | epth | Depth | vvater | | | | |
| INS | TALI | LATI | | | | | | | | | | | | | | | | | |
| | Date | | Tip D | epth | RZ Top | | | | Type | | | | | | | | | | |
| 14- 14- | -09-0 -09-0 | 8 | 13.0 32.5 | 0 | 6.00 26.50 | 13.00 32.50 | 0 | 50: 50: | mm S mm S | 5P SP | | | | | | | | | |



REPORT NUMBER

| COM | ITR/ | CT | D | ublin | Central D | evelopme | ent - Dra | aft | | | | | | 0.0000011000 | HOLE N | 0 | RC0 | | (|
|------|--------------------|--------------------|---------|---------|---------------------|---------------------|-----------|---------------------------|--------------------------------|--|--------|-----------|------------|-------------------|--------|-----------|--|----------------------------|---|
| | | | | | | | | T | | | | | | SHEE | т | | Shee | t 19 of 33 | |
| 204 | ORD | INA. | TES(| _) | | | | | | .EVEL (m) | | | | | STARTE | | | /2008 | |
| | | | | | | | | _ | | METER (mm | 1) | | 102 | DATE | COMPL | ETED | 14/09 | /2008 | |
| CLIE | | | | | Central D | | ents Ltd | | NCLINATIO | N | | | 90 | | ED BY | | Miller | | |
| ENG | INE | ER | Α | GL C | onsulting i | engineers | | F | LUSH | | | F | Polymer Ge | LOGG | ED BY | | A. Ma | lhony | |
| | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spac (mi | cing m) O 500 | Legend | Non-intact zones (shaded) | | scription | | Depth (m) | Disc | ontinuities | | Elevation | Standpipe Details | SPT (N Value) | |
| | 8.50 | 100 | 0 | 0 | | | | | gravelly predomi angular | wn sandy CLAY (grave nantly fine, to sub-round lly rounded) ed) | | | | | | | SURVINSULSALISALISALISALISALISALISALISALISALISAL | N = 50/2 mm (25, 50, | |
| | | | | | | | | | * | INSTALLA | TION F | REM/ | ARKS | | | | 10,7710 | | |
| | AR | | | | t to 1.2m. | | | | | Headworks | 3. | | | | | | | | |
| | | | pectio | on pit | (0 1.2111. | | | | | | | | | | | | | | |
| | | | pectio | on pit | 1.2111. | | | | | 48 | VATER | DET | TAILS | | | | | | |
| | | | pection | on pit | 1.211. | | | | i i | GROUND\ Date | Hol | le | Casing | Depth to | Comm | ents | | | _ |
| and | dug | g ins _l | | | | | | | , | GROUND | , | le | | Depth to Water | Comm | ents | | | |
| IST | dug | j ins | ם אכ |)ETA | IILS | RZ Base | | Туре | | GROUND | Hol | le | Casing | Depth to Water | Comm | ents | | | |



REPORT NUMBER

| | | | | | | | | | | | | | | | | 1 | | | |
|--------------------|--------------------|------------------|---------|---------|----------------|------------------------|-----------------------|---------------------------|--|----------------------------|---------------|-----------|------------------|-------------------|------------------|-----------|-------------------|-------------------------|----|
| co | NTR | ACT | D | ublin | Central | Developme | ent - Dra | aft | | | | | | DRIL SHEE | LHOLE N | 0 | RC(| 08 et 20 of 3 | 22 |
| СО | -ORI | DINA: | TES(| _) | | | | | | LEVEL (m) METER (mm |) | 1 | 102 | DATE | STARTE COMPL | | 13/0 | 9/2008 9/2008 | |
| | ENT GINE | | | | | Developme Engineers | ents Ltd | . | ICLINATION LUSH | ON | | | 90 Polymer Ge | | LED BY GED BY | | | nnium ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Spa (m | cture acing am) | Legend | Non-intact zones (shaded) | | escription | : | Deptn (m) | Disc | continuitie | 3 | Elevation | Standpipe Details | SPT (N Value) | |
| 19 | 19.90 | 100 | 0 | 0 | | | | | gravelly predomi angular and loca (continu | 9.4-19.6) to s own SILT | 19 | .40 | | | | | | | |
| | | 100 | 0 | 0 | | | - - - - - | | green br | htiy gravelly rown CLAY | | .00 | | | | | | | |
| | MARI | | hentin | n nit | to 1.2m. | | | | | INSTALLA | | EM/ | ARKS | | | | | | |
| ı nar | iu uu | y 111 5] | Jeul | ai bit | . to 1.2111. | | | | | Headworks | | | | | | | | | |
| | | | | | | | | | | GROUNDV | | | | | | | | <u> </u> | |
| | | | | | | | | | | Date | Hole Depth | | Casing Depth | Depth to Water | Comm | ents | | | |
| | | | | | | | | | | | | | , | | | | | | |
| | | LATIC | | | | 070 | | т | | | | | | | | | | | |
| | Date -09-0 | | 13.0 | | RZ Top 6.00 | RZ Base 13.00 | | Type nm S | iP . | | | | | | | | | | |
| | .09-0 | | 32.5 | ŏΙ | 26.50 | 32.50 | 50 | nm S | P | | | | | | | | | | |



REPORT NUMBER

| CLIENT Dublin Central Developments Ltd. ENGINEER AGL Consulting Engineers Fracture Spacing (mm) Output Description Fracture Spacing (mm) Output | |
|---|---|
| Fracture Spacing (mm) 20 20 00 0 | ahony (anie) (b) (anie) (b) (c) (d) (e) (d) (e) (e) (e) (e) (e |
| Mottled brown black clayey, very gravelly SAND (medium grained) with local cobbles. Gravel is predominantly coarse and rounded to sub-angular. | N = 39/30 |
| clayey, very gravelly SAND (medium grained) with local cobbles. Gravel is predominantly coarse and rounded to sub-angular. | |
| 100 31 26 20.80 Discontinuities are smooth and planar and clay smeared. Dips are sub-10°. | (25, 61, 39) |
| REMARKS INSTALLATION REMARKS Hand dug inspection pit to 1.2m. Headworks. | |
| GROUNDWATER DETAILS | |
| Date Hole Casing Depth to Comments | |
| NSTALLATION DETAILS | (|
| Date Tip Depth RZ Top RZ Base Type 14-09-08 13.00 6.00 13.00 50mm SP 14-09-08 32.50 26.50 32.50 50mm SP | |



REPORT NUMBER

| | | CT | | | Ochildr D | evelopn | ient - Dia | | | | | | SHEE | HOLE NO | | RC0 | 22 of 33 |
|--------------------|---------------------|---------|-------------------------|---------|----------------------|-------------------|------------|---------------------------|--|--|-----------|--|---|-----------------------------|-----------|-------------------|---------------|
| O-C | RD | INA. | TES(| _) | | | | | | LEVEL (m) METER (mm) | , | 102 | | STARTE! | | 13/09/ 14/09/ | |
| LIE | | ER. | | | Central D | • | | ' | NCLINATIO | ON | | 90 Polymer Ge | | ED BY | | Millen A. Ma | |
| Downnoie Depth (m) | Core Kun Deptin (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fract Spac (mr | cing n) 500 | Legend | Non-intact zones (shaded) | De | scription | Depth (m) | | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 21 | .50 | | | | | | | | strong, t bedded, black, fir ARGILL LIMEST slightly a moderat Pyrite di | out. Local eining. | 21.87 | and plan | nuities are s ar and clay I. Dips are (continued | | | | |
| | | | | | | | | | moderat bedded t black, ca SHALE. | ely strong to ely weak, thinly to laminated, alcareous Fresh to und locally | 2 | and plan smeared are sub- and insig | nuities are s ar, and clay throughou 10° with ha pient clay sr throughou | t. Dips irline neared | | | |
| EM/ land | | | pectic | n pit | to 1.2m. | | | | | INSTALLATI Headworks. | ON REMA | ARKS | | | | | |
| | | | inspection pit to 1.2m. | | | | | | | GROUNDWA | TER DET | AILS | | | | | |
| | | | | | | | | | | Date | Hole | Casing | Depth to Water | Comme | nts | | |
| | | | | | | | | | | | Depth | Depth | vvater | | | | |
| | | A T1/ | N D | CTAI | ı e | | | | | | | | | 1 | | | |
| IST/ | ALL ite | | | | | RZ Base | 1 . | Туре | | | | | | | | | |



REPORT NUMBER

| CONTR | | | | Central Developme | ent - Dra | _ | GROUND LEVEL (m) | | | SHEE | HOLE N T STARTI | | Sheet 13/09 | 23 of 33 | . (|
|--|---------|---------|---------|--|-----------|---------------------------|--|-----------|---|--|----------------------------------|-----------|--|---------------|-----|
| | | | | | | _ | ORE DIAMETER (mr | n) | 102 | DATE | COMPL | ETED | 14/09 | /2008 | |
| CLIENT ENGINE | | | | Central Developme onsulting Engineers | nts Ltd. | | LUSH | | -90 Polymer G | | ED BY | | Millen A. Ma | | |
| Downhole Depth (m) Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) 0 250 500 | Legend | Non-intact zones (shaded) | Description | Depth (m) | Dis | scontinuities | | Elevation | Standpipe Details | SPT (N Value) | |
| 22.80 | 100 | 0 | 0 | | | | moderately weathern Pyrite dispersed. Incipient fractures common. Moderately strong to moderately weak, the bedded to laminated black, calcareous SHALE. Fresh to slightly and locally moderately weathern Pyrite dispersed. Incipient fractures common. (continued) | inly , | and plan smeare are sub and insi | inuities are s nar, and clay d throughou -10° with ha pient clay sr s throughou ned) | / t. Dips irline neared | | <u>KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK</u> | | (|
| | 100 | 0 | 0 | | | | | | | | | | | | |
| REMAR | | neofi | nn nit | to 1.2m. | | | - | ATION REI | MARKS | | | - | | | |
| ianu ul | 19 IIIS | herm | on pil | IO I.ZIII. | | | Headwork | | | | | | | | |
| | | | | | | | - | WATER DI | Casing | Denth to | | | | | _ |
| | | | | | | | Date | Depth | Depth | Depth to Water | Comm | ents | | | - 0 |
| NSTAL Date 14-09-0 | | | epth | RZ Top RZ Base 6.00 13.00 | | Type | | | | | | | | | (|



REPORT NUMBER

| 10 | ගුම | y | | | | | | | | | | | | | | 10 | 030 |
|--------------------|--------------------|----------|---------|-------------|----------------------|-------------------|-----------|---------------------------|--|-------------------------|---------------|---|--|--------------------------|-----------|-------------------|--------------------------------|
| CO | NTR | ACT | ם | ublin | Central D | evelopme | ent - Dra | aft | | | | | DRILL | HOLE N | 0 | RC | 8 |
| co | -ORE | ANIC | TES(| _) | | | | | | LEVEL (m) METER (mm) | | 102 | | T STARTE COMPL | | 13/09 | t 24 of 33 0/2008 0/2008 |
| | ENT | FR | | | Central Do | | ents Ltd | . 11 | ORE DIAI NCLINATIO 'LUSH | | | -90 Polymer G | DRILL | ED BY | EIED | | nnium |
| | | | | | Orisanting L | ingineers. | | | LUSH | | T . | Polymer G | ei LOGG | ED B1 | | A. IVIC | arioriy |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fract Spac (mn | sing n) 500 | Legend | Non-intact zones (shaded) | De | scription | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 23 | 23.10 | 100 | 57 | 50 | | 5 | | | strong to thin to m grey to c grained LIMEST slightly a moderate pyrite di locipient common strong to the strong to the strong to the strong to c grained LIMEST slightly a moderate pyrite di | out. Local | 23.46 | and plar smeared are suband injury fractures (continu | nuities are s iar. Dips ar with local si | t. Dips inline neared t. | | | |
| | | | | | | | H | | | | | | | | | | |
| | /IARI | | | - · | 4- 4-2 | | | | | INSTALLAT | ION REM | ARKS | | | | | |
| ar | ia du | y ins | Jecti(| on pit | to 1.2m. | | | | | Headworks. | | | | | | | |
| | | | | | | | | | | GROUNDWA | ATER DE | | | | | | |
| | | | | | | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comm | ents | | |
| | | | | | | | | | | | m win m | | | _ | | | |
| | T A, • | 47** | | CT * * | | | | | | | 2.461. | | | | | | |
| - | TALI | | | ETAI | | RZ Base | | Туре | | | | | | | | | |



REPORT NUMBER

| COI | NTR/ | ACT | | ublin | Central Developme | ent - Dra | _ | | | | | SHE | LHOLE N | | RC08 Sheet | 8 25 of 33 | - 1 |
|--------------------|----------------------|---------|--------------|---------|---|-------------|---------------------------|--|---|---------------|---|---|--|-----------|---|----------------------|-----|
| :0- | ORE |)INA | TES(| _) | | | | | LEVEL (m) METER (mm) | 1 | 102 | | E START | | 13/09/ 14/09/ | | |
| | ENT SINE | ER | | | Central Developme | ents Ltd | | NCLINATIO | ОМ | | 90 Polymer Ge | | LED BY | | Millen A. Ma | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) 0 ²⁵⁰ 500 | Legend | Non-intact zones (shaded) | De | scription | Depth (m) | Disc | continuitie | es | Elevation | Standpipe Details | SPT (N Value) | |
| 24 | | | | | | | | thin to m grey to d grained t LIMEST slightly a moderate Pyrite dis | out. Local eining. | | and plan | | are | | | | (|
| | 24.60 | | | | | | | moderat bedded to black, ca SHALE, slightly a moderat Pyrite dis Incipient commor Strong to strong, ti | t fractures moderately hin to medium | 24.49 | and plan smeared sub-10° fractures Discontin and plan smeared | nuities are ar and cla d. Dips ar with sub | cally clay e ne e smooth ay e | | | | |
| | 24.80 | 100 | 0 | 0 | | | | black, fir ARGILL LIMEST slightly a moderat Pyrite dis througho calcite ve | out. Local eining. | 24.80 | Pinconti | | o creath | | 1840 1840 1840 1840 1840 1840 1840 1840 | | |
| | 4.00 | | | | | | | moderat bedded i black, ca SHALE. slightly a moderat Pyrite dia | ely strong to ely weak, thinly to laminated, alcareous Fresh to and locally ely weathered. spersed. i fractures | | and plan | nuities are ar and cla I. Dips ar | ау | | SKIII KSKIII KSKIII KSKIII | | |
| | //ARI | | pectio | on pit | to 1.2m. | | | | INSTALLATION Headworks. | ON REM | ARKS | 245 | | | | | |
| | | | | | | | | | GROUNDWA | TER DET | AILS | | | | | | _ |
| | | | | | | | | | Date | Hole Depth | Casing Depth | Depth t Water | O Comm | nents | | | |
| | | | | ETA | | 1 | Tuno | | | | - | | | | | | |
| 14- | Date 09-0 09-0 | 8 | 13.0 32.5 | 0 | RZ Top RZ Base 6.00 13.00 26.50 32.50 | 50 | Type mm S mm S | SP. | | | | | | | | | |



REPORT NUMBER

| 10 | 68 | | | | • | 3EO I E | -01111 | | AL COI | KE LUG | KEU | UN | U | | | | 13 | 696 |
|--------------------|--------------------|---------|--------------|---------|---------------------|------------------------------|-----------|---------------------------|--|---|--------------|-----------|---------------------|--|--------|-----------|-------------------|-------------------|
| CC | NTR | ACT | D | ublin | Central E | Developme | ent - Dra | aft | | | | | _ | DRILL | HOLE N | 0 | RC0 Shee |)8 et 26 of 33 |
| CC | -ORI | OINA | ΓES(| _) | | | | 1 | GROUND I | _EVEL (m) | | | | DATE | STARTE | ED. | | 9/2008 |
| | | | | | | | _ | (| CORE DIA | VIETER (mm |) | 1 | 02 | DATE | COMPL | ETED | 14/09 | 9/2008 |
| CL | ENT | | | | |)evelopme | ents Ltd | . 1 | NCLINATIO | ON | | - | 90 | DRILL | ED BY | | Miller | nnium |
| | GINE | ER | Α | GL C | onsulting t | Engineers | | | FLUSH | | | F | Polymer Ge | LOGG | ED BY | | A. Ma | ahony |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spac (mi | cing m) ₅₀₀ | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Disc | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 25 | | | | | | | | | moderati bedded black, ca SHALE. slightly a moderati Pyrite dia Incipient | ely strong to ely weak, thin to laminated, alcareous Fresh to and locally ely weathere spersed. fractures in (continued) | d. | 5.21 | and plan smeared | nuities are : ar and clay . Dips are (continued | | | | |
| | | | | | | | | | strong, t bedded, black, fir ARGILL LIMEST slightly a moderat Pyrite di | out. Local | m to | J.Z.1 | and plan | nuities are s ar and clay . Dips are | | | | |
| | | 100 | 75 | 45 | l | | | | | | | | | | | | | |
| | | | | | | | | | thin to m grey to d grained LIMEST slightly a moderat Pyrite di | out. Local | ed, e | 5.72 | and plan | nuities are : ar and clay , Dips are | | | | |
| RE | MAR | KS | | | | | | | | INSTALLA | TION R | tEM/ | ARKS | | | | K/A K | |
| _ | | | pecti | on pi | t to 1.2m. | | | | | Headworks | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | GROUNDY | | | | | т | | | |
| | | | | | | | | | | Date | Hole Dept | | Casing Depth | Depth to Water | Comm | ents | | |
| | | | | | | | | | | | | | | | | | | |
| NS | | LATI | | | | | | | | | | | | | | | | |
| 1.4 | Date -09-0 | | | | RZ Top | RZ Base 13.00 | | Type mm | _ | | | | | | | | | |
| | -09-(-09-(| | 13.0 32.5 | | 6.00 26.50 | 32.50 | | mm | | | | | | | | | | |



REPORT NUMBER

| CON | NTR/ | ACT | C | ublin | Central Developme | ent - Dra | aft | | | | DRILL SHEE | HOLE N | 0 | RC0 Sheet | 8 : 27 of 33 | (|
|--------------------|--------------------|---------|--------------|---------|--|-----------|---------------------------|--|---------------|---|------------------------------------|-----------------|-----------|--|-----------------|---|
| co- | ORE | OINA. | TES(| _) | | | | GROUND LEVEL (m) CORE DIAMETER (mm) | | 102 | | STARTE COMPL | | 13/09 14/09 | | |
| | ENT | ER | | | Central Developme onsulting Engineers | ents Ltd | . | NCLINATION LUSH | | 90 Polymer Gel | | ED BY ED BY | | Millen A. Ma | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) 0 250 500 | Legend | Non-intact zones (shaded) | Description | Depth (m) | Discon | tinuities | | Elevation | Standpipe Details | SPT (N Value) | |
| 26 | | | | | | | | | | Discontinuit and planar a smeared. I sub-10°. (co | and clay Dips are | | | | | |
| 2 | £6.30 | | | | | | | Moderately strong to moderately weak, thinly bedded to laminated, black, calcareous SHALE. Fresh to slightly and locally moderately weathered. Pyrite dispersed. Incipient fractures common. | 26.11 | Discontinuit to slightly ro planar. Dip | ugh and | | | I KALI KALI KALI KALI KALI KALI KALI KAL | | |
| | | 100 | 30 | 0 | | | | Strong to moderately strong, thin to medium bedded, dark grey to black, fine grained ARGILLACEOUS LIMESTONE. Fresh to slightly and locally moderately weathered. Pyrite dispersed throughout. Local calcite veining. | | Discontinuit and planar a smeared. I sub-10° with stained sub- fracture. | and sligh Dips are n iron ox | tly clay | | | | |
| 2 | e6.60° | | | | | | | | | | | | | | | (|
| REM | IAR | κs | | | | | | INSTALLATIO | N REM | ARKS | | | | | | |
| | | | pectio | on pit | to 1.2m. | | | Headworks. | | | | | | | | _ |
| | | | | | | | | GROUNDWAT | | | | | | | | _ |
| | | | | | | | | | Hole Depth | Casing D Depth | epth to Water | Comm | ents | | | _ |
| | ALL Date | | ON D | ETA | LS RZ Top RZ Base | | Туре | | | | | | | | | (|
| 14-(| 09-0 09-0 | 8 | 13.0 32.5 | 0 | 6.00 13.00 26.50 32.50 | 50 | mm S | SP | | | | | | | | |



REPORT NUMBER

| | CT | | ublin | Central Developme | ent - Dra | aft | | | | | DRILL SHEET | HOLE NO | 0 | RC0 Sheet | 8 : 28 of 33 |
|------------------|---------|---------|--------|--|-----------|---------------------------|---|---|-----------|---|--------------------------------------|---------|-----------|--------------------|------------------------|
| CO-ORDIN | NAT | | | 20 | | _ c | | IETER (mm) | | 102 | DATE | STARTE | | 13/09 14/09 | /2008 |
| LIENT NGINEER | ₹ | | | Central Developme onsulting Engineers | ents Ltd | | NCLINATIO LUSH | N | | 90 Polymer Gel | DRILL LOGG | | | Millen A. Ma | |
| | T.C.R.% | S.C.R.% | | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | Des | cription | Depth (m) | Disc | ontinuities | | Elevation | Standpipe Details | SPT (N Value) |
| 27 | 000 | 61 | 7 | | | | strong, th bedded, c black, fine ARGILLA LIMESTC slightly ar moderate Pyrite dis throughor calcite ve (continue) Moderate moderate bedded to black, cal SHALE, slightly ar | NOÉOUS ONE. Fresh to not locally ly weathered. persed lut. Local ining. ely strong to ly weak, thinly o laminated, careous Fresh to not locally ly weathered. persed. fractures | 27.52 | and plana smeared. sub-10° w stained su fracture. (| uith iron oxind-vertical icontinued) | de | | | |
| REMARKS | | antin | us mit | to 1 2m | | | | INSTALLATIO | N REM | ARKS | | | | I: . <u>II</u> : I | |
| land dug | ınsp | ectic | on pit | το 1.2 m . | | | | Headworks. | | | | | | | |
| | | | | | | | - | GROUNDWAT | ER DET | Casing | Depth to | 0 | | | |
| | | | | | | | | | epth | Depth | Depth to Water | Comm | ents | | |
| | ATIC | N D | ETAI | LS | | | | | | | | | | | |
| NSTALLA Date | | p De | | RZ Top RZ Base | | Туре | | | | | | | | | |



REPORT NUMBER

| CO-OF | RDIN. | ATE | S(_) | | | | | | LEVEL (m) METER (mm |) | 1 | 102 | | STARTE | | 13/09 | | |
|--|-------|-------------|---------|-------|--|---------|---------------------------|---|--|----|-----------|---------------------------------|--|--------|-----------|-------------------|---------------|---|
| CLIEN | | _ | | | entral Developmer sulting Engineers | nts Ltd | - | NCLINATION LUSH | ON | | | 90 Polymer Ge | | ED BY | | Millen A. Ma | | |
| Downhole Depth (m) Core Run Depth (m) | | % a U | % C C R | 0 11 | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | De | escription | | Depth (m) | Disa | continuities | | Elevation | Standpipe Details | SPT (N Value) | |
| 28.4 | 100 | | | | 760 | | | moderate bedded black, car SHALE. slightly a moderate Pyrite di Incipient common strong to | tely strong to tely weak, thi to laminated, alcareous Fresh to and locally tely weathere spersed. It fractures in a continued to very strong ledium bedding silliceous ONE. Fresh and locally lely weathere spersed out. | d. | 28.42 | and plan smeared sub-10°. | nuities are ar and clay . Dips are (continued | smooth | | | | |
| REMAR | | spec | tion r | it to | 1.2m. | | | | INSTALLA | | REMA | ARKS | | *** | | | | _ |
| | J "' | ٠٠٠٠ | þ | | | | | | Headworks | | | | | | | | | |
| | | | | | | | | 9 | GROUNDV | Н | ole | Casing | Depth to | Comm | onte | | | _ |
| NSTAI Dat 14-09- | | | | | S Z Top RZ Base | | Туре | | Date | De | pth_ | _Depth | Depth to Water | Comm | enis | | | (|



REPORT NUMBER

| ONT | TRA | CT | D | ublin | Central Developme | ent - Dra | ıft | | | | | DRILL SHEET | HOLE NO | 0 | RC0 Sheet | 8 t 30 of 33 |
|----------------|--------------------|---------|---------|-----------|---|-----------|---------------------------|--|--|--------------|---------------------------------|---|------------------|-----------|-------------------|------------------------|
| :0-0 | RD | INA | TES(| _) | | | c | ROUND LEVEL (ORE DIAMETER | | | 02 | | STARTE COMPLI | | | 9/2008 9/2008 |
| LIE | | ER | | | Central Developme onsulting Engineers | ents Ltd | | NCLINATION LUSH | | | 90 Polymer Ge | 1 | ED BY ED BY | | Miller A. Ma | |
| Downhole Depth | Core Kun Deptn (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | Description | า | Depth (m) | | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 29 | | | | | | | | | | 29.17 | and plan | nuities are s ar. Dips are (continued) | е | | | |
| | | | | | | | | Moderately stroi moderately wea bedded to lamin black, calcareou SHALE. Fresh slightly and loca | ık, thinly ated, ıs to | 29.28 | and plan smeared sub-10°. | | | | | |
| | | | | | | | | moderately wea Pyrite dispersed Incipient fracturi common. Strong to very s thin to medium I grey to dark gre grained SILICEC | thered. l. es trong, bedded, y, fine OUS | 29.46 | and plan | nuities are s ar and clay I. Dips are | mooth | | | |
| 29 | .50 | | | | | | | LIMESTONE. If slightly and loca moderately wea Pyrite dispersed throughout. Strong to moder strong, thin to m bedded, dark gri black, fine grain | thered. rately nedium ey to | 23.40 | to slightly | nuities are s y rough and l. Non-intad | clay | | | |
| | | | | | | | | ARGILLACEOU LIMESTONE. F slightly and loca moderately wea Pyrite dispersed throughout. | IS Fresh to Illy thered. | 20.70 | and sligh | nuities are s atly undulos sub-10°. | | | | |
| | | 100 | 27 | 27 | | | | Strong to very s thin to medium I grey to dark gre grained SILICE LIMESTONE. F slightly and loca moderately wea Pyrite dispersed throughout. | bedded, y, fine OUS Fresh to illy thered. | 29.79 | and plan sub-10° | nuities are s ar. Dips are with undulo ical fracture | e se | | | |
| REMA | | | | | | П | | INST | ALLATION | REMA | ARKS | | | | · H: | |
| and | dug | g ins | ectio | on pit | to 1.2m. | | | Heady | works. | | | | | | | |
| | | | | | | | | GROU | JNDWATE | _ | | | | | | |
| NST/ | ALL | _ATIC | ON D | ETA | ILS | | - is | Dat | - | lole epth | Casing Depth | Depth to Water | Comm | ents | | |
| | ate 9-08 | 8 | | epth 0 | RZ Top RZ Base 6.00 13.00 26.50 32.50 | 50 | Type nm S | SP | | | | | | | | |



REPORT NUMBER

| | | | | | | | | | | | | | | | _/ |
|----------------------------|--------------|---------|--|----------|---------------------------|--|--|---------------|--|--|----------------------------------|-----------|--|------------------------|----|
| CONTRACT | D | ublin | Central Developme | ent - Dr | aft | | | | | DRILL SHEE | HOLE N | 0 | RC0 | 8 t 31 of 33 | -(|
| CO-ORDINA | TES(| _) | | | | | LEVEL (m) METER (mm) | 1 | 02 | DATE | STARTE COMPL | | 13/09 | /2008 | _ |
| CLIENT ENGINEER | | | Central Developme onsulting Engineers | ents Ltd | | NCLINATI LUSH | ON | | 90 Polymer Gel | | ED BY | | Millen A. Ma | | |
| Core Run Depth (m) T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) 0 250 500 | Legend | Non-intact zones (shaded) | | escription | Depth (m) | | ontinuities | | Elevation | Standpipe Details | SPT (N Value) | |
| 30.10 | 76 | 58 | 511 | | | thin to magney to a grained LIMEST slightly a moderal bedded black, cas SHALE. slightly a moderal Pyrite di Incipien common Strong, to bedded, black, fin ARGILL LIMEST slightly a moderal pyrite di lock piack, fin ARGILL LIMEST slightly a moderal pyrite di lock, fin ARGILL limest slightly a moderal pyrite di lock, fin ARGILL limest slightly a moderal pyrite di lock, fin ARGILL limest slightly a moderal pyrite di lock, fin ARGILL limest slightly a moderal pyrite di lock, fin ARGILL limest slightly a moderal pyrite di lock, fin ARGILL limest slightly a modera | but. (continued) lely strong to tely weak, thinly to laminated, alcareous Fresh to and locally tely weathered. spersed. It fractures 1. o moderately thin to medium dark grey to the grained ACEOUS ONE. Fresh to and locally tely weathered. spersed but. Local | 30.26 | Discontinuand planar sub-10° w sub-vertica (continued gravel infil 30.47-30.4 sub-10°. | r. Dips anith unduloal fracture (f) ities are so with local (30.32-348m). Dip | ense emooth I clay 0.34m, es are | | | | |
| REMARKS | | | | Ш | | | INSTALLATIO | N REMA | RKS | | | | [<u> </u> [] | | _ |
| land dug ins | pectio | on pit | to 1.2m. | | | | Headworks. | | | | | | <u>. </u> | | |
| | | | | | | | GROUNDWAT | | | | | | | | _ |
| | | | | | | | | Hole Depth | Casing Depth | Depth to Water | Comm | ents | | | |
| | Tip D | epth | RZ Top RZ Base | | Туре | | | | | | | | | | |
| 14-09-08 14-09-08 | 13.0 32.5 | 0 | 6.00 13.00 26.50 32.50 | 50 | mm S | SP. | | | | | | | | | |



REPORT NUMBER

| CO-ORDI CLIENT ENGINEE Core Run Debth (m) https://doi.org/10.000/10.00 | INAT | r ES(| _) ublin | Central Developm Central Developmonsulting Engineers | ents Ltd | 0 | ROUND L | _EVEL (m) | | | | SHEET | HOLE NO STARTE | | 13/09 | 32 of 33 |
|--|------------|--------------|-------------|---|----------|---------------------------|---|--|----------------------|-------------|------------------------|---|-------------------|-----------|-------------------|---------------|
| Downhole Depth (m) TABINATION Core Run Depth (m) | R. | D | ublin | · | | _ < | | ` ' | | | | DATE | STARTE | D | | /2008 |
| Downhole Depth (m) SOM Core Run Depth (m) | | | | · | | - | | | ١. | - 1 | 02 | DATE | COMPLE | TEN | 14/09 | /2008 |
| Core Run Depth (m) | | | | · | | 1 1 | NCLINATIO | | , | | 90 | | | LIED | | |
| | .C.R.% | | | | | | LUSH | | | | olymer Ge | DRILLI LOGG | | | Millen A. Ma | |
| 31 31.00 | _ | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | | scription | | Depth (m) | Disc | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| | | | | | | | thin to m grey to d grained s LIMEST slightly a moderate Pyrite dis througho | o very strong ledium bedde dark grey, fine SILICEOUS ONE. Fresh docally lely weathere spersed but. (continue o moderately | ed, e to d. | 31.02 | to slightly smeared | nuities are si r rough and . Non-intac | clay t. | | | |
| | 100 | 17 | 0 | | | | strong, ti bedded, black, fir ARGILL/ LIMEST slightly a moderate Pyrite dis throughe Strong to | hin to mediuing dark grey to the grained ACEOUS ONE. Freshold locally early weathere spersed out. | m to d. | | and plan sub-10° | nuities are s ar. Dips are with undulo: cal calcite vi | se | | | |
| | | | | | | | grey to d grained : LIMEST slightly a moderate Pyrite dis througho Strong to | | to d. | 31.42 | and plan sub-10° | ouities are s ar. Dips are with undulo: cal calcite v | se | | | |
| 31.70 | _ | | | L | | | bedded, black, fir ARGILL LIMEST slightly a moderate Pyrite dis | dark grey to ne grained ACEOUS ONE. Fresh and locally ely weathere spersed | to d. | 31.72 | | | | | | |
| | | | | | | | calcite ve Strong to thin to m grey to c grained: LIMEST slightly a moderate Pyrite dis througho | o very strong dedium bedde dark grey, fine SILICEOUS ONE. Fresh and locally ely weathere spersed out. Local | ed, e to | | | | | | | |
| | | | | | 井 | | calcite ve | eining. | | 0.4 5- | | | | | | |
| | | | | | H | | | NOT: 11 | TIC | 31.99 | DIVO | | | | i El | |
| EMARK and duo | | pectio | on nit | to 1.2m. | | | | INSTALLA | | KEMA | KKS | | | | | |
| 449 | , . | | post | | | | | Headworks | | | | | | | | |
| | | | | | | | | GROUNDY | _ | _ | | D#: | | | | |
| | | | | | | | | Date | 9333 | ole epth | Casing Depth | Depth to Water | Comm | ents | | |
| ISTALL | ATIC | ח אכ | ETA | ILS | | | | | | | | | | | | |
| Date | | | | RZ Top RZ Base | | Туре | | | | | | | | | | |
| 14-09-08 | | 13.0 | | 6.00 13.00 | | mm : | \D | 1 | 1 | | | | | | | |



REPORT NUMBER

| _ | | | | | | | | | | | | | | | | | | _ |
|--------------------|--------------------|---------|---------------|---------|-----------------------------|------------|---------------------------|--|--|--------------|-----------|--|---|--------------------------|-----------|-------------------|--------------------------|---|
| CON | TRA | СТ | D | ublin | Central Developn | nent - Dra | ıft | | | | | | DRIL SHE | .LHOLE N ET | 10 | RC(|)8 st 33 of 33 | (|
| co-o | RD | INA | ΓES(| _} | | | | | LEVEL (m) METER (mn | n) | | 102 | DAT | E START E COMPL | | 13/09 | 9/2008 | |
| CLIEI | NT | | | ublin | Central Developm | nents Ltd. | ٠ | NCLINATIO | | , | - | 90 | | LED BY | | | nnium | _ |
| ENGII | T | R | A | GL C | onsulting Engineers | s T | F | LUSH | | | F | Polymer G | el LOG | GED BY | | A. Ma | ahony | |
| Downhole Depth (m) | Core Kun Deptn (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Dis | econtinuitie | s | Elevation | Standpipe Details | SPT (N Value) | |
| 32 | .50 | 100 | 50 | 50 | | | • | strong, to bedded, black, fir ARGILL LIMEST slightly a moderat Pyrite di throughe calcite volumestrong to the calcite volumestrong to the calcite volumestrong to the calcite volumestrong, to bedded, black, fir ARGILL LIMEST slightly a moderat Pyrite di throughe calcite volumestrong, to be decalcite volumestrong to be decalcited to be dec | but. Local eining. ed) o very strong hedium bedd dark grey, fin SILICEOUS ONE. Fresh and locally ely weathere spersed but. Local eining. o moderately hin to mediu dark grey to he grained ACEOUS ONE. Fresh and locally ely weathere spersed out. Local | im to to ed. | 32.11 | Disconti and plar sub-10° Disconti and plar sub-10° calcite v Pyrite le | nuities are nar. Dips a with sub-vein fractures 32.34 | smooth are vertical e. m | | | | |
| REMA | | | | | | | | | INSTALLA | ATION | REMA | ARKS | - | | | | | |
| land | dug | insp | ectio | n pit | to 1,2m. | | | | Headworks | 3. | | | | | | | | |
| | | | | | | | | | GROUND | NATE | R DET | AILS | | | | | | |
| | | | | | | | | | Date | Н | ole | Casing | Depth to Water | Comm | nents | | | |
| | | | | | | | | | Date | Į D∈ | epth | Depth | Water | Joann | | | | 1 |
| NSTA | | | | | | | | | | | | | | | | | | (|
| Da 14-09 | | | ip De 13.0 | | 6.00 RZ Base 6.00 13.00 | | Type nm S | | | | | | | | | | | |
| 14-09 | | | 32.5 | | 26.50 32.50 | | nm S | | | | | | | | | | | |



| ie s | IJ | | | | GEOIL | :CHN | IC, | AL CO | RE LOG | RECC | R | (D | | | | 136 | 696 |
|--|---------|---------|---------|------------|------------------|-----------|---------------------------|---|------------------------|---------------|--------------|-------------------|-------------------|--------|-----------|--|-------------------------|
| CONTRA | ACT | Dı | ublin | Central [| Developme | ent - Dra | ft | | | | | | DRILL SHEET | HOLE N | 0 | RC1 | 6 t 1 of 15 |
| CO-ORE | ANK | TES(| _) | | | | 1 | GROUND L | .EVEL (m) METER (mm |) | 1 | 02 | DATE | STARTE | | 18/11 | /2008 |
| CLIENT NGINEI | ER | | | Central I | Developme Ltd | ents Ltd | | INCLINATION | ON | | | 90 Polymer Gel | DRILL LOGG | | | 19/11 Millen A. Ma | 72008 Inium Ihony |
| Downhole Depth (m) Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Spa | | Legend | Non-infact zones (shaded) | De | scription | Denth (m) | (iii) indeed | Disco | ontinuities | | Elevation | Standpipe Details | SPT (N Value) |
| 1 | | | | | | | | HOLE D Observe returns of brick, bla | | s e, e, yy | | | | | | UKKUKUKUKUKUKUKUKUKUKUKUKUKUKUKUKUKUKU | |
| REMARI 8/11/08 | - 63/4 | hrs U | nload | d sludge | tanks, load | l & erect | fen | ncing, dig | INSTALLA | TION RE | M | ARKS | | | | KA KA | |
| nspectio ocation. | n pit | (wide | ned (| due to pip | oe) and mo | ove equip | ome | ent onto | GROUNDV | VATER D | ET | AILS | | | | | |
| | | | | | | | | | Date | Hole Depth | | Casing Depth | Depth to Water | Comm | ents | | |
| NSTALI | _ATI | ON D | ETAI | ils | | | | | | | | | | | | | |
| Date 19-11-0 | 8 | | epth | | RZ Base 8.00 | 50n | | SP | | | | | | | | | |



| 100 | 98 | | | | | 0_0 | | | , LE 00. | 12 200 | | | | | | 13 | 696 | |
|--------------------|--------------------|---------|--------------|---------|---------------|-----------------------|---------------------------------------|---------------------------|---|---|---------------|------------------|---------------------------------------|---------|-----------|--|-------------------------|----|
| СО | NTR | ACT | | ublin | Central | Developmo | ent - Dr | aft | | | | | DRILI | LHOLE N | IO | RC1 | 1 6 t 2 of 15 | |
| СО | -ORI | DINA | TES(| _) | | | | | | LEVEL (m) METER (mm | n) | 102 | DATE | STARTI | | 18/11 | 1/2008 | |
| | ENT | | | | Central I | Developme Ltd | ents Ltd | - 1 | INCLINATION FLUSH | ON | | -90 Polymer 0 | | ED BY | | 19/11 Miller A. Ma | 72008 nnium ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Spa (m | cture acing am) | Legend | Non-intact zones (shaded) | De | escription | Depth (m) | Di | scontinuities | i | Elevation | Standpipe Details | SPT (N Value) | |
| 3 | | ve. | | | | • | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | HOLE D Observe returns of gravelly (continu | ETRIX OPEN PRILLING: d by driller a of gravelly cla | 2.50 say | | | | | KUIRKUIKKIKOIKKUIKUIKUIKUIKUIKUIKUIKUIKUIKUIKUIKUIKU | N = 4 (20, 5, 1, 1) | 1, |
| 18/1 | MAR 11/08 | - 6¾ | hrs U | nload | sludge | tanks, load | l & erec | t fer | ncing, dig | INSTALLA | TION REM | IARKS | | | | | | |
| insp | ectio Ition. | n pit | (wide | ned o | due to pip | oe) and mo | ve equ | ipme | ent onto | | | | | | | | | |
| | | | | | | | | | | GROUNDY | | | · · · · · · · · · · · · · · · · · · · | _, | | | | |
| | | | | | | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comm | ents | | | |
| NS. | ΤΔΙΙ | ΔΤΙ | ON D | FTAI | I S | | | | _ | | | | | | | | | |
| | Date | | | | | RZ Base | | Туре | 9 | | | | | | | | | |
| 19- | ·11-0 ·11-0 | 8 | 8.00 25.0 |) | 4.50 20.00 | 8.00 25.00 | 50 | mm mm | SP | | | | | | | | | |



| 00 | 68 | | | | , | GEUIE | CHI | NIC/ | AL COP | KE LUG | REC | JK | עו | | | | 130 | 696 | |
|--------------------|--------------------|---------|--------------|---------|---------------|-----------------------|-----------|---------------------------|-------------------|--|------------|-----------|------------------|---------------|----------|-----------|-------------------|--------------------------|---|
| СО | NTR | ACT | D | ublin | Central I | Developme | ent - Dra | aft | | | | | | DRI SHE | LLHOLE N | 10 | RC1 | 6 t 3 of 15 | _ |
| СО | -ORE | DINA: | TES(| _) | | | | | | LEVEL (m) VIETER (mm |) | 1 | 02 | DA | E START | | 18/11 | 1/2008 | |
| | IENT GINE | | | | Central I | Developme Ltd | ents Ltd | ' | NCLINATIO | ON | | | 90 Polymer Ge | ł | LLED BY | | | 1/2008 Inium ahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Spa (m | cture icing im) | Legend | Non-intact zones (shaded) | De | scription | | Deptn (m) | Dis | continuiti | es | Elevation | Standpipe Details | SPT (N Value) | |
| 5 | | | | | | | | | HOLE D Observe | TRIX OPEN RILLING: d by driller a- of gravelly cla ed) | s | | | | | | | | |
| | MAR | | hre I | Ininar | l sludne | tanks, load | i & erec | et fen | cina dia | INSTALLA | TION R | EM/ | ARKS | | | -1 | | | _ |
| insp | pectic ation. | n pit | (wide | ened o | due to pi | pe) and mo | ove equ | ipme | nt onto | _ | | | | | | | | | |
| | | | | | | | | | | GROUNDV | VATER Hole | | Casing | Donth | - T | | | | |
| | | | | | | | | | | Date | Dept | | Depth Depth | Depth Wate | Comn | nents | | | |
| INS | TAL | LATI | ON E | ETAI | LS | | | | | | | | | | | | | | |
| | Date | Τ. | Γip D | epth | RZ Top | RZ Base | | Туре | | | | | | | | | | | |
| 19 19 | -11-0 -11-0 | 8 | 8.00 25.0 |) | 4.50 20.00 | 8.00 25.00 | 50 | mm s | SP | | | | | | | | | | |



| 00 | 38 | 5 | | | | 0_0 | _0, ,, | | AL OU. | L LOO | 1 // 1 | , O i | | | | | 13 | 696 |
|--------------------|--------------------|---------|---------|---------|---------------|-----------------------|----------|---------------------------|--------------------|---|------------|-----------|------------------|-------------------|---------------|-----------|-------------------|-----------------------------------|
| СО | NTR | ACT | D | ublin | Central I | Developm | ent - Dr | aft | | | | | | | LHOLE | 10 | RC1 | |
| СО | -ORI | DINA. | TES(| _) | | | | | GROUND | LEVEL (m) | | | | SHE | ET E START | ED | | t 4 of 15 1/2008 |
| | | | | | | | | _ | | METER (mr | n) | | 102 | | E COMPI | | | (2000) |
| | ENT | | | | Central I | Developm Ltd | ents Ltd | | INCLINATE FLUSH | ON | | | -90 Polymer G | | LED BY | | | 1/2008 nnium ahony |
| | | | | | | | | | | | | | | | 02001 | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Spa (m | cture icing am) | Legend | Non-intact zones (shaded) | De | escription | | Depth (m) | Dis | scontinuitie | es | Elevation | Standpipe Details | SPT (N Value) |
| 7 | | | | | • | | | | HOLE D | TRIX OPEN RILLING: d by driller a f gravelly cl ed) | ıs İ | | | | | | | N = 41 (1, 2, 2, 4, 15, 20) |
| | ARI | | are I I | nloac | l eludae i | tanks, load | 1 & oroc | et for | ncipa dia | INSTALL | ATION F | REMA | ARKS | | | | | |
| nsp | ectio: | n pit | wide | ned o | due to pip | oe) and mo | ove edn | ipme | ent onto | | | | | | | | | |
| | | | | | | | | | | GROUND | | | | | | | | |
| | | | | | | | | | | Date | Hol Dep | | Casing Depth | Depth to Water | Comn | nents | | |
| Ne | ΓΔΙΙ | ΔΤΙ | ט ואנ | ETAI | ıs | | | | | | | | | | | | | |
| _ | Date | | | | | RZ Base | | Туре | е | | 1 | | | | | | | |
| 19- | 11-0 11-0 | 8 | 8.00 |) | 4.50 20.00 | 8.00 25.00 | 50 | mm mm | SP | | | | | | | | | |



| 00 | 38 | | | | (| GEOTE | CHN | IIC/ | AL COI | RE LOG | RECO | RD | | | | | 136 | 696 |
|--------------------|----------------------------------|-----------------|--------------|---------|--------------|-----------------------|---------------------------------------|---------------------------|--|------------------------|---------------|-----------------|--------|------------------|--------|-----------|--------------------------|------------------------------------|
| СО | NTR | ACT | D | ublin | Central t | Developme | ent - Dra | aft | | | | | | DRILL | HOLE N | 0 | RC1 | 6 t 5 of 15 |
| со | -ORI | DINA | TES(| _) | | - 10 | | | | LEVEL (m) METER (mm | ı) | 102 | | DATE | STARTE | | 18/11 | /2008 |
| | ENT GINE | | | | Central I | Developme Ltd | nts Ltd | | NCLINATION | ON | | -90 Polymer | Gel | DRILL | | | 19/11 Miller A. Ma | /2008 nnium |
| | | | | | or isolating | Liu | | | LUSH | - 7 | | Polymer | Gei | LOGG | COBI | | A. IVIE | inorty |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Spa (m | cture icing im) | Legend | Non-intact zones (shaded) | De | scription | Depth (m) | |)iscon | tinuities | | Elevation | Standpipe Details | SPT (N Value) |
| 18/ | MAR 11/08 pectic ation. | 8- 6¾ on pit | hrs U | Inloac | d sludge | tanks, loac | o o o o o o o o o o o o o o o o o o o | ct fene | HOLE E Observe retums of (continu | INSTALLA | ay 10.0 | MARKS | | nonth to | | | | N = 46 (2, 4, 8, 10, 12, 16) |
| | | | | | | | | | | Date | Hole Depth | Casing Depth | D | epth to Water | Comm | ents | | |
| | | | | | | | | | | | - Spall | 2000 | | | | | | |
| | | | | ETAI | | D7 D | | T | | | | | | | | | | |
| 19 | <u>Date</u> -11-0 | 8 | 70.8 8.00 |) | 4.50 | RZ Base 8.00 | 50 | Type mm 9 | SP | † | | | | | | | | |
| 19 | -11-0 | 8 | 25.0 | 0 | 20.00 | 25.00 | | mm S | | | | | | | 1 | | | |



| 108 | | | | | | | | , | | | • | | | | | 130 | 696 |
|-----------------------------|----------------------------------|----------------|---------|------------------------|-------------------------|-----------|---------------------------|------------------|--|--------------------|-----------|-----------------|-------------------|-----------------|-----------|-------------------|--------------------------|
| ONTR | ACT | D | ublin | Central [| Developme | ent - Dra | ft | | | | | | DRILL | HOLE N | o | RC1 | 6 t 6 of 15 |
| :0-0RI | DINA | TES(| _) | | | | | | LEVEL (m) METER (mm | 1) | 1 | 02 | DATE | STARTI COMPL | | 18/11 | /2008 |
| LIENT | | | | Central [onsulting | Developme Ltd | ents Ltd | | CLINATIO .USH | ON | | | 90 Polymer G | 1 | ED BY | | | /2008 nnium ahony |
| Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Spa | | Tegend | Non-intact zones (shaded) | De Clayey C | scription | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | sPT (N Value) |
| | 87 | 0 | 0 | | | | | Dark bro | d and coarse own, firm, sa CLAY. Grav ed and medic | 10 ndy rel |).20 | | | | | | (2, 3, 3, 11, 17, 19) |
| 10.40 | | | | | | | | gravelly | own, slightly (fine) SAND n to fine) | |).85 | | | | | | |
| | 100 | 0 | 0 | | | | | slightly s | own, firm to s andy, gravel Gravel is fine , sub-angula ded. | stiff, ly to | 1.10 | | | | | | |
| 11.90 | | | | | | 0 | | | | | i.90 | | | | | | |
| EMAR 3/11/08 spection | 3- 6 ³ / ₄ | nrs U (wide | nload | d sludge t | anks, load e) and mo | & erect | fencia | ng, dig | INSTALLA | TION R | ⊨MA | KKS | | | | - | |
| cation. | | (**** | riou (| ado to pip | o, and me | ve equi | JIII GIII. | CINO | GROUNDY | VATER | DET | AILS | | | | | |
| | | | | | | | | | Date | Hole Dept | | Casing Depth | Depth to Water | Comm | ents | | |
| OT | | | | | | | | | | | • | | 7 50001 | | | | |
| STAL Date | | | | | RZ Base | 1 | уре | | | | | | | | | | |
| 9-11-0 9-11-0 | 8 | 8.00 25.0 |) | 4.50 20.00 | 8.00 25.00 | 50n | nm SF nm SF | | | | | | | | | | |



| IG | 8 | | | | | | | | | RE LOG RE | | _ | | | | 136 | 596 |
|----------------------|----------------------------|---------|-----------------------|---------|------------------------------|-------------------------|-----------|---------------------------|--|--|---------------|------------------------------------|---|------------------|-----------|--------------------------|-------------------------|
| AO: | ITR | ACT | D | ublin | Central De | velopme | nt - Drai | t | Cons. Phys. | | | | DRILL SHEE | HOLE N | 0 | RC1 | 6 t 7 of 15 |
| O-4 | ORE | OINA. | ΓES(| _} | | | | | | LEVEL (m) METER (mm) | 1 | 102 | DATE | STARTE COMPLI | | 18/11 | /2008 |
| | INE | ER | | | Central De onsulting Ltd | | nts Ltd | | NCLINATION TO SELUSH | ON | | 90 Polymer Ge | | ED BY | | 19/11 Millen A. Ma | /2008 inium ihony |
| © Downhole Depth (Ⅲ) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fractu Spacir (mm) | ng) 500 | Legend | Non-intact zones (shaded) | | scription | Depth (m) | Disc | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 1 | 2.30 | 100 | 0 | 0 | | | 0 0 | | slightly s CLAY w cobbles. to coars | andy, gravelly ith occasional Gravel is fine e, sub-angular ounded. Loss of v 0.2m. | | | | | | | |
| | | | | | | | 0. 0. 0. | | Very da | yey | 12.60 | | | | | | |
| | | | | | | | | | cobbles LIMEST moderat | olack) gravelly of argillaceous ONE (probable e to highly ed bedrock). | | | | | | | |
| 3 | | 100 | | | | | | | Moderat | ely strong to | 13.03 | Discontir | uities are s | | | | |
| | | 100 | 41 | 9 | | | | | bedded to black, ca SHALE. slightly v | ely weak, thinly to laminated, alcareous Fresh to veathered with fractures. | | and sligh | ar. Clay sm tly iron oxid 13.51m-13 sub-10°. | le | | | |
| | | | | | | | | | Strong to | o locally ely strong, thin | 13.70 | | nuities are s | | | | |
| 1: | 3.90 | 92 | | | | | | | to mediu to dark g grained LIMEST | m bedded, grey | | planar. Ir 13.7m-13 clay sme | on oxide st 3.9m. Hea | ained vily | | | |
| /1′ | | - 6¾ | | | d sludge tar due to pipe) | | | | | INSTALLATIO | | | | | | | |
| | | | | | | | | | | Date | Hole Depth | Casing | Depth to Water | Comme | ents | | |
| | | ATIO | _ | | | | | _ | | • | м | Depth | | celt | | | |
| 9-1 | <u>ate</u> 11-0 11-0 | 8 | ip De 8.00 25.0 |) | 4.50 | Z Base 8.00 25.00 | 50m | ype im S im S | SP. | | | | | | | | |



REPORT NUMBER

| 10 | 9 | 5 | | | | | | | | | | | | | | 100 | 096 |
|--------------------|--------------------|---------|---------|-------|---|-----------|---------------------------|--|--|-----------|-----------|--|---|----------------------------|-----------|-------------------|----------------|
| ON. | TR/ | CT | D | ublin | Central Developm | ent - Dra | aft | | | | | | DRILL | HOLE N | 0 | RC1 | |
| | | | | | | | 1 | | | | | | SHEET | | | Shee | t 8 of 15 |
| 0-0 | ORD | INA | FES(| _) | | | - 1 | GROUND I | LEVEL (m) | | | | DATE | STARTE | D | 18/11 | /2008 |
| | | | | | | | (| CORE DIA | METER (mm |) | 1 | 02 | DATE | COMPL | ETED | | |
| LIE | NT | | ח | ublin | Central Developm | ents I td | 1 | INCLINATION | NC | | -9 | 90 | DRILL | ED BY | | 19/11 Miller | 72008 Inium |
| NGI | | ER. | | | onsulting Ltd | | | FLUSH | | | P | Polymer G | | | | | ahony |
| | | | | | y | | | 1 | | | İ | | 1=000 | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 14 | 7 | | | | | = | | Moderat | ely strong to | _ | 14.02 | Non-Inta | act | | | | |
| | | | | | | | | moderat bedded t black, ca SHALE. slightly v | ely weak, thing to rely weak, thing to laminated, alcareous Fresh to veathered with fractures. | nly th | 14.28 | Disconti and plar smeared with vari | nuities are s nar and heav d. Dips are s able fracture | rily clay ub-10° es. | | | |
| | | | | | | | | thin to m grey to d grained | o very strong nedium bedde dark grey, find SILICEOUS ONE. Fresh | ed, | 14.48 | | nuities are s nar. Dips are | | | | |
| | | 100 | 43 | 29 | | | | Moderat moderat bedded black, ca | ely strong to ely weak, thi to laminated, alcareous | niy | | and plar | nuities are s nar. Clay sm -14.71m. Di | eared | | | |
| | | | | | | | | SHALE. | Fresh | | | | | | | | |
| 15 | | | | | | | | strong, t bedded, grained | o moderately hin to mediu dark grey, fir | m | 15.01 | and plan | nuities are s nar. Clay sn Dips are | | | | |
| | | | | | | | | LIMEST locally si weather | | | 15.28 | to slightl | nuities are s ly rough and Dips are sub | | | | |
| 15 | .40 | | | | | | | bedded, grey, find SILICEC LIMEST slightly v | grey to dark e grained DUS ONE. Fresh veathered. | to | 15.20 | | nuities are s nar. Dips are | | | | |
| | | | | | ŀ | | | Moderat moderat bedded black, ca SHALE. | nse 15.25m. ely strong to ely weak, this to laminated, alcareous Fresh. Pyri | nty | | | | | | | • |
| | | | | | | | | lense 15 | o.JbM. | | | | | | | | |
| | | | | | | | | | | | 15.84 | | | | | | |
| | | | | | | Ξ | | | | | | | nuities are s nar. Dips an | | | | |
| EM/ | AR | (S | - | _ | | | _ | 1 | INSTALLA | TION | REM4 | ARKS | | | | V//A | |
| 8/11 | /08- ctio | 63/4 | | | l sludge tanks, loa due to pipe) and m | | | | - | | | | | | | | |
| | | | | | | | | | GROUNDY | | | | 1 | | | | |
| | | | | | | | | | Date | Ho Dei | | Casing Depth | Depth to Water | Comm | ents | | |
| ICT. | A1 ' | ATIC | יין אר | ETA! | ıe | | | | | | | - vp41 | | | | | |
| | ate | | | ETAI | RZ Top RZ Base | 2 | Туре | 9 | | 1 | | | | | | | |
| 19-1 | _ | _ | 8.00 | _ | 4.50 8.00 | | mm | | | | | | | | | | |
| | 1-0 | a | 25.0 | Λ I | 20.00 25.00 | I 50 | mm: | en en | | 1 | | | I . | 1 | | | |



| CO | NTR | ACT | D | ublin | Central Develop | ment - D |)raft | | | | | | HOLE N | 0 | RC1 | |
|--------------------|--------------------|---------|---------|---------|---------------------------------------|----------|------------------------------|---|-------------------------|-----------|--------------------|---|------------------|-----------|--------------------------|-------------------------|
| СО | -ORI | DINA. | TES(| _) | | | | | LEVEL (m) METER (mm) | | 102 | | STARTE COMPLI | | 18/11 | 9 of 15 /2008 |
| | IENT GINE | | | | Central Develop onsulting Ltd | ments L | td | INCLINATION FLUSH | ON | | -90 Polymer Ge | | ED BY ED BY | | 19/11 Millen A. Ma | /2008 inium ihony |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | | More lating and the death of | De | escription | Depth (m) | Disc | ontinuities | | Elevation | Standpipe Details | SPT (N Value) |
| 16 | 17.10 | 100 | 94 | 82 | | | | strong, i bedded, grained ARGILL LIMEST locally s weather | ed. (continued) | 17.20 | and plans sub-10°. | uities are s ar. Dips are (continued) rough and ips are sub | enooth | | | |
| | | 100 | 100 | 100 | | | | grained LIMEST argillace Slightly | | | fracture t | vertical cal hroughout. | cite | | | |
| 18/ | | - 6¾ | | | d sludge tanks, k due to pipe) and | | | | INSTALLATIO | ON REM | ARKS | | | | | |
| | ation. | | | | , | - | | | GROUNDWA | TER DE | TAILS | | | | | |
| | | | | | | | | | Date | Hole | Casing | Depth to Water | Comm | ents | | |
| | | | | | | | | _ | | Depth | Depth | **atel | 1 | | | |
| | | | | | | | | | | | | | | | | |
| | TAL Date | | ON D | | RZ Top RZ Ba | | Ту | | | | | | | | | |



REPORT NUMBER

| 100 | 8 | 5 | | | | | | 4E 001 | KE LUG | | ٠.٠ | _ | | | | 136 | 696 |
|--------------------|--------------------|------------------|---------|---------|---|-----------|---------------------------|---|--|---------------|-----------|---|---|-------------------------------------|-----------|--------------------------|----------------------|
| ON | TR/ | ACT | D | ublin | Central Developm | ent - Dra | aft | | | | | | DRIL | LHOLE N | O | RC1 | 6 10 of 15 |
| 0-0 | RD | INA [.] | ΓES(| _) | | | | | .EVEL (m) METER (mm) | ı | 1 | 02 | | STARTE | | 18/11 | /2008 |
| LIE | | ER . | | | Central Developmonsulting Ltd | ents Ltd | | NCLINATIO | ON | | | 90 olymer Ge | | LED BY SED BY | | 19/11 Millen A. Ma | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) 0 ²⁵⁰ 500 | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Disc | continuities | 3 | Elevation | Standpipe Details | SPT (N Value) |
| 18 | 33.20 | 100 | 100 | 91 | | | | to mediu to dark g grained LIMEST argillace Slightly v sub-vert throughd | o locally ely strong, thi m bedded, gr grey, fine SILICEOUS ONE with ous zones. weathered wit ical calcite ve out. (continue | h in d) | 3.92 | to slightly planar. Ë with sub- fracture (continue | nuities are y rough an pips are su vertical ca throughout ed) | d b-10° licite | | | |
| 19 | 9.80 | 100 | 43 | 33 | | | | strong, t bedded, grained ARGILL LIMEST siliceous locally sil weather 19.39m. | hin to mediun dark grey, fin ACEOUS ONE (slightly b). Fresh to ightly ed. Pyrite len | e se | 1.68 | and plan sub-10° fractures Discontinuand plan sub-10°. Discontinut to slightly | ar. Dips a with sub-vi 19.14m-1 inuities are ar. Dips ar viities are y rough an | re ertical 9.39m. smooth e smooth d | , | | |
| REMA | ARK | (S | | | | 田 | | | fractures | TION R | EMA | • | nps are su | D*10 . | | | |
| 8/11 | /08- ctior | 63/4 | | | d sludge tanks, load due to pipe) and m | | | | | | | | | | | | |
| vatri | JI 1. | | | | | | | | GROUNDW | | | | | | | | |
| | | | | | | | | | Date | Hole Depti | | Casing Depth | Depth to Water | Comm | ents | | |
| | | | | | | | | | | . — | | | | | | | |
| | - | | | ETAI | | | T | | | | | | | | | | |
| D: 19-1 | ate 1-08 | | 8.00 | _ | RZ Top RZ Base 4.50 8.00 | | Type nm S | | | | | | | | | | |
| J- I | 1-08 | | 25.0 | | 20.00 25.00 | | nm S | | | | | | | 1 | | | |



| 00 | 38 | | | | (| SEOTE | CHN | IICA | AL COF | RE LOG | RE | COR | KD. | | | | 136 | 896 | |
|---|--------------------|--|--------------|---------|---------------------------|--------------------------------|-----------|---------------------------|---|--|-----------------|-----------|---|---|-------------------------------------|-----------|-------------------|---------------|--|
| СО | NTR | ACT | D | ublin | Central I | Developme | ent - Dra | ıft | | | | | | DRILL | HOLE N | 0 | RC1 | 6 11 of 15 | |
| СО | -ORI | DINA | TES(| _) | | 942 | | | | LEVEL (m) DATE STAR METER (mm) 102 DATE COMP | | | | STARTI | TED 18/11/2008 | | | | |
| | ENT | The second secon | | | | | | | | INCLINATION -90 | | | | | DRILLED BY 19/11/2008 Millennium | | | | |
| EN | SINE | ER | Α | GL C | onsulting I | Ltd | | F | LUSH | | | F | Polymer Ge | LOGG | ED BY | | A. Ma | hony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Frac Spa (m 0 25 | cing m) ⁰ 500 | Legend | Non-intact zones (shaded) | De | scription | | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) | |
| 20 | | | | | | 61 | • — — | | thin to m grey to d grained S LIMESTO argillace | o very strong ledium beddi lark grey, fin SILICEOUS ONE, locally ous zones. continued) | ed, e | 20.41 | to slightly | nuities are s y rough and lips are sub ed) | 2000-000 | | | | |
| - | | 100 | 59 | 57 | | | | | strong, the bedded, grained ARGILL | | m ne 1 to | 20.88 | and plan sub-10° | nuities are s ar. Dips an with sub-ve 20.7m-20. | e rtical | | | | |
| - - ₂₁ | | | | | ľ | | | | thin to m grey to d grained S LIMEST | o very strong ledium beddi lark grey, fin- SILICEOUS ONE. Fresh nse 20.93 & | l, ed, e | 21.14 | to slightly planar. E with sub 20.88m- | | -10° cture | | | | |
| - | 21.20 | | | | | | | | moderate bedded, calcareo Fresh to | us SHALE. locally sligh ed with incipi | nly tly | 21.42 | and plan infilled 2 Dips are | nuities are s ar. Black cla 1.2m-21.24 sub-10°. | ay m. | | | | |
| المسال المسال المسال المسال المسال المسال المسال المسال المسال المسال المسال المسال المسال المسال المسال المسال | • | | | | ŀ | | | | Strong to strong, the bedded, grained ARGILL | o moderately hin to mediu dark grey, fi ACEOUS ONE. Fresh ightly | m ne | | and plan sub-10° fractures 21.76m- | nuities are s ar. Dips an with sub-ve 5 21.51-21.6 21.92m and 22.69m-cla | e rtical 88m, 1 | | | ٠ | |
| ~ | | | | | | | | | | | | | | | | | :目: | | |
| RE | MAR | KŞ | | | | | | | | INSTALLA | ATION | REM | ARKS | | | | r. 🗆 · | | |
| 18/ insp | 11/08 pectic | 3- 6¾ on pit | | | | anks, load | | | | HO PELP | | | | | | | | | |
| loca | ation. | | | | • | • | · | | | GROUNDY | VATE | R DE1 | AILS | | | | | | |
| | | | | | | | | | | Date | Н | ole | Casing | Depth to Water | Comm | ente | | | |
| | | | | | | | | | | Date | De | epth | Depth | Water | Comm | ens | | | |
| INS | TAL | LATI | ON D | ETA | ILS | | | | | | | | | | | | | | |
| | Date | 1 | Γip D | epth | RZ Top | RZ Base | | Туре | | | | | | | | | | | |
| | -11-0 -11-0 | | 8.00 25.0 | | 4.50 20.00 | 8.00 25.00 | | nm S | | | | | | | | | | | |



| O | NTR | ACT | D | ublin | Central Developn | nent - Dra | aft | | | | | DRILL SHEE | HOLE N | 0 | RC1 | 6 12 of 15 |
|--------------------|--------------------|---------|---------|---------|---|------------|---------------------------|---|---|-----------|--|---|--|-----------|--|---------------|
| | ORE | ANIC | TES(| | Central Developn | nents Ltd | C | | DIAMETER (mm) 102 DA | | | DATE | DATE STARTED DATE COMPLETED DRILLED BY | | 18/11/2008 19/11/2008 Millennium | |
| NC | INE | ER | Α | GL C | onsulting Ltd | | F | LUSH | | F | Polymer G | el LOGG | ED BY | | A. Mahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) 0 ²⁵⁰ 500 | Legend | Non-intact zones (shaded) | De | scription | Depth (m) | Dis | continuities | | Elevation | Standpipe Details | SPT (N Value) |
| 222 | | 100 | 55 | 47 | | | | strong, t bedded, grained ARGILL LIMEST locally s weather | ed. (continued) | 22.70 | and plar sub-10° fractures fractures 22.45m- 22.45m- smeared | nuities are s ar. Dips are with sub-ve s 21.51-21.6 21.92m and 22.69m-cla l. (continued | ertical 8m, I | | | - |
| 223 | 22.90 | 100 | 100 | 87 | | | | thin to m grey to d grained | o very strong, ledium bedded, dark grey, fine SILICEOUS ONE. Fresh to lightly ed. | 23.50 | to slightly | nuities are s y rough and Dips are sub | | | | |
| 2 | 23.50 | | | | | | | strong, t bedded, grained ARGILL LIMEST locally si | ed. Pyrite lense | 23.99 | and plan | nuities are s ar. Clay sm 3.58m. Dip | eared | | | |
| | 1/08 | | nrs II | nloac | sludge tanks, loa | ad & erec | t fend | cina dia | INSTALLATIO | REMA | ARKS | | | | | |
| sp | ectio tion. | n pit | (wide | ned o | lue to pipe) and n | nove equi | pmei | nt onto | | | | | | | | |
| | | | | | | | | | GROUNDWATE | R DET | AILS Casing | Donth to | 1_ | | | |
| | | | | | | | | | | epth | Depth | Depth to Water | Comm | ents | | |
| us: | ΓALL | | | ETAI | | | | | | | | | | | | |
| _ | | - | | - | RZ Top RZ Base | 1 | Туре | | | | | | | | | |



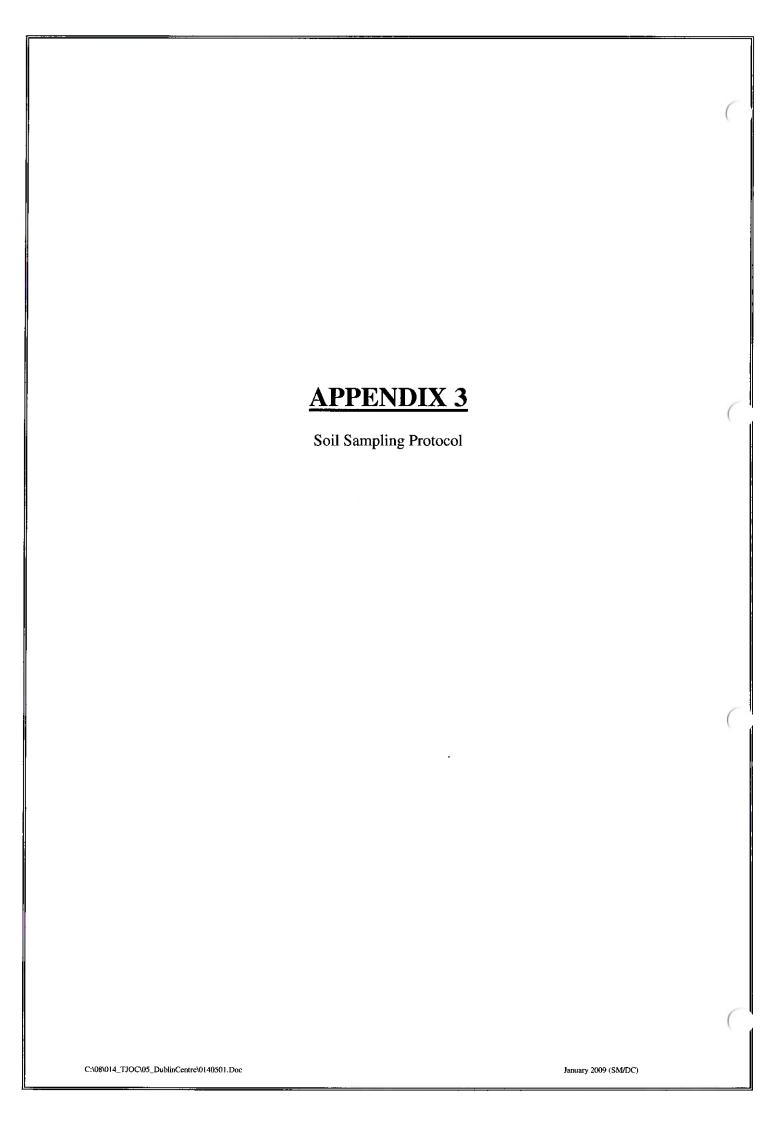
| CO | NTR | ACT | D | ublin | Central Developm | ent - Dra | aft | | *** | | | DRILL SHEET | HOLE NO |) | RC16 | 3 13 of 15 |
|---|--------------------|---------|---------|---------|--|-----------|---------------------------|---|--|--------------|---|---|------------------|-----------|---------------------------------------|---------------|
| СО | -ORI | OINA" | ΓES(| _) | | | | | LEVEL (m) METER (mm) | | 102 | DATE | STARTE COMPLE | | 18/11/ | 2008 |
| CLIENT Dublin Central Developments Ltd INCLINAT ENGINEER AGL Consulting Ltd FLUSH | | | | | | | | | ON | | 90 Polymer Ge | | ED BY ED BY | | 19/11/2008 Millennium A. Mahony | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) 0 250 500 | Legend | Non-intact zones (shaded) | De | escription | Depth (m) | Dîsc | ontinuities | | Elevation | Standpipe Details | SPT (N Value) |
| 25 | 24.90 | 100 | 91 | 73 | | | | moderal bedded black, co SHALE. (continu Strong to strong, to bedded, grained ARGILL LIMEST locally so weather 24.35m | o moderately thin to medium dark grey, fine ACEOUS ONE. Fresh to | 24.21 | and plansub-10°. Discontinand plansub-10°. | uities are s ar. Dips are (continued) uities are s ar. Dips are | mooth | | | |
| | | 100 | 100 | 95 | F | | | | | 26.00 | | | | | | |
| | //AR | | nrs I | nload | l sludge tanks, loa | d & erec | t fei | ncina dia | INSTALLATIO | - | ARKS | | | | W/// A | |
| insp | | | | | due to pipe) and m | | | | | | | | | | | |
| | | | | | | | | | GROUNDWAT | | | Do-th t- | T | | | |
| | | | | | | | | | | Hole epth | Casing Depth | Depth to Water | Comme | ents | | |
| | | | | | | | | | • | | | | | | | |
| INS | TAL | _ATIC | ם אכ | EIA | LS | | | | | | | | | | | |
| _ | TALI Date | | ip De | | RZ Top RZ Base | | Тур | | | | | | | | | |

| | СО | NTR | / | TES |
|---|----------------|----------------|---------|---------|
| | | ENT SINE | | |
| | Downhole Depth | Core Run Depth | T.C.R.% | S.C.R.% |
| ı | 26 | | | |

| CONTRACT Dublin Central Development - Draft CO-ORDINATES | 00 | 38 | IJ | | | | | | . •. | | | | | _ | | | | 136 | 596 |
|--|-----|--------------------|---------|---------|-------|-----------|-----------------------------------|-----------|---------------------------|---|--|-------------------------------|-----------|---|--|------------|-----------|-------------------|---------------|
| CO-CRDINATES(_) CREDIAMETER (mm) 102 DATE STARTED DATE COMPLETED INCLINATION DELICATION Developments Ltd. INCLINATION DELICATION Developments Ltd. AGL Consulting Ltd Friedure Specing (mm) 2 | COI | NTR/ | ACT | D | ublin | Central | Developm | ent - Dra | ft | | | | | | | | Ó | | |
| PLUSH Polymer Gel LOGGED BY A Mehony First Litre Spanning (mm) By Carlot Common Comm | co- | ORE | NA. | TES(| _) | | | | | | |) | 1 | 02 | DATE | | | | |
| Storog to mediarately process to the median bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh. Storog to very strong, the median bedded, grey to dark grey, fine grained SLICEOUS LIMESTONE. Fresh. Storog to very strong, the median bedded, grey to dark grey, fine grained SLICEOUS LIMESTONE. Fresh. Strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh Strong to moderately weak, thinly bedded, dark grey, fine grained SLICEOUS LIMESTONE with interbedded slineous imestone. Fresh. Pyrite lense 27.0m. Moderately veak, thinly bedded, dark grey, fine grained GLICEOUS LIMESTONE with interbedded slineous imestone. Fresh. Pyrite lense 27.0m. Moderately veak, thinly bedded, black, calcareous SHALE. Fresh Strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh Pyrite lense 27.0m. Moderately veak, thinly bedded, black, calcareous SHALE. Fresh Strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh Pyrite lense 27.0m. Discontinuities are smooth and planar. Dips are sub-10°. Discontinuities are smooth and planar. Dips are sub-10°. Strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh Pyrite lense 27.7m. Discontinuities are smooth and planar. Dips are sub-10°. Strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh Pyrite lense 27.7m. Discontinuities are smooth and planar. Dips are sub-10°. Strong to very strong to moderately weak, thinly bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh. Strong to very strong to moderately weak, thinly bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh. Strong to very strong to moderately weak. The medium bedded, grained SILICEOUS LIMESTONE. Fresh. Strong to very strong to the medium bedded, grained SILICEOUS LIMESTONE. Fresh. Strong to very strong to the medium bedded, grained SILICEOUS LIMESTONE. Fresh. Strong to very strong to the medium bedded, grained SILICEOUS LIMESTONE. Fresh. Strong to very strong to the medium bedded to be planar. Dips are sub-10 | | | ER | | | | | ents Ltd | | | | | - | DRILLED BY | | | | | |
| strong, finis to medium bedded, dark grey, fine grained ARCILLATION DETAILS Strong to way strong, thin to medium bedded, stark grey fine grained SLICEOUS LIMESTONE. Fresh. Strong to may strong, thin to medium bedded, back, calcareous SHALE. Fresh Strong to moderately strong to moderately strong, thin to medium bedded, stark grey, fine grained SLICEOUS LIMESTONE with interbedded siliceous timestone. Fresh. Pyrite lense 27.0m. Moderately strong to moderately strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh Strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh Strong to moderately weak, thinly bedded, black, calcareous SHALE. Fresh Strong to moderately weak, thinly bedded, black, calcareous SHALE. Strong to moderately weak, thinly bedded, black, calcareous SHALE. Strong to moderately weak, thinly bedded, thank, grey fine grained SLICEOUS LIMESTONE. Fresh. Strong to weak strong to moderately strong, thin to medium bedded, dark grey, fine grained SLICEOUS LIMESTONE. Fresh. Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SLICEOUS LIMESTONE. Fresh. Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SLICEOUS LIMESTONE. Fresh. Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SLICEOUS LIMESTONE. Fresh. SIMESTONE. Fresh. Strong to moderately strong to moderately strong, thin to medium bedded, grey to dark grey, fine grained SLICEOUS LIMESTONE. Fresh. SIMESTONE. Fresh. STRONG TOWN TOWN TOWN TOWN TOWN TOWN TOWN TOWN | - 1 | Core Run Depth (m) | T.C.R.% | S.C.R.% | ദ് | Spa (m | acing am) ⁵⁰ 500 | Puegend | Non-infact zones (shaded) | | | | Depth (m) | | | emooth | Elevation | Standpipe Details | SPT (N Value) |
| moderately weak, thinly bedded, black, calcareous SHALE. Fresh Strong to moderately strong, thin to medium bedded, dark grey, fine grained planar. Dips are sub-10°. Moderately weak, thinly bedded, black, calcareous shale. Fresh Pyrite lense 27.0m. Moderately weak, thinly bedded, black, calcareous shale. Fresh Pyrite lense 27.0m. Moderately weak, thinly bedded, black, calcareous shale. Fresh Pyrite lense 27.0m. Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh. Strong to very strong, thin to medium bedded, gray fine grained ARGILLACEOUS LIMESTONE. Fresh. Strong to very strong, thin to medium bedded, gray fine grained ARGILLACEOUS LIMESTONE. Fresh. Strong to very strong, thin to medium bedded, gray fine grained and planar. Dips are sub-10°. Strong to very strong, thin to medium bedded, gray fine grained and planar. Dips are sub-10°. Strong to very strong, thin to medium bedded, gray fine grained sub-10°. Strong to very strong, thin to medium bedded, gray fine grained sub-10°. Strong to very strong, thin to medium bedded, gray fine grained sub-10°. Strong to very strong, thin to medium bedded, gray fine grained sub-10°. Strong to very strong, thin to medium bedded, gray fine grained sub-10°. Strong to very strong, thin to medium bedded, gray fine grained sub-10°. Strong to very strong, thin to medium bedded, gray fine grained sub-10°. Strong to were strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to moderately sub-10°. Strong to modera | | | | | | ŀ | | | | strong, to bedded, grained ARGILL LIMEST Strong to thin to m grey to d grained to | hin to mediui dark grey, fil ACEOUS ONE. Fresh o very strong ledium bedde dark grey, fine SILICEOUS | m ne , , ed, e | | and plar sub-10° Disconti to slighti | nar. Dips an nuities are s y rough and | emooth | | | |
| moderately weak, thinly bedded, black, calcareous SHALE. Fresh Strong to moderately strong, thin to medium bedded, dark grey, fine grained ARGILLACEOUS LIMESTONE. Fresh. Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh. Strong to very strong, thin to medium bedded, grey to dark grey, fine grained SILICEOUS LIMESTONE. Fresh. INSTALLATION REMARKS B/11/08-69/Ahrs Unload studge tanks, load & erect fencing, dig aspection pit (widened due to pipe) and move equipment onto ocalion. REMARKS Date Tip Depth RZ Top RZ Base Type 19-11-08 8,00 4,50 8,00 50mm SP | 27 | | | | | | | | | moderat bedded, calcareo Fresh Strong to strong, ti bedded, grained ARGILL LIMEST interbedd timeston | ely weak, thi black, us SHALE. o moderately hin to mediu dark grey, fin ACEOUS ONE with ded siliceous e. Fresh. | m ne | | and plar sub-10° Disconti and plar | nar. Dips are nuities are s nar. Dips are | mooth | | | |
| grained SILIČEOUS LIMESTONE. Fresh. INSTALLATION REMARKS B/11/08- 63/hrs Unload sludge tanks, load & erect fencing, dig spection pit (widened due to pipe) and move equipment onto ocation. GROUNDWATER DETAILS Date Hole Depth Depth Water Comments NSTALLATION DETAILS Date Tip Depth RZ Top RZ Base Type 19-11-08 8.00 4.50 8.00 50mm SP | | | 100 | 97 | 87 | | | | | moderat bedded, calcareo Fresh Strong to strong, ti bedded, grained ARGILL LIMEST | ely weak, thi black, our SHALE. o moderately hin to mediu dark grey, fir ACEOUS ONE. Fresh o very strong sedium bedde | m ne | | and plar sub-10° Disconti and plar sub-10° Disconti to slightle | nuities are s nuities are s nar. Dips an nuities are s y rough and | mooth e | | | |
| 8/11/08- 63/hrs Unload sludge tanks, load & erect fencing, dig aspection pit (widened due to pipe) and move equipment onto ocation. GROUNDWATER DETAILS Date Hole Depth Depth | | | | | | | | 崩 | | grained : | SILIČEOUS ONE. Fresh | | | | Jipo are sub | . 10 . | | | |
| Comments | 8/1 | 1/08 | - 6¾ | | | | | | | | INSTALLA | TION | REMA | RKS | | | | | |
| Date Hole Casing Depth Water Comments | | | Α | , | | o pi | y 11N | | | | GROUNDY | VATE | R DET | AILS | | | | | |
| NSTALLATION DETAILS | | | | | | | | | | | | Н | ole | Casing | Depth to Water | Comm | ents | | |
| Date Tip Depth RZ Top RZ Base Type 19-11-08 8.00 4.50 8.00 50mm SP | | rai i | ΔΤΜ | ם ער | ET^ | 11 Q | | | | | | | | | | | | | |
| 19-11-08 8.00 4.50 8.00 50mm SP | _ | _ | - | - | - | | RZ Base | | уре | | | | | | | | | | |
| 19-11-08 25.00 20.00 25.00 50mm SP | 19- | 11-0 | В | | | | | 50n | ım S | P | | | | | | | | | |



| <u>\</u> | 38 | | | | | | | | | | bl | PB 11.1 | 101 = 111 | | 136 | | | |
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| CO | NTR | ACT | | ublin | Central Developm | ent - Dra | aft | | | | | DRILL | HOLE NO | ס | RC16 Sheet | 15 of 15 | | |
| co | -ORI | INAT | ΓES(| _) | | | | | OUND LEVEL (m) RE DIAMETER (mm) 102 | | | DATE | STARTE | | 18/11/2008 | | | |
| CLI | ENT | | D | ublin | Central Developm | ents Ltd | It | NCLINATIO | ON | - | 90 | DRILL | ED BY | | 19/11/ Millenr | 2008 nium | | |
| _ | GINE | ER | Α | GL C | onsulting Ltd | | F | FLUSH Polymer Gel | | | | | ED BY | | A. Mal | A. Mahony | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) 0 ²⁵⁰ 500 | Legend | Non-intact zones (shaded) | De | scription | Depth (m) | Disc | continuities | | Elevation | Standpipe Details | SPT (N Value) | | |
| 28 | | | | | | | | | | 28.10 | | | | | | | | |
| | 28.10 | | | | | | | strong, t bedded, grained ARGILL | o moderately hin to medium dark grey, fine ACEOUS ONE. Fresh. | 28.48 | | nuities are s ar. Dips are | | | | | | |
| | | | | | | | | moderat bedded, calcared Fresh | us SHALE. | 28.70 | and plan sub-10°. | | | | | | | |
| | | 100 | 86 | 74 | | | | grey to o | o very strong, nedium bedded, dark grey, fine SILICEOUS ONE. Fresh. | | to slightly | nuities are s y rough and Dips are sub | | | | | | |
| 29 | | | | | | | | | | 29.25 | | | | | | | | |
| | | | | | | | | strong, t bedded, grained ARGILL | | 29.25 | | nuities are s ar. Dips are | | | | | | |
| | 29.80 | | | | | H | | End of C | Corehole at 29.8 | 29.80 | | | | | | | | |
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| | | | | | | | | | GROUNDWAT | Hole | Casing | Depth to | Commi | anto | | | | |
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| | TAL | LATIC | ON D | ETA | ILS | | _ | | | | | | | | | | | |
| | Date | | _ | _ | RZ Top RZ Base | | Туре | | | | | | | | | | | |
| 10 | -11-0 | 8 | 8.00 25.0 | | 4.50 8.00 20.00 25.00 | | mm S mm S | | | | | | | | | | | |





STANDARD OPERATING PROCEDURE

SOIL SAMPLING

The soil sampling technique described below will be followed to ensure that soil samples are representative of the environment which they are intended to characterise.

1.0 SAMPLING

- (A) Locate the soil sampling station in accordance with the workplan which will specify the number and type of samples to be taken. Place a wooden stake into the ground one metre from the sample location and record sample location on the stake.
- (B) Record the location in the field logbook and, if possible, photograph the location.
- (C) Collect soil samples from the depth specified in the workplan and record the depth in the field notebook. Describe the colour and texture of each sample and record in notebook.
- (D) Wear appropriate level of protection when taking samples (gloves, safety glasses, hard hat etc.) as specified in the workplan. Collect soil samples as specified in the workplan using decontaminated stainless steel trowel, soil corer, or similar device. Collect discrete soil samples from each station.
- (E) If required by the workplan, composite discreet soil samples by placing equal volumes of soil into the container and mixing thoroughly to a homogenous mixture. Samples may be hand picked, if necessary, to remove larger materials, such as leaves, sticks, gravel, rocks etc., if specified in the workplan. Record in notebook the nature of any materials removed from soil samples.
- (F) Deposit each soil sampled into a (clean, pre-washed) container. At the time of collection, the sample bottle will be filled to the top with soil sample.
- (G) Fill out labels with waterproof ink and attach to the sample container. The following information will be recorded on each sample label: -
 - Client/Site Name
 - Date Collected
 - Time Collected
 - Analysis
 - Preservative
 - Sample Identification Number

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- (H) Decontaminate sampling equipment as described below unless otherwise specified in the site workplan. When using stainless steel sampling equipment: -
 - wash with non-phosphate detergent in potable water,
 - rinse sequentially in potable water, methanol, acetone, methanol and D1 water and:
 - allow to air dry in a containment free area.
- (I) Wrap the decontaminated sampling equipment in aluminium foil which has been decontaminated in accordance with Section H.

2.0 FIELD DOCUMENTATION

Record sample information in the field notebook. Provide a complete description of the sample location, and a photograph, if necessary. Describe the soil appearance, especially if the presence of oil or an odour is noted. Document the sample bottle lot numbers in the field notebook. Record weather conditions at the time of sampling. The Field Team Leader will initial the logbook entries for correctness.

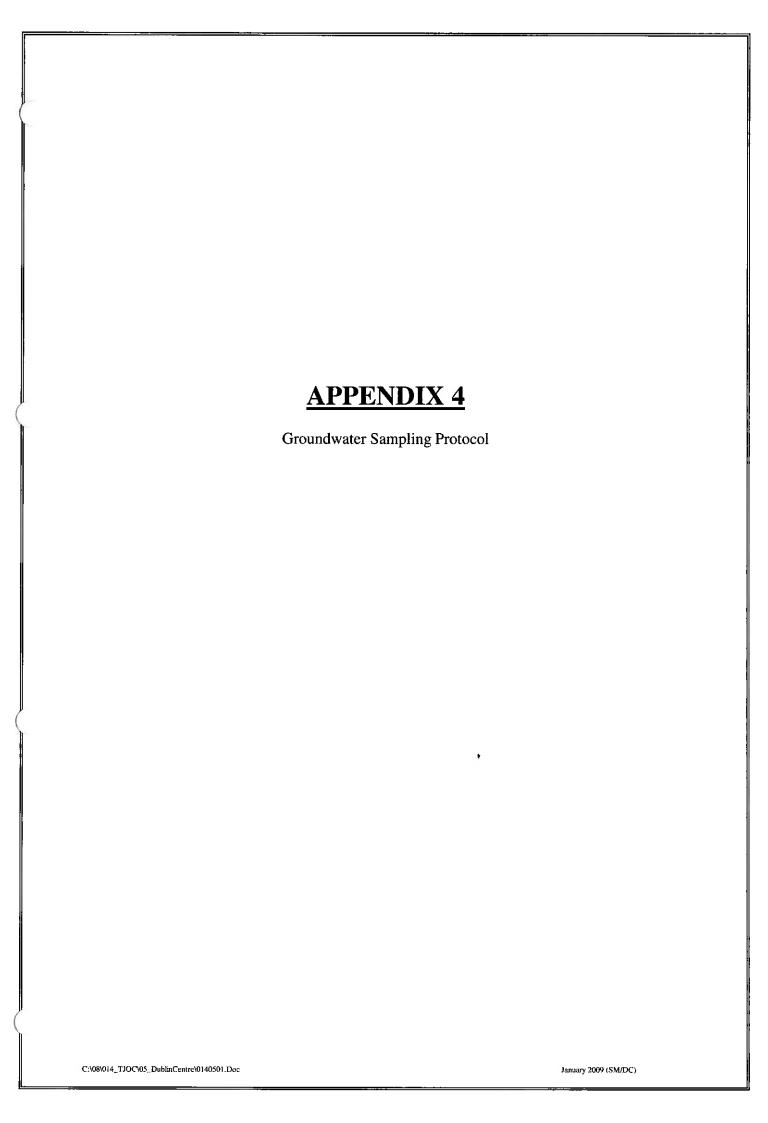
3.0 FIELD QA/QC SAMPLES

See the separate SOP on Field QA/QC samples for appropriateness and preparation of D1 Water Field Blanks, Cross-contamination Field Blanks, Trip Blanks and Field Duplicate Samples.

4.0 PACKAGING AND TRANSPORT

Check to be sure that all necessary information is on the sample container label. Complete the chain-of custody form. Package, label and transport the samples to the testing laboratory in accordance with requirements for packing, shipping and labelling environmental samples.

END.





STANDARD OPERATING PROCEDURE

GROUNDWATER SAMPLING

The primary objective of groundwater sampling is to evaluate whether the potential contaminant sources at a site have impacted the quality of the groundwater in the underlying aquifer. The additional objective is to measure hydraulic gradient, or slope, of the water table in the shallow aquifer in an effort to evaluate the direction of groundwater flow.

The purpose of this procedure is to ensure that representative samples of groundwater are collected and documented using consistent methods to ensure sample integrity.

1.0 SAMPLING PROCEDURES

1.1 Well Operating and Purging Procedures

All groundwater sampling will be conducted after the installed and developed wells have been allowed to equilibrate for at least 2 to 3 days. A Field Data Sheet for Well Sampling will be completed for each well.

Groundwater sampling teams will use to following procedure for approaching, opening, purging and sampling all wells unless directed otherwise by the workplan.

- 1) Prior to placing any equipment into the well, decontaminate the sampling equipment according to standard decontamination protocol.
- 2) Approach the well with a working FID/PID, a well key, and a depth-to-water meter.
- 3) Unlock and open the well cap just enough to insert the probe of the PID/FID. Take and record a reading. A decision to upgrade PPE may be necessary based on the FID/PID readings in the breathing zone.
- 4) Where practical, the surface water column will be visually examined for the presence of hydrocarbons, if present or suspected, the thickness of the hydrocarbon layer will be measured using an oil/water interface probe prior to taking the depth-to-water measurement.
- 5) Insert the water level probe into the well and measure and record the static water level to the nearest 0.01 m with respect to the established survey point on top of the well casing.

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- 6) Decontaminate the water level probe with DDI water (Do not rinse with any solvents unless product was encountered).
- 7) Calculate and record the minimum volume of water to be purged according to the following conversion factors: -

| 1 well volume | = | water column in metres x litres/linear metre |
|---------------|---|--|
| 2 inch casing | = | 2.0 LPM |
| 4 inch casing | = | 8.1 LPM |
| 6 inch casing | = | 18.2 LPM |
| 8 inch casing | = | 32.4 LPM |

- Purge the well of at least 3 casing volumes by pumping using a peristaltic pump with flow controller or bailing with a decontaminated submersible pump or PVC bailer equipped with a bottom filling check valve (if the purge volume is low, generally less than 100 litres, the sampling team might find it more efficient to purge with a bailer than a pump). Use a graduated bucket to track the amount of water removed from the well. The determination of purging and sampling will depend on parameters being analysed. Where VOCs or SVOCs are required it is recommended that slow purging using peristaltic pumping be undertaken. Periodically determine the pH, temperature and specific conductance of the purged water. Continue purging until the well has been completely evacuated or until the pH and specific conductance measurements have stabilised for at least one well volume. Wells that become dewatered prior to producing three casing volumes will be sampled as soon as practical once they recover sufficiently.
- 9) Dispose of purge water collected in the graduated bucket by dumping onto the ground at a distance of 50 to 60 metres from the vicinity of the well. If the water is known or suspected to be significantly contaminated, it may be necessary to store the purge water in a secure container, such as a drum, pending proper disposal.
- 10) Be aware and record any unusual occurrence during purging such as cascading (a shallow water entry zone that trickles into the borehole).

1.2 Field Parameter Measurement

Measurements of field parameters of pH, temperature and electrical conductivity are collected and organic vapour screening is conducted while the well is purged. To facilitate the collection of basic field parameters, the field team needs to: -

- Purge three well volumes of water from the well and measure field parameters for each well volume removed.
- Collection of water samples should take place after stabilisation of the following parameters: -
 - Temperature ⁺/- 1°C
 - pH (meter or paper) +/- 0.2 units
 - Specific conductivity */- 5%

- If the aforementioned parameters do not stabilise within three purge volumes, the well will be purged up to a maximum of six borehole volumes unless two consecutive sets of stabilised parameters are obtained.
- Note any observations in the field logbook.

1.3 <u>Collection of Water Samples</u>

All samples or chemical analysis will be placed in laboratory prepared bottles. The types of sample containers and preservative required for each type of analysis are described in the workplan. Where product layers are present a procedure and rational for the collection of such layers should be outlined in the site specific work plan. If required, preservatives will be placed in the sample containers prior to collecting the samples.

The following procedure will be used to sample a well: -

- 1) After the well has been purged and allowed to recover, sample the well using a properly decontaminated or dedicated disposable bailer. Gently lower the bailer into the water column. Allow the bailer to sink and fill with a minimum of surface disturbance.
- 2) Slowly raise the bailer out of the well. Do not allow the bailer line to contact the ground, either by coiling it on a clean plastic sheet or by looping it from arm to arm as the line is extracted from the well.
- 3) Samples will be collected for VOCs analysis immediately after purging is complete and before other samples are collected. Pour the samples slowly into the laboratory prepared 40 ml glass vial. Overfill each vial slightly to eliminate air bubbles, a convex meniscus should be present at the top of the vial. Ensure that the Teflon liner of the septum cap is facing inward and that no bubbles are entrapped. After capping securely, turn bottle upside-down, tap it against your other hand, and observe sample water for bubbles. If bubbles are observed, remove the cap, overfill the vial and reseal. Repeat this step for each vial until the samples with no bubbles are obtained.
- 4) Place a label on the container and enter the following information: -

Client/Site Name
Date Collected
Time Collected
Analysis
Preservative
Sample Identification Number

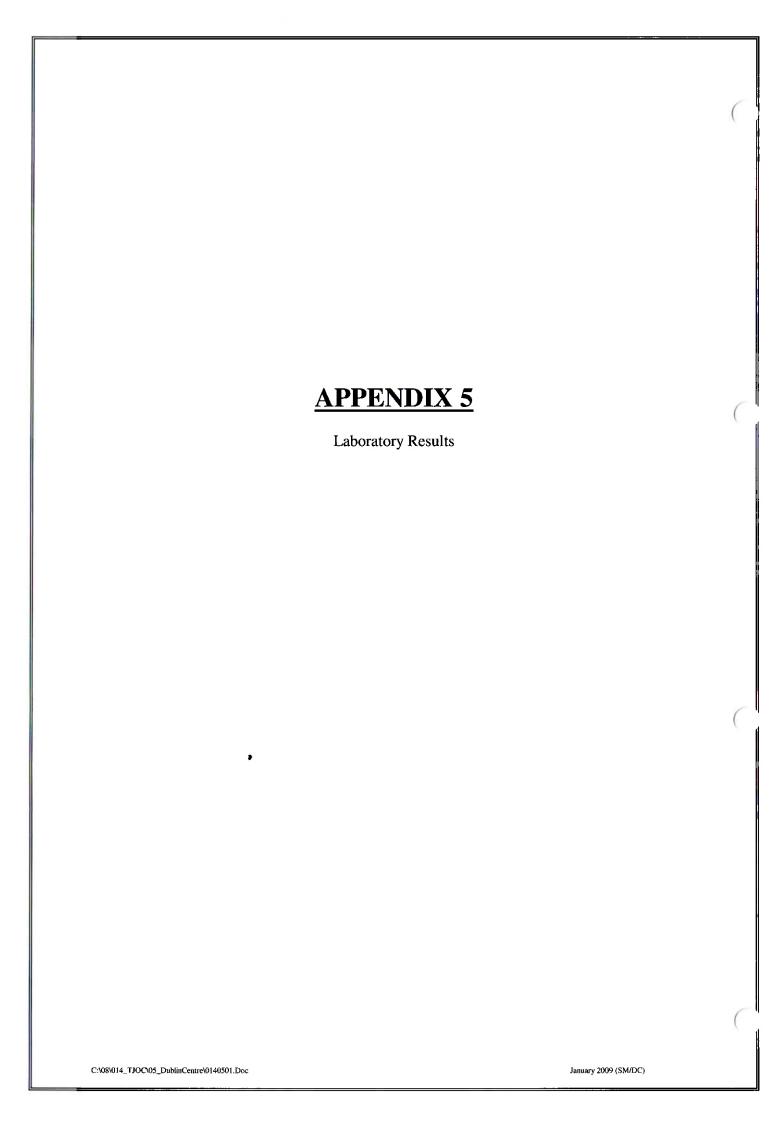
- 5) Record pertinent information in the field logbook and on the Field Data Sheet for Well Sampling. Complete chain-of-custody form.
- 6) Place custody seals on the container caps. As soon as possible, place sample containers in a cooler with bagged ice and maintain at 4°C until extraction. Surround the bottles with vermiculite.

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- 7) Obtain the semi-volatile compound/pesticides/PCBs sample(s) by transferring the water to a laboratory prepared 1000 ml amber glass bottle with Teflon-lined cap. Fill the bottle to the bottom of the neck and follow steps 4, 5 and 6 above.
- 8) Dissolved metals (if necessary) requires the team to filter the sample water through a .45 micron filter. The water is collected in a 1 litre, unpreserved, plastic or glass bottle with HNO₃ preservative. Filtering must be done within 15 minutes of sample collection.
- 9) Obtain the total metals sample by directly transferring the water from the bailer into a laboratory prepared 1000 ml plastic or glass bottle with HNO₃ preservative.
- 10) Be sure the pH of the metals sampled is less than 2 by pouring off an aliquot in a clean jar and testing for pH using litmus paper. Dispose of this water and rinse the jar.
- 11) Collect and prepare Field QA/QC samples in accordance with separate SOP.
- 12) Be sure to record all data required on the Field Data Sheet or Well Sampling and appropriate entries into the field logbook.
- 13) Secure the well cap and replace the locking cover.
- 14) Decontaminate all sampling equipment according to procedure.
- 15) Decontaminate submersible pumps as follows: -

Scrub pump and cord in a tub of Liquinox/or similar and potable water Pump at least 80 litres of soapy water through pump Rinse with potable water Pump at least 80 litres of rinse water through the pump Rinse with D1 water before lowering pump into the next well.

END.





Mr Crean O Callaghan Moran & Assoc. Granary House Rutland Street Cork

14 August 2008

Test Report: MID/538002/2008

Dear Mr Crean

Analysis of your sample(s) submitted on 11 August 2008 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7658 4800 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using STL and we look forward to receiving your next samples.

Yours Sincerely,

Signed: X. Ellas

Name: L. Ellis

Title: Team Leader

STL Midlands

Tel: +44 (0)24 7658 4800

Rayner House, 80 Lockhurst Lane, Coventry, CV6 5PZ

Fax: +44 (0)24 7658 4848

www.stl-ltd.com

Severn Trent Laboratories Limited

Registered in England & Wales Registration No. 2148934 Registered Office: 2297 Coventry Road, Birmingham B26









Report Summary





Mr Donal Crean O Callaghan Moran & Assoc. **Granary House** Rutland Street Cork

Date of Issue:

14 August 2008

Report Number: MID/538002/2008

Issue

Job Description:

Donal Crean

Number of Samples included in this report 3 Job Received:

11 August 2008

Number of Test Results included in this report 117

Analysis Commenced: 11 August 2008

Name: L. Ellis

Date: 14 August 2008

Signed: X. Ellis

Title:

Team Leader

STL was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.





Report Number:

MID/538002/2008

Laboratory Number: 10715372

Issue

Sample 1 of 3

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH7 0.50m-1.00m

Sample Date:

Sample Received

11 August 2008

Analysis Complete:

14 August 2008

| Test Description | Result | Units | Accreditation | Method |
|-----------------------------|--------|-------|---------------|--------|
| Antimony as Sb, dry weight | 1.6 | mg/kg | Y Mid | 30C |
| Arsenic as As, dry weight | 16 | mg/kg | Y Mid | 30/30C |
| Barium as Ba, dry weight | 150 | mg/kg | Y Mid | 30 |
| Cadmium as Cd, dry weight | 0.65 | mg/kg | Y Mid | 30 |
| Chromium as Cr, dry weight | 11 | mg/kg | Y Mid | 30 |
| Copper as Cu, dry weight | 19 | mg/kg | Y Mid | 30 |
| ron as Fe, dry weight | 8900 | mg/kg | Y Mid | 30 |
| Lead as Pb, dry weight | 42 | mg/kg | Y Mid | 30 |
| Manganese as Mn, dry weight | 830 | mg/kg | Y Mid | 30 |
| Mercury as Hg, dry weight | <0.25 | mg/kg | Y Mid | 30C |
| Nickel as Ni, dry weight | 24 | mg/kg | Y Mid | 30 |
| Tin as Sn,dry weight | <2.0 | mg/kg | Y Mid | 30 |
| Zinc as Zn, dry weight | 68 | mg/kg | Y Mid | 30 |
| TPH >C6 - C10 | <50 | mg/kg | Y Mid | 317 |
| TPH >C10 - C20 | <50 | mg/kg | Y Mid | 317 |
| ΓPH >C20 - C40 | 180 | mg/kg | Y Mid | 317 |
| FPH >C6 - C40, Total | 180 | mg/kg | Y Mid | 317 |
| naphthalene | 0.80 | mg/kg | Y Mid | 307 |
| acenaphthylene | <0.10 | mg/kg | Y Mid | 307 |
| acenaphthene | 0.48 | mg/kg | Y Mid | 307 |
| luorene | 0.32 | mg/kg | Y Mid | 307 |
| phenanthrene | 4.0 | mg/kg | Y Mid | 307 |
| anthracene . | 0.92 | mg/kg | Y Mid | 307 |
| luoranthene | 4.0 | mg/kg | Y Mid | 307 |
| ругепе | 3.7 | mg/kg | Y Mid | 307 |
| penzo(a)anthracene | 1.7 | mg/kg | Y Mid | 307 |
| chrysene | 1.6 | mg/kg | Y Mid | 307 |
| penzo(b)fluoranthene | 1.4 | mg/kg | Y Mid | 307 |
| enzo(k)fluoranthene | 0.70 | mg/kg | Y Mid | 307 |
| enzo(a)pyrene | 1,6 | mg/kg | Y Mid | 307 |
| Dibenz(a,h)anthracene | 0.17 | mg/kg | Y Mid | 307 |
| Benzo(g,h,i)perylene | 1.1 | mg/kg | Y Mid | 307 |
| ndeno(1,2,3-c,d)pyrene | 0.83 | mg/kg | Y Mid | 307 |
| PAH, Total of 16 EPA | 23 | mg/kg | Y Mid | 307 |
| penzene | <0.10 | mg/kg | Y Mid | 327 |





Report Number: MID/538002/2008 Issue

Laboratory Number: 10715372

Sample 1 of 3

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH7 0.50m-1.00m

Sample Date: Sample Received 11 August 2008 Analysis Complete: 14 August 2008

| Test Description | Result <0.10 | Units mg/kg | Accreditation | | Method |
|------------------|-----------------|----------------|---------------|-----|--------|
| toluene | | | Y | Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y | Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y | Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y | Mid | 327 |

Analyst Comments for 10715372:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcom.
For Microbiological determinands 0 or NO=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample





Report Number: MID/538002/2008

Laboratory Number: 10715373

Issue

Sample 2

Sample Source:

O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH9 0.50m-1.00m

Sample Date:

Sample Received

11 August 2008

Analysis Complete:

14 August 2008

| Campie Date. | oumpio modernou | i i nagaot 200 | , alalyono o | J () | 9 |
|-----------------------------|-----------------|----------------|--------------|---------------|--------|
| Test Description | | Result | Units | Accreditation | Method |
| Antimony as Sb, dry weight | | 1.6 | mg/kg | Y Mid | 30C |
| Arsenic as As, dry weight | | 12 | mg/kg | Y Mid | 30/30C |
| Barium as Ba, dry weight | | 72 | mg/kg | Y Mid | 30 |
| Cadmium as Cd, dry weight | | 1.2 | mg/kg | Y Mid | 30 |
| Chromium as Cr, dry weight | | 14 | mg/kg | Y Mid | 30 |
| Copper as Cu, dry weight | | 28 | mg/kg | Y Mid | 30 |
| Iron as Fe, dry weight | | 20000 | mg/kg | Y Mid | 30 |
| Lead as Pb, dry weight | | 79 | mg/kg | Y Mid | 30 |
| Manganese as Mn, dry weight | | 1100 | mg/kg | Y Mid | 30 |
| Mercury as Hg, dry weight | | 0.34 | mg/kg | Y Mid | 30C |
| Nickel as Ni, dry weight | | 31 | mg/kg | Y Mid | 30 |
| Tin as Sn,dry weight | | 3.5 | mg/kg | Y Mid | 30 |
| Zinc as Zn, dry weight | | 86 | mg/kg | Y Mid | 30 |
| TPH >C6 - C10 | | <50 | mg/kg | Y Mid | 317 |
| TPH >C10 - C20 | | <50 | mg/kg | Y Mid | 317 |
| TPH >C20 - C40 | | 150 | mg/kg | Y Mid | 317 |
| TPH >C6 - C40, Total | | 150 | mg/kg | Y Mid | 317 |
| naphthalene | | 0.24 | mg/kg | Y Mid | 307 |
| acenaphthylene | | <0.10 | mg/kg | Y Mid | 307 |
| acenaphthene | | <0.10 | mg/kg | Y Mid | 307 |
| fluorene | | <0.10 | mg/kg | Y Mid | 307 |
| phenanthrene | | 0.62 | mg/kg | Y Mid | 307 |
| anthracene | | 0.13 | mg/kg | Y Mid | 307 |
| fluoranthene | | 0.63 | mg/kg | Y Mid | 307 |
| pyrene | | 0.51 | mg/kg | Y Mid | 307 |
| benzo(a)anthracene | | 0.27 | mg/kg | Y Mid | 307 |
| chrysene | | 0.26 | mg/kg | Y Mid | 307 |
| benzo(b)fluoranthene | | 0.25 | mg/kg | Y Mid | 307 |
| benzo(k)fluoranthene | | 0.13 | mg/kg | Y Mid | 307 |
| benzo(a)pyrene | | 0.25 | mg/kg | Y Mid | 307 |
| Dibenz(a,h)anthracene | | <0.10 | mg/kg | Y Mid | 307 |
| Benzo(g,h,i)perylene | | 0.25 | mg/kg | Y Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | | 0.22 | mg/kg | Y Mid | 307 |
| PAH, Total of 16 EPA | | 3.7 | mg/kg | Y Mid | 307 |
| benzene | | <0.10 | mg/kg | Y Mid | 327 |





Report Number: MID/538002/2008 Issue

Laboratory Number: 10715373

Sample 2 of 3

O Callaghan Moran & Assoc. Sample Source: Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH9 0.50m-1.00m

Sample Received 14 August 2008 Sample Date: 11 August 2008 Analysis Complete:

| Test Description | Result | Units | Accreditation | Method |
|------------------|--------|-------|---------------|--------|
| toluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |

Analyst Comments for 10715373:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionalia ND=Not Detected in volume of sample filtered. VS=Insufficient sample





Report Number: MID/538002/2008

Issue

Sample 3

Laboratory Number: 10715374

Sample Source: Sample Point Description: O Callaghan Moran & Assoc.

O Callaghan Moran & Assoc.

Sample Description:

Sample Date:

BH10 1.70m-2.50m

Sample Received

11 August 2008 Analysis Complete:

14 August 2008

| | aguot zot | | | -9 |
|-----------------------------|-----------|-------|---------------|--------|
| Test Description | Result | Units | Accreditation | Method |
| Antimony as Sb, dry weight | 1.7 | mg/kg | Y Mid | 30C |
| Arsenic as As, dry weight | 13 | mg/kg | Y Mid | 30/30C |
| Barium as Ba, dry weight | 79 | mg/kg | Y Mid | 30 |
| Cadmium as Cd, dry weight | 1.6 | mg/kg | Y Mid | 30 |
| Chromium as Cr, dry weight | 14 | mg/kg | Y Mid | 30 |
| Copper as Cu, dry weight | 30 | mg/kg | Y Mid | 30 |
| Iron as Fe, dry weight | 25000 | mg/kg | Y Mid | 30 |
| Lead as Pb, dry weight | 59 | mg/kg | Y Mid | 30 |
| Manganese as Mn, dry weight | 1500 | mg/kg | Y Mid | 30 |
| Mercury as Hg, dry weight | <0.25 | mg/kg | Y Mid | 30C |
| Nickel as Ni, dry weight | 37 | mg/kg | Y Mid | 30 |
| Tin as Sn,dry weight | 3.7 | mg/kg | Y Mid | 30 |
| Zinc as Zn, dry weight | 94 | mg/kg | Y Mid | 30 |
| TPH >C6 - C10 | <50 | mg/kg | Y Mid | 317 |
| TPH >C10 - C20 | <50 | mg/kg | Y Mid | 317 |
| TPH >C20 - C40 | <50 | mg/kg | Y Mid | 317 |
| TPH >C6 - C40, Total | <50 | mg/kg | Y Mid | 317 |
| naphthalene | <0.10 | mg/kg | Y Mid | 307 |
| acenaphthylene | <0.10 | mg/kg | Y Mid | 307 |
| acenaphthene | <0.10 | mg/kg | Y Mid | 307 |
| fluorene | <0.10 | mg/kg | Y Mid | 307 |
| phenanthrene | 0.20 | mg/kg | Y Mid | 307 |
| anthracene | <0.10 | mg/kg | Y Mid | 307 |
| fluoranthene | 0.13 | mg/kg | Y Mid | 307 |
| pyrene | <0.10 | mg/kg | Y Mid | 307 |
| penzo(a)anthracene | <0.10 | mg/kg | Y Mid | 307 |
| chrysene | <0.10 | mg/kg | Y Mid | 307 |
| benzo(b)fluoranthene | <0.10 | mg/kg | Y Mid | 307 |
| penzo(k)fluoranthene | <0.10 | mg/kg | Y Mid | 307 |
| oenzo(a)pyrene | <0.10 | mg/kg | Y Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | Y Mid | 307 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | Y Mid | 307 |
| ndeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | Y Mid | 307 |
| PAH, Total of 16 EPA | <1.0 | mg/kg | Y Mid | 307 |
| penzene | <0.10 | mg/kg | Y Mid | 327 |







Report Number:

MID/538002/2008

Issue

Laboratory Number: 10715374

Sample 3 of 3

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc. Sample Description:

BH10 1.70m-2.50m

Sample Date:

Sample Received

11 August 2008

Analysis Complete:

14 August 2008

Date: 14 August 2008

| Test Description toluene | Result <0.10 | Units mg/kg | Accreditation | Method |
|--------------------------|-----------------|----------------|---------------|--------|
| | | | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |

Analyst Comments for 10715374:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Brt = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella NO=Not Detected in volume of sample filtered. VS=Insufficient sample

Signed: X. Ellas

Name: L. Ellis

Title: Team Leader



Mr Crean O Callaghan Moran & Assoc. **Granary House** Rutland Street Cork

19 November 2008

Test Report: COV/558587/2008

Dear Mr Crean

Analysis of your sample(s) submitted on 31 October 2008 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out is included with this report.

Should you have any gueries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using STL and we look forward to receiving your next samples.

Yours Sincerely.

Signed: X. Ellis

Name: L. Ellis

Title: Team Leader

STL Coventry

Tel: +44 (0)24 7642 1213

STL Business Centre, Torrington Avenue, Coventry, CV4 9GU

Fax: +44 (0)24 7685 6575

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Severn Trent Laboratories Limited

Registered in England & Wales Registration No. 2148934 Registered Office: 2297 Coventry Road, Birmingham 926









Report Summary





Mr Donal Crean O Callaghan Moran & Assoc. **Granary House** Rutland Street Cork

Date of Issue:

19 November 2008

Report Number: COV/558587/2008

Issue

Analysis Commenced: 31 October 2008

Job Description:

Donal Crean

Job Location:

08-014-05

Number of Samples

included in this report 16

Job Received:

31 October 2008

Number of Test Results

included in this report 400

Name: L. Ellis

Date: 19 November 2008

Signed: X. Ellis

Title:

Team Leader

STL was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.





Report Number: COV/558587/2008

Laboratory Number: 10888346

Issue

of 16 Sample 1

Sample Source:

O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

Sample Date:

BH7 13.0-14.00m

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accreditation | Method | |
|--------------------------------|--------|---------|---------------|------------|--|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 | |
| Moisture Content Ratio at 105C | 1.19 | % ratio | N Mid | 33 | |
| Moisture at 105c | 1.2 | % | N Mid | 33 | |
| TOC by Ignition in O2 | 0.52 | % | N Mid | 27 | |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 | |
| Mineral Oils, >C10 - C40 | <50 | mg/kg | Y Mid | 317 | |
| Naphthalene | <0.10 | mg/kg | N Mid | 307 | |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 | |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 | |
| Fluorene | <0.10 | mg/kg | N Mid | 307 | |
| Phenanthrene | <0.10 | mg/kg | N Mid | 307 | |
| Anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 | |
| Pyrene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Chrysene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 | |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 | |
| ndeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 | |
| Coronene | <0.10 | mg/kg | N Mid | 307 | |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 | |
| benzene | <0.10 | mg/kg | Y Mid | 327 | |
| toluene | <0.10 | mg/kg | Y Mid | 327 | |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 | |
| n&p-Xylene | <0.20 | mg/kg | Y Mid | 327 | |
| p-xylene | <0.10 | mg/kg | Y Mid | 327 | |
| Dry Ratio (BSEN 12457) | 98.83 | % | N Mid | Calculated | |

Analyst Comments for 10888346:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Res = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or NO=Not Detected, For Legionalia ND=Not Detected in volume of sample filtered, I/S=insufficient sample







Report Number: COV/558587/2008 Issue 1

Sample 2 Laboratory Number: 10888347 of 16

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

BH15 0.5-1.00m Sample Description:

Analysis Complete: 13 November 2008 31 October 2008 Sample Date: Sample Received

| Test Description | Result | Units | Accreditation | Method | |
|--------------------------------|--------|---------|---------------|------------|--|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 | |
| Moisture Content Ratio at 105C | 2.13 | % ratio | N Mid | 33 | |
| Moisture at 105c | 2.1 | % | N Mid | 33 | |
| TOC by Ignition in O2 | 3.6 | % | N Mid | 27 | |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 | |
| Mineral Oils, >C10 - C40 | 120 | mg/kg | Y Mid | 317 | |
| Naphthalene | 0.20 | mg/kg | N Mid | 307 | |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 | |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 | |
| Fluorene | <0.10 | mg/kg | N Mid | 307 | |
| Phenanthrene | 0.44 | mg/kg | N Mid | 307 | |
| Anthracene | 0.10 | mg/kg | N Mid | 307 | |
| Fluoranthene | 0.50 | mg/kg | N Mid | 307 | |
| Pyrene | 0.43 | mg/kg | N Mid | 307 | |
| Benzo(a)anthracene | 0.34 | mg/kg | N Mid | 307 | |
| Chrysene | 0.63 | mg/kg | N Mid | 307 | |
| Benzo(b)fluoranthene | 0.41 | mg/kg | N Mid | 307 | |
| Benzo(k)fluoranthene | 0.21 | mg/kg | N Mid | 307 | |
| Benzo(a)pyrene | 0.39 | mg/kg | N Mid | 307 | |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(g,h,i)perylene | 0.35 | mg/kg | N Mid | 307 | |
| Indeno(1,2,3-c,d)pyrene | 0.18 | mg/kg | N Mid | 307 | |
| Coronene | <0.10 | mig/kg | N Mid | 307 | |
| PAH, Total of 17 WAC | 4.2 | mg/kg | N Mid | 307 | |
| benzene | <0.10 | mg/kg | Y Mid | 327 | |
| toluene | <0.10 | mg/kg | Y Mid | 327 | |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 | |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 | |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 | |
| Dry Ratio (BSEN 12457) | 97.91 | % | N Mid | Calculated | |

Analyst Comments for 10888347:

No Analyst Comment

Accreditation Codes; Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at; Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample





Report Number: COV/558587/2008

Issue 1

Laboratory Number: 10888348

Sample 3 of 16

Sample Source: O Callaghan Moran & Assoc.
Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH15 1.0-2.00m

Sample Date: Sample Received 31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 1.51 | % ratio | N Mid | 33 |
| Moisture at 105c | 1.5 | % | N Mid | 33 |
| TOC by Ignition in O2 | 5.2 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | 86 | mg/kg | Y Mid | 317 |
| Naphthalene | 0.16 | mg/kg | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 |
| Fluorene | <0.10 | mg/kg | N Mid | 307 |
| Phenanthrene | 0.42 | mg/kg | N Mid | 307 |
| Anthracene | <0.10 | mg/kg | N Mid | 307 |
| Fluoranthene | 0.14 | mg/kg | N Mid | 307 |
| Pyrene | 0.12 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | 0.12 | mg/kg | N Mid | 307 |
| Chrysene | 0.32 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | 0.13 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 |
| ndeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | mg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | 1.4 | mg/kg | N Mid | 307 |
| penzene | <0.10 | mg/kg | Y Mid | 327 |
| oluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| n&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| p-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Ory Ratio (BSEN 12457) | 98.51 | % | N Mid | Calculated |

Analyst Comments for 10888348:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = 3ub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = 3TL Reading, Run = STL Runcom.

For Microbiological determinands 0 or ND=Not Detected, For Legionalla NO=Not Detected in volume of sample filtered. I/S=Insufficient sample





Report Number: COV/558587/2008 Issue

Sample 4 of 16 Laboratory Number: 10888349

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH15 12.0-13.00m

31 October 2008 Analysis Complete: 13 November 2008 Sample Date: Sample Received

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|----------------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 0.79 | % ratio | N Mid | 33 |
| Moisture at 105c | 0.79 | % | N Mid | 33 |
| TOC by Ignition in O2 | 0.34 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | <50 | mg/kg | Y Mid | 317 |
| Naphthalene | <0.10 | m g/k g | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 |
| Fluorene | <0.10 | mg/kg | N Mid | 307 |
| Phenanthrene | <0.10 | mg/kg | N Mid | 307 |
| Anthracene | <0.10 | mg/kg | N Mid | 307 |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Pyrene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Chrysene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 |
| ndeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | mg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 |
| penzene | <0.10 | mg/kg | Y Mid | 327 |
| oluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Dry Ratio (BSEN 12457) | 99.21 | % | N Mid | Calculated |

Analyst Comments for 10888349:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn,
For Microbiological determinands 0 or ND=Not Detected, For Legionalla ND=Not Detected in volume of sample filtered, I/S=Insufficient sample





Report Number: COV/558587/2008

Issue

Sample 5 of 16

Laboratory Number: 10888350

Sample Source: Sample Point Description: O Callaghan Moran & Assoc.

O Callaghan Moran & Assoc.

Sample Description:

W2 0.50-1.00m

Sample Date:

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 0.99 | % ratio | N Mid | 33 |
| Moisture at 105c | 0.98 | % | N Mid | 33 |
| TOC by Ignition in O2 | 5.6 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | 150 | mg/kg | Y Mid | 317 |
| Naphthalene | 5.5 | mg/kg | N Mid | 307 |
| Acenaphthylene | 0.11 | mg/kg | N Mid | 307 |
| Acenaphthene | 7.1 | mg/kg | N Mid | 307 |
| Fluorene | 4.4 | mg/kg | N Mid | 307 |
| Phenanthrene | 40 | mg/kg | N Mid | 307 |
| Anthracene | 13 | mg/kg | N Mid | 307 |
| Fluoranthene | 38 | mg/kg | N Mid | 307 |
| Pyrene | 34 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | 18 | mg/kg | N Mid | 307 |
| Chrysene | 17 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | 14 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | 7.7 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | 19 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | 1.1 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | 6.9 | mg/kg | N Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | 6.9 | mg/kg | N Mid | 307 |
| Coronene | 1.5 | mg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | 230 | mg/kg | N Mid | 307 |
| benzene | <0.10 | mg/kg | Y Mid | 327 |
| oluene | <0.10 | mg/kg | Y. Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Ory Ratio (BSEN 12457) | 99.02 | % | N Mid | Calculated |

Analyst Comments for 10888350:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlends, Rea = STL Reading, Run = STL Runcom.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=insufficient sample





Report Number:

COV/558587/2008

Issue

Laboratory Number: 10888351

Sample 6 of 16

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

W2 1.00-2.00m

Sample Date:

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Sample Date. | Sample Received | 31 October 200 | A Malysis Co | Analysis Complete. 10 110 | | Veiliber 2000 | |
|--------------------------------|--|----------------|--------------|---------------------------|----------|---------------|--|
| Test Description | 100 TO 10 | Result | Units | Accred | litation | Method | |
| EN 12457-3 Leachate | | Y | | N | Mid | EN12457-3 | |
| Moisture Content Ratio at 105C | | 2.00 | % ratio | N | Mid | 33 | |
| Moisture at 105c | | 2.0 | % | N | Mid | 33 | |
| TOC by Ignition in O2 | | 5.4 | % | N | Mid | 27 | |
| PCB, Total of 7 Congeners | | <0.010 | mg/kg | N | Mid | 312 | |
| Mineral Oils, >C10 - C40 | | 5000 | mg/kg | Y | Mid | 317 | |
| Naphthalene | | 16 | mg/kg | N | Mid | 307 | |
| Acenaphthylene | | 0.29 | mg/kg | N | Mid | 307 | |
| Acenaphthene | | 16 | mg/kg | N | Mid | 307 | |
| Fluorene | | 8.1 | mg/kg | N | Mid | 307 | |
| Phenanthrene | | 97 | mg/kg | N | Mid | 307 | |
| Anthracene | | 25 | mg/kg | N | Mid | 307 | |
| Fluoranthene | | 87 | mg/kg | N | Mid | 307 | |
| Pyrene | | 88 | mg/kg | N | Mid | 307 | |
| Benzo(a)anthracene | | 44 | mg/kg | N | Mid | 307 | |
| Chrysene | | 42 | mg/kg | N | Mid | 307 | |
| Benzo(b)fluoranthene | | 3 5 | mg/kg | N | Mid | 307 | |
| Benzo(k)fluoranthene | | 19 | mg/kg | N | Mid | 307 | |
| Benzo(a)pyrene | | 47 | mg/kg | N | Mid | 307 | |
| Dibenz(a,h)anthracene | | 3.0 | mg/kg | N | Mid | 307 | |
| Benzo(g,h,i)perylene | | 20 | mg/kg | N | Mid | 307 | |
| Indeno(1,2,3-c,d)pyrene | | 18 | mg/kg | N | Mid | 307 | |
| Coronene | | 4.0 | mg/kg | N | Mid | 307 | |
| PAH, Total of 17 WAC | | 570 | mg/kg | N | Mid | 307 | |
| benzene | | <0.10 | mg/kg | Y | Mid | 327 | |
| toluene | | <0.10 | mg/kg | Y | Mid | 32 7 | |
| ethylbenzene | | <0.10 | mg/kg | Y | Mid | 327 | |
| m&p-Xylene | | <0.20 | mg/kg | Y | Mid | 327 | |
| o-xylene | | <0.10 | mg/kg | Y | Mid | 327 | |
| Dry Ratio (BSEN 12457) | | 98.04 | % | N | Mid | Calculated | |

Analyst Comments for 10888351:

{/*}TPH soils: detection limits raised due to original sample being over-range.{*/}

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionalia ND=Not Detected in volume of sample filtered. I/S=insufficient sample





Report Number: COV/558587/2008

Issue 1

Sample 7

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Laboratory Number: 10888352

Sample Description:

BH8 0.50-1.00m

Sample Date:

Sample Received

31 October 2008

Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accred | itation | Method |
|--------------------------------|--------|---------|--------|---------|------------|
| EN 12457-3 Leachate | Kesuit | Units | N | Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 2.38 | % ratio | N | Mid | 33 |
| Moisture at 105c | 2.30 | % Tatio | l N | Mid | 33 |
| TOC by Ignition in O2 | 3.1 | % | l N | Mid | 27 |
| PCB, Total of 7 Congeners | 0.028 | mg/kg | N N | Mid | 312 |
| Mineral Oils, >C10 - C40 | 510 | mg/kg | '\ Y | Mid | 317 |
| Naphthalene | 1.3 | 1 | N | Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | 1 | Mid | 307 |
| · · | | mg/kg | N | | |
| Acenaphthene | 0.56 | mg/kg | N | Mid | 307 |
| Fluorene | 1.3 | mg/kg | N | Mid | 307 |
| Phenanthrene | 5.3 | mg/kg | N | Mid | 307 |
| Anthracene | 1.7 | mg/kg | N | Mid | 307 |
| Fluoranthene | 8.4 | mg/kg | N | Mid | 307 |
| Pyrene | 6.4 | mg/kg | N | Mid | 307 |
| Benzo(a)anthracene | 3.8 | mg/kg | N | Mid | 307 |
| Chrysene | 3.4 | mg/kg | N | Mid | 307 |
| Benzo(b)fluoranthene | 2.9 | mg/kg | N | Mid | 307 |
| Benzo(k)fluoranthene | 1.6 | mg/kg | N | Mid | 307 |
| Benzo(a)pyrene | 3.8 | mg/kg | N | Mid | 307 |
| Dibenz(a,h)anthracene | 0.23 | mg/kg | N | Mid | 307 |
| Benzo(g,h,i)perylene | 1.4 | mg/kg | N | Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | 1.3 | mg/kg | N | Mid | 307 |
| Coronene | 0.52 | mg/kg | N | Mid | 307 |
| PAH, Total of 17 WAC | 44 | mg/kg | N | Mid | 307 |
| benzene | <0.10 | mg/kg | Y | Mid | 327 |
| toluene | <0.10 | mg/kg | Y | Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y | Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y | Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y | Mid | 327 |
| Dry Ratio (BSEN 12457) | 97.67 | % | N | Mid | Calculated |

Analyst Comments for 10888352:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed al: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcom.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample







Report Number:

COV/558587/2008

Issue

Laboratory Number: 10888353

Sample 8 of 16

Sample Source: Sample Point Description: O Callaghan Moran & Assoc.

O Callaghan Moran & Assoc.

Sample Description:

BH8 1.00-2.00m

Sample Date:

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Cample Date. | Sample Received | 31 October 200 | Analysis Co | ripiete. | 13 140 | Veniber 2006 |
|--------------------------------|-----------------|----------------|-------------|----------|----------|--------------|
| Test Description | | Result | Units | Accred | litation | Method |
| EN 12457-3 Leachate | | Y | | N | Mid | EN12457-3 |
| Moisture Content Ratio at 105C | | 1.50 | % ratio | N | Mid | 33 |
| Moisture at 105c | | 1.5 | % | N | Mid | 33 |
| TOC by Ignition in O2 | | 3.0 | % | N | Mid | 27 |
| PCB, Total of 7 Congeners | | <0.010 | mg/kg | N | Mid | 312 |
| Mineral Oils, >C10 - C40 | | 1800 | mg/kg | Y | Mid | 317 |
| Naphthalene | | 11 | mg/kg | N | Mid | 307 |
| Acenaphthylene | | <0.10 | mg/kg | N | Mid | 307 |
| Acenaphthene | | 3.3 | mg/kg | N | Mid | 307 |
| Fluorene | | 4.6 | mg/kg | N | Mid | 307 |
| Phenanthrene | | 33 | mg/kg | N | Mid | 307 |
| Anthracene | | 13 | mg/kg | N | Mid | 307 |
| Fluoranthene | | 52 | mg/kg | N | Mid | 307 |
| Pyrene | | 43 | mg/kg | N | Mid | 307 |
| Benzo(a)anthracene | | 23 | mg/kg | N | Mid | 307 |
| Chrysene | | 21 | mg/kg | N | Mid | 307 |
| Benzo(b)fluoranthene | | 16 | mg/kg | N | Mid | 307 |
| Benzo(k)fluoranthene | | 9.5 | mg/kg | N | Mid | 307 |
| Benzo(a)pyrene | | 24 | mg/kg | N | Mid | 307 |
| Dibenz(a,h)anthracene | | 1.1 | mg/kg | N | Mid | 307 |
| Benzo(g,h,i)perylene | 1 | 8.7 | mg/kg | N | Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | | 9.2 | mg/kg | N | Mid | 307 |
| Coronene | . | 1.8 | mg/kg | N | Mid | 307 |
| PAH, Total of 17 WAC | | 280 | mg/kg | N | Mid | 307 |
| benzene | | <0.10 | mg/kg | Υ | Mid | 327 |
| toluene | | <0.10 | mg/kg | Y | Mid | 327 |
| ethylbenzene | | <0.10 | mg/kg | Υ | Mid | 327 |
| m&p-Xylene | | <0.20 | mg/kg | Υ | Mid | 327 |
| o-xylene | | <0.10 | mg/kg | Y | Mid | 327 |
| Dry Ratio (BSEN 12457) | | 98.53 | % | N | Mid | Calculated |

Analyst Comments for 10888353:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Brl = STL, Bridgend, Cov = STL Coventry, Mid = STL Midlends, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample





Report Number: COV/558587/2008

Issue

Sample 9 of 16

Laboratory Number: 10888354 Sample Source:

O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH7 13.0-14.00m 10:1

Sample Date:

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accre | ditation | Method |
|----------------------------|--------|--------------|-------|----------|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | m g/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | l N | Mid | 25C |
| Barium, Soluble | 0.014 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y | Mid | 56 |
| Calcium, Soluble | 12 | mg/I | Y | Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y | Mid | 53F |
| Copper, Soluble | <10 | ug/l | Y | Mid | 53F |
| Lead, Soluble | <10 | ug/l | Y | Mid | 53F |
| Mercury, Soluble | 0.38 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.0085 | mg/l | N. | Mid | 68 |
| Nickel, Soluble | <10 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Mid | 25C |
| Zinc, Soluble | <10 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | <11 | mg/l | Y | Mid | 60 |
| Chloride as Cl | 7.1 | mg/l | Y | Mid | 60 |
| Dissolved Solids | <200 | mg/l | N | Mid | 18 |
| Fluoride as F- | 0.42 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 3.9 | mg/l | Y | Mid | 41 |

Analyst Comments for 10888354:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. VS=Insufficient sample







Report Number:

COV/558587/2008

Issue

Laboratory Number: 10888355

Sample 10 of 16

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc. Sample Description:

BH15 0.5-1.00m 10:1

Sample Date:

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accred | litation | Method |
|----------------------------|--------|-------|--------|----------|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/t | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.0060 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y | Mid | 56 |
| Calcium, Soluble | 54 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | 18 | ug/l | Y | Mid | 53F |
| Copper, Soluble | 36 | ug/l | Y | Mid | 53F |
| Lead, Soluble | 42 | ug/f | Y | Mid | 53F |
| Mercury, Soluble | 0.35 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.016 | mg/l | N | Mid | 68 |
| Nickel, Soluble | 15 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Miđ | 25C |
| Zinc, Soluble | <10 | ug/l | Y | Mid | 53F |
| Phenol index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | 50 | mg/l | Y | Mid | 60 |
| Chloride as Cl | <2.5 | mg/l | Y | Mid | 60 |
| Dissolved Solids | 420 | mg/l | N | Mid | 18 |
| Fluoride as F- | 0.23 | mg/t | Y | Mid | 20 |
| TOC (Filtered) | 6.2 | mg/l | Y | Mid | 41 |

Analyst Comments for 10888355:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. VS=Insufficient sample





Report Number:

COV/558587/2008

Laboratory Number: 10888356

Issue

Sample 11 of 16

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc. Sample Description:

BH15 1.0-2.00m 10:1

Sample Date:

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accred | litation | Method |
|----------------------------|--------|-------|--------|----------|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/i | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.0055 | mg/i | Y | Mid | 54 F |
| Cadmium, Soluble | <0.10 | ug/l | Y | Mid | 56 |
| Calcium, Soluble | 26 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y | Mid | 53F |
| Copper, Soluble | 28 | ug/l | Y | Mid | 53F |
| Lead, Soluble | 43 | ug/l | Y | Mid | 53F |
| Mercury, Soluble | 0.49 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.013 | mg/i | N | Mid | 68 |
| Nickel, Soluble | 14 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Mid | 25C |
| Zinc, Soluble | 13 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | 19 | mg/l | Y | Mid | 60 |
| Chloride as Cl | <2.5 | mg/l | Y | Miď | 60 |
| Dissolved Solids | <200 | mg/l | N | Mid | 18 |
| Fluoride as F- | <0.20 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 3.6 | mg/l | Y | Mid | 41 |

Analyst Comments for 10888356:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample





Report Number: COV/558587/2008

Issue 1

Laboratory Number: 10888357

Sample 12 of 16

Sample Source: O Callaghan Moran & Assoc.
Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH15 12.0-13.00m 10:1

Sample Date:

Sample Received 31 Octob

31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accre | ditation | Method |
|----------------------------|--------|-------|-------|----------|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.017 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y | Mid | 56 |
| Calcium, Soluble | 17 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y | Mid | 53F |
| Copper, Soluble | 15 | ug/l | Y | Mid | 53F |
| Lead, Soluble | 41 | ug/l | Y | Mid | 53F |
| Mercury, Soluble | <0.30 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.0046 | mg/l | N | Mid | 68 |
| Nickel, Soluble | 14 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Mid | 25C |
| Zinc, Soluble | <10 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | 13 | mg/l | Y | Mid | 60 |
| Chloride as Cl | 10 | mg/l | Y | Mid | 60 |
| Dissolved Solids | <200 | mg/l | N | Mid | 18 |
| Fluoride as F- | 0.47 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 3.7 | mg/1 | Y | Mid | 41 |

Analyst Comments for 10888357:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri × STL Bridgend, Cov = STL Coventry, Mid = STL Midlends, Ree × STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=Insufficient sample





Report Number:

COV/558587/2008

Laboratory Number: 10888358

Issue

Sample 13 of 16

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

W2 0.50-1.00m 10:1

Sample Date:

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accreditation | Method |
|----------------------------|--------|-------|---------------|----------------|
| Leachate BSEN 10:1 extract | Y | | N Mid | EN12457-3 10:1 |
| Antimony, Soluble | 0.036 | mg/l | N Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N Mid | 25C |
| Barium, Soluble | 0.024 | mg/i | Y Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y Mid | 56 |
| Calcium, Soluble | 43 | mg/i | Y Mid | 53F |
| Chromium, Soluble | 21 | ug/l | Y Mid | 53F |
| Copper, Soluble | 34 | ug/l | Y Mid | 53F |
| Lead, Soluble | 43 | ug/i | Y Mid | 53F |
| Mercury, Soluble | <0.30 | ug/l | Y Mid | 56 |
| Molybdenum, Soluble | 0.0066 | mg/l | N Mid | 68 |
| Nickel, Soluble | 13 | ug/l | Y Mid | 53F |
| Selenium, Soluble | <6.0 | ug/i | N Mid | 25C |
| Zinc, Soluble | 11 | ug/l | Y Mid | 53F |
| Phenol Index | <0.050 | mg/l | N Mid | 32A |
| Sulphate as SO4 | 44 | mg/l | Y Mid | 60 |
| Chloride as Cl | 2.7 | mg/l | Y Mid | 60 |
| Dissolved Solids | 210 | mg/l | N Mid | 18 |
| Fluoride as F- | 0.41 | mg/l | Y Mid | 20 |
| TOC (Filtered) | 4.5 | mg/l | Y Mid | 41 |

Analyst Comments for 10888358:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlends, Res = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. I/S=insufficient sample







Report Number: COV/558587/2008

Issue 1

Laboratory Number: 10888359

Sample 14 of 16

Sample Source: O Callaghan Moran & Assoc.
Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: W2 1.00-2.00m 10:1

Sample Date: Sample Received 31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accre | ditation | Method |
|----------------------------|--------|-------|-------|----------|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.018 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y | Mid | 56 |
| Calcium, Soluble | 110 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | <100 | ug/l | Y | Mid | 53F |
| Copper, Soluble | <100 | ug/l | Y | Mid | 53F |
| Lead, Soluble | <100 | ug/l | Y | Mid | 53F |
| Mercury, Soluble | <0.30 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.0081 | mg/l | N | Mid | 68 |
| Nickel, Soluble | <100 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Mid | 25C |
| Zinc, Soluble | <100 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | 160 | mg/l | Y | Mid | 60 |
| Chloride as C! | 14 | mg/l | Y | Mid | 60 |
| Dissolved Solids | 420 | mg/l | N | Mid | 18 |
| Fluoride as F- | <0.20 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 6.0 | mg/l | Y | Mid | 41 |

Analyst Comments for 10888359:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed at: Brt = STL Bridgend, Cov = STL Coveniry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered, VS=Insufficient sample





COV/558587/2008 Report Number:

Laboratory Number: 10888360

Issue

Sample 15 of 16

Sample Source:

O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH8 0.50-1.00m 10:1

Sample Date:

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Test Description | Result | Units | Accredit | ation | Method |
|----------------------------|--------|-------|----------|-------|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.021 | mg/l | Υ | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y | Mid | 56 |
| Calcium, Soluble | 690 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | <100 | ug/l | Y | Mid | 53F |
| Copper, Soluble | <100 | ug/l | Y | Mid | 53F |
| Lead, Soluble | <100 | ug/i | Y | Mid | 53F |
| Mercury, Soluble | <0.30 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.010 | mg/l | N | Mid | 68 |
| Nickel, Soluble | <100 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Mid | 25C |
| Zinc, Soluble | <100 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | 1500 | mg/l | Y | Mid | 60 |
| Chloride as Cl | 4.3 | mg/l | Y | Mid | 60 |
| Dissolved Solids | 2400 | mg/l | N | Mid | 18 |
| Fluoride as F- | <0.20 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 5.2 | mg/l | Y | Mid | 41 |

Analyst Comments for 10888360:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered, t/S=Insufficient sample







Report Number:

COV/558587/2008

Issue 1

Sample 16 of 16

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc. Sample Description:

Laboratory Number: 10888361

BH8 1.00-2.00m 10:1

Sample Date:

Sample Received

31 October 2008 Analysis Complete: 13 November 2008

| Test Description | scription Result | | Accredita | tion Method |
|----------------------------|------------------|-------|-----------|-------------------|
| Leachate BSEN 10:1 extract | Y | Units | N M | id EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N M | id 25C |
| Arsenic, Soluble | <50 | ug/l | N M | id 25C |
| Barium, Soluble | 0.025 | mg/l | Y M | id 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y M | id 56 |
| Calcium, Soluble | 650 | mg/l | Y M | id 53F |
| Chromium, Soluble | <100 | ug/i | Y M | id 53F |
| Copper, Soluble | <100 | ug/l | Y M | id 53F |
| Lead, Soluble | <100 | ug/l | Y M | id 53F |
| Mercury, Soluble | <0.30 | ug/l | Y M | id 56 |
| Molybdenum, Soluble | 0.0095 | mg/l | N M | id 68 |
| Nickel, Soluble | <100 | ug/l | Y M | id 53F |
| Selenium, Soluble | <6.0 | ug/l | N M | id 25C |
| Zinc, Soluble | <100 | ug/l | Y M | id 53F |
| Phenol Index | <0.050 | mg/l | N M | id 32A |
| Sulphate as SO4 | 1400 | mg/l | Y M | id 60 |
| Chloride as CI | 5.8 | mg/l | Y M | id 60 |
| Dissolved Solids | 2400 | mg/l | N M | id 18 |
| Fluoride as F- | <0.20 | mg/l | Y M | id 20 |
| TOC (Filtered) | 7.3 | mg/i | Y M | id 41 |

Analyst Comments for 10888361:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed al: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample fillered, I/S=insufficient sample

Signed: X. Ellis

Name: L. Ellis

Date: 19 November 2008

Title: Team Leader



Mr Crean O Callaghan Moran & Assoc. **Granary House Rutland Street** Cork

24 December 2008

Test Report: COV/569308/2008

Dear Mr Crean

Analysis of your sample(s) submitted on 12 December 2008 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using STL and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: G. Smith

Title: Inorg and License Chem Manager

STL Coventry

Tel: +44 (0)24 7642 1213

STL Business Centre, Torrington Avenue, Coventry, CV4 9GU

Fax: +44 (0)24 7685 6575

www.stl-ltd.com

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Report Summary





Mr Donal Crean O Callaghan Moran & Assoc. **Granary House** Rutland Street

Date of Issue:

24 December 2008

Report Number: COV/569308/2008

Issue 1

Job Description:

Donal Crean

Job Location:

Signed:

Cork

O Callaghan Moran & Associates

Number of Samples

included in this report 22 Job Received:

12 December 2008

Number of Test Results

included in this report 550

Name: G. Smith

Date: 24 December 2008

Title:

Inorg and License Chem Manager

Analysis Commenced: 12 December 2008

STL was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

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Report Number: COV/569308/2008

V/569308/2008 Issue

Laboratory Number: 10956741 Sample 1 of 22

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH7 4.00m-5.00m

Sample Date: Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 0.10 | % ratio | N Mid | 33 |
| Moisture at 105c | 0.10 | % | N Mid | 33 |
| TOC by Ignition in O2 | 3.1 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | <50 | mg/kg | Y Mid | 317 |
| Naphthalene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 |
| Fluorene | <0.10 | mg/kg | N Mid | 307 |
| Phenanthrene | <0.10 | mg/kg | N Mid | 307 |
| Anthracene | <0.10 | mg/kg | N Mid | 307 |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Pyrene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Chrysene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | mg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 |
| benzene | <0.10 | mg/kg | Y Mid | 327 |
| toluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Dry Ratio (BSEN 12457) | 99.90 | % | N Mid | Calculated |

Analyst Comments for 10956741:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Ree = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml.

I/S=Insufficient sample





Report Number:

COV/569308/2008

Issue

Laboratory Number: 10956742

Sample 2

of 22

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH12 0.50m-1.00m

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Campie Date. | Campie Received | IL December 2 | oo Analysis Co | impiete. | 47 DC | Sellinel Toog |
|--------------------------------|-----------------|---------------|----------------|----------|----------|---------------|
| Test Description | THE PARTY | Result | Units | Accrec | iltation | Method |
| EN 12457-3 Leachate | | Y | | N | Mid | EN12457-3 |
| Moisture Content Ratio at 105C | | 0.39 | % ratio | N | Mid | 33 |
| Moisture at 105c | - 1 | 0.39 | % | N | Mid | 33 |
| TOC by Ignition in O2 | | 5.3 | % | N | Mid | 27 |
| PCB, Total of 7 Congeners | 1 | <0.010 | mg/kg | N. | Mid | 312 |
| Mineral Oils, >C10 - C40 | | 640 | mg/kg | Y | Mid | 317 |
| Naphthalene | | 0.47 | mg/kg | N | Mid | 307 |
| Acenaphthylene | | <0.10 | mg/kg | N | Mid | 307 |
| Acenaphthene | | 0.18 | mg/kg | N | Mid | 307 |
| Fluorene | | 0.11 | mg/kg | N | Mid | 307 |
| Phenanthrene | | 1.3 | mg/kg | N | Mid | 307 |
| Anthracene | | 0.19 | mg/kg | N | Mid | 307 |
| Fluoranthene | | 0.87 | mg/kg | N | Mid | 307 |
| Pyrene | | 1.1 | mg/kg | N | Mid | 307 |
| Benzo(a)anthracene | | 0.43 | mg/kg | N | Mid | 307 |
| Chrysene | | 0.36 | mg/kg | N | Mid | 307 |
| Benzo(b)fluoranthene | | 0.26 | mg/kg | N | Mid | 307 |
| Benzo(k)fluoranthene | | 0.15 | mg/kg | N | Mid | 307 |
| Benzo(a)pyrene | | 0.34 | mg/kg | N | Mid | 307 |
| Dibenz(a,h)anthracene | | <0.10 | mg/kg | N | Mid | 307 |
| Benzo(g,h,i)perylene | | 0.45 | mg/kg | N | Mid | 307 |
| indeno(1,2,3-c,d)pyrene | | 0.37 | mg/kg | N | Mid | 307 |
| Coronene | 1 | <0.10 | mg/kg | N | 'Mid | 307 |
| PAH, Total of 17 WAC | | 6.6 | mg/kg | N | Mid | 307 |
| benzene | | <0.10 | mg/kg | Y | Mid | 327 |
| toluene | | <0.10 | mg/kg | Y | Mid | 327 |
| ethylbenzene | | <0.10 | mg/kg | Y | Mid | 327 |
| m&p-Xylene | | <0.20 | mg/kg | Y | Mid | 327 |
| o-xylene | | <0.10 | mg/kg | Y | Mid | 327 |
| Dry Ratio (BSEN 12457) | | 99.61 | % | N | Mid | Calculated |

Analyst Comments for 10956742:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: 8ri = STL Bridgerrd, Coy = STL, Coveniry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





Report Number:

COV/569308/2008

Laboratory Number: 10956743

Issue 1

Sample 3 of 22

Sample Source:

O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH12 3.00m-4.00m

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 0.29 | % ratio | N Mid | 33 |
| Moisture at 105c | 0.29 | % | N Mid | 33 |
| TOC by Ignition in O2 | 3.0 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | 170 | mg/kg | Y Mid | 317 |
| Naphthalene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 |
| Fluorene | <0.10 | mg/kg | N Mid | 307 |
| Phenanthrene | 0.11 | mg/kg | N Mid | 307 |
| Anthracene | <0.10 | mg/kg | N Mid | 307 |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Pyrene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Chrysene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | mg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 |
| benzene | <0.10 | mg/kg | Y Mid | 327 |
| toluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| n&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Dry Ratio (BSEN 12457) | 99.71 | % | N Mid | Calculated |

Analyst Comments for 10956743:

No Analyst Comment







Report Number: COV/569308/2008 Issue

Laboratory Number: 10956744 Sample 4 of 22

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH12 4.00m-5.00m

Sample Date: Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 0.28 | % ratio | N Mid | 33 |
| Moisture at 105c | 0.28 | % | N Mid | 33 |
| TOC by Ignition in O2 | 2.4 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | 57 | mg/kg | Y Mid | 317 |
| Naphthalene | 0.15 | mg/kg | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 |
| Fluorene | <0.10 | mg/kg | N Mid | 307 |
| Phenanthrene | <0.10 | mg/kg | N Mid | 307 |
| Anthracene | <0.10 | mg/kg | N Mid | 307 |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Pyrene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Chrysene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | mg/kg | · N Mid | 307 |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 |
| benzene | <0.10 | mg/kg | Y Mid | 327 |
| toluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Dry Ratio (BSEN 12457) | 99.72 | % | N Mid | Calculated |

Analyst Comments for 10956744:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml.

IfS=Insufficient sample





Issue

Laboratory Number: 10956745 Sample 5 of 22

O Callaghan Moran & Assoc. Sample Source: Sample Point Description: O Callaghan Moran & Assoc.

COV/569308/2008

Sample Description: BH12 8.00m-10.00m

Report Number:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008 Sample Date:

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 0.37 | % ratio | N Mid | 33 |
| Moisture at 105c | 0.37 | % | N Mid | 33 |
| TOC by Ignition in O2 | 1.4 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | <50 | mg/kg | Y Mid | 317 |
| Naphthalene | 0.18 | mg/kg | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 |
| Fluorene | <0.10 | mg/kg | N Mid | 307 |
| Phenanthrene | <0.10 | mg/kg | N Mid | 307 |
| Anthracene | <0.10 | mg/kg | N Mid | 307 |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Pyrene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Chrysene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | mg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 |
| benzene | <0.10 | mg/kg | Y Mid | 327 |
| toluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Dry Ratio (BSEN 12457) | 99.63 | % | N Mid | Calculated |

Analyst Comments for 10956745:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml.

#S=Insufficient sample







COV/569308/2008 Report Number:

issue

Laboratory Number: 10956746

Sample 6 of 22

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH14 0.50m-1.00m

Sample Received 12 December 2008 Analysis Complete: 24 December 2008 Sample Date:

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 1.60 | % ratio | N Mid | 33 |
| Moisture at 105c | 1.6 | % | N Mid | 33 |
| TOC by Ignition in O2 | 4.4 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | 99 | mg/kg | Y Mid | 317 |
| Naphthalene | 0.59 | mg/kg | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | 0.25 | mg/kg | N Mid | 307 |
| Fluorene | 0.11 | mg/kg | N Mid | 307 |
| Phenanthrene | 1.6 | mg/kg | N Mid | 307 |
| Anthracene | 0.26 | mg/kg | N Mid | 307 |
| Fluoranthene | 1.1 | mg/kg | N Mid | 307 |
| Pyrene | 1.2 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | 0.60 | mg/kg | N Mid | 307 |
| Chrysene | 0.57 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | 0.45 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | 0.18 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | 0.56 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | 0.37 | mg/kg | N Mid | 307 |
| ndeno(1,2,3-c,d)pyrene | 0.26 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | ṁg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | 8.1 | mg/kg | N Mid | 307 |
| benzene | <0.10 | mg/kg | Y Mid | 327 |
| oluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| n&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| p-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Dry Ratio (BSEN 12457) | 98.43 | % | N Mid | Calculated |

Analyst Comments for 10956746:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=insufficient sample





Report Number: COV/569308/2008 Issue

Laboratory Number: 10956747

Sample 7 of 22

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH14 1.00m-2.00m

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 0.91 | % ratio | N Mid | 33 |
| Moisture at 105c | 0.90 | % | N Mid | 33 |
| TOC by Ignition in O2 | 3.8 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | 180 | mg/kg | Y Mid | 317 |
| Naphthalene | 0.48 | mg/kg | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | 0.17 | mg/kg | N Mid | 307 |
| Fluorene | 0.13 | mg/kg | N Mid | 307 |
| Phenanthrene | 1.7 | mg/kg | N Mid | 307 |
| Anthracene | 0.27 | mg/kg | N Mid | 307 |
| Fluoranthene | 1.1 | mg/kg | N Mid | 307 |
| Pyrene | 1.2 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | 0.62 | mg/kg | N Mid | 307 |
| Chrysene | 0.62 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | 0.52 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | 0.23 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | 0.44 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | 0.43 | mg/kg | N Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | 0.39 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | mg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | 8.3 | mg/kg | N Mid | 307 |
| benzene | <0.10 | mg/kg | Y Mid | 327 |
| toluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Dry Ratio (BSEN 12457) | 99.10 | % | N Mid | Calculated |

Analyst Comments for 10956747:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlends, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





Report Number:

COV/569308/2008

Laboratory Number: 10956748

Issue

Sample 8 of 22

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH14 2.00m-3.00m

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | Method | |
|--------------------------------|--------|---------|---------------|------------|--|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 | |
| Moisture Content Ratio at 105C | 1.67 | % ratio | N Mid | 33 | |
| Moisture at 105c | 1.6 | % | N Mid | 33 | |
| TOC by Ignition in O2 | 3.6 | % | N Mid | 27 | |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 | |
| Mineral Oils, >C10 - C40 | <50 | mg/kg | Y Mid | 317 | |
| Naphthalene | 0.32 | mg/kg | N Mid | 307 | |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 | |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 | |
| Fluorene | <0.10 | mg/kg | N Mid | 307 | |
| Phenanthrene | 0.19 | mg/kg | N Mid | 307 | |
| Anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 | |
| Pyrene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Chrysene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 | |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 | |
| Indeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 | |
| Coronene | <0.10 | mg/kg | N Mid | 307 | |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 | |
| benzene | <0.10 | mg/kg | Y Mid | 327 | |
| toluene | <0.10 | mg/kg | Y Mid | 327 | |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 | |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 | |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 | |
| Dry Ratio (BSEN 12457) | 98.36 | % | N Mid | Calculated | |

Analyst Comments for 10956748:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or NO=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml.

WS=Insufficient sample





COV/569308/2008 Report Number:

Issue

Laboratory Number: 10956749

Sample 9 of 22

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH14 3.00m-4.00m

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | 0.40 | % ratio | N Mid | 33 |
| Moisture at 105c | 0.40 | % | N Mid | 33 |
| TOC by Ignition in O2 | 3.5 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | <50 | mg/kg | Y Mid | 317 |
| Naphthalene | 0.31 | mg/kg | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 |
| Fluorene | <0.10 | mg/kg | N Mid | 307 |
| Phenanthrene | 0.12 | mg/kg | N Mid | 307 |
| Anthracene | <0.10 | mg/kg | N Mid | 307 |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Pyrene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Chrysene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 |
| Indeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | mg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 |
| benzene | <0.10 | mg/kg | Y Mid | 327 |
| toluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| m&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Dry Ratio (BSEN 12457) | 99.60 | % | N Mid | Calculated |

Analyst Comments for 10956749:

No Analyst Comment







Report Number: COV/569308/2008

8/2008 Issue

Laboratory Number: 10956750 Sample 10 of 22

Sample Source: O Callaghan Moran & Assoc.
Sample Point Description: O Callaghan Moran & Assoc.

Sample Description: BH14 8.00m-10.00m

Sample Date: Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | Method | |
|--------------------------------|--------|---------|---------------|------------|--|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 | |
| Moisture Content Ratio at 105C | 0.50 | % ratio | N Mid | 33 | |
| Moisture at 105c | 0.49 | % | N Mid | 33 | |
| TOC by Ignition in O2 | 1.4 | % | N Mid | 27 | |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 | |
| Mineral Oils, >C10 - C40 | <50 | mg/kg | Y Mid | 317 | |
| Naphthalene | 0.28 | mg/kg | N Mid | 307 | |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 | |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 | |
| Fluorene | <0.10 | mg/kg | N Mid | 307 | |
| Phenanthrene | <0.10 | mg/kg | N Mid | 307 | |
| Anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 | |
| Pyrene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Chrysene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 | |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 | |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 | |
| ndeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 | |
| Coronene | <0.10 | mg/kg | N Mid | 307 | |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 | |
| penzene | <0.10 | mg/kg | Y Mid | 327 | |
| pluene | <0.10 | mg/kg | Y Mid | 327 | |
| thylbenzene | <0.10 | mg/kg | Y Mid | 327 | |
| n&p-Xylene | <0.20 | mg/kg | Y Mid | 327 | |
| -xylene | <0.10 | mg/kg | Y Mid | 327 | |
| Dry Ratio (BSEN 12457) | 99.51 | % | N Mid | Calculated | |

Analyst Comments for 10956750:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
For Microblogical determinands 0 or ND=Not Oetected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





Report Number: COV/569308/2008

Issue

Sample 11 of 22

Laboratory Number: 10956751

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

Sample Source:

BH9 4.00m-5.00m

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | Method |
|--------------------------------|--------|---------|---------------|------------|
| EN 12457-3 Leachate | Y | | N Mid | EN12457-3 |
| Moisture Content Ratio at 105C | <0.10 | % ratio | N Mid | 33 |
| Moisture at 105c | <0.10 | % | N Mid | 33 |
| TOC by Ignition in O2 | 2.8 | % | N Mid | 27 |
| PCB, Total of 7 Congeners | <0.010 | mg/kg | N Mid | 312 |
| Mineral Oils, >C10 - C40 | <50 | mg/kg | Y Mid | 317 |
| Naphthalene | 0.12 | mg/kg | N Mid | 307 |
| Acenaphthylene | <0.10 | mg/kg | N Mid | 307 |
| Acenaphthene | <0.10 | mg/kg | N Mid | 307 |
| Fluorene | <0.10 | mg/kg | N Mid | 307 |
| Phenanthrene | <0.10 | mg/kg | N Mid | 307 |
| Anthracene | <0.10 | mg/kg | N Mid | 307 |
| Fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Pyrene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Chrysene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(b)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(k)fluoranthene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(a)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Dibenz(a,h)anthracene | <0.10 | mg/kg | N Mid | 307 |
| Benzo(g,h,i)perylene | <0.10 | mg/kg | N Mid | 307 |
| ndeno(1,2,3-c,d)pyrene | <0.10 | mg/kg | N Mid | 307 |
| Coronene | <0.10 | mg/kg | N Mid | 307 |
| PAH, Total of 17 WAC | <1.0 | mg/kg | N Mid | 307 |
| benzene | <0.10 | mg/kg | Y Mid | 327 |
| oluene | <0.10 | mg/kg | Y Mid | 327 |
| ethylbenzene | <0.10 | mg/kg | Y Mid | 327 |
| n&p-Xylene | <0.20 | mg/kg | Y Mid | 327 |
| o-xylene | <0.10 | mg/kg | Y Mid | 327 |
| Dry Ratio (BSEN 12457) | 99.90 | % | N Mid | Calculated |

Analyst Comments for 10956751:

No Analyst Comment

Accreditation Codes; Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlends, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionetta ND=Not Detected in volume of sample filtered. Relating to Legionetta volume analysed 1g is approximately equivalent to 1ml.

I/S=Insufficient sample







Report Number:

COV/569308/2008

Issue

Laboratory Number: 10956752

Sample 12 of 22

Sample Source:

O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH7 4.00m-5.00m 10:1

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | | Method |
|----------------------------|---------|-------|---------------|-----|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.0084 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y | Mid | 56 |
| Calcium, Soluble | 9.7 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y | Mid | 53F |
| Copper, Soluble | <10 | ug/l | Y | Mid | 53F |
| Lead, Soluble | <10 | ug/l | Y | Mid | 53F |
| Mercury, Soluble | 1.2 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | <0.0030 | mg/l | N | Mid | 68 |
| Nickel, Soluble | <10 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Mid | 25C |
| Zinc, Soluble | <10 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | <11 | mg/l | Y | Mid | 60 |
| Chloride as Cl | <2.5 | mg/l | Y | Mid | 60 |
| Dissolved Solids | <200 | mg/i | N | Mid | 18 |
| Fluoride as F- | 0.30 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 1.3 | mg/l | Y | Mid | 41 |

Analyst Comments for 10956752:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Retailing to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





COV/569308/2008 Report Number:

Laboratory Number: 10956753

Issue

Sample 13 of 22

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc. BH12 0.50m-1.00m 10:1 Sample Description:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008 Sample Date:

| Test Description | Result | Units | Accreditation | Method |
|----------------------------|--------|-------|---------------|----------------|
| Leachate BSEN 10:1 extract | Y | | N Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N Mid | 25C |
| Barîum, Soluble | 0.019 | mg/l | Y Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y Mid | 56 |
| Calcium, Soluble | 68 | mg/l | Y Mid | 53F |
| Chromium, Soluble | 33 | ug/l | Y Mid | 53F |
| Copper, Soluble | <10 | ug/l | Y Mid | 53F |
| Lead, Soluble | <10 | ug/l | Y Mid | 53F |
| Mercury, Soluble | 1.6 | ug/l | Y Mid | 56 |
| Molybdenum, Soluble | 0.0084 | mg/l | N Mid | 68 |
| Nickel, Soluble | <10 | ug/l | Y Mid | 53F |
| Selenium, Soluble | <6.0 | ug/i | N Mid | 25C |
| Zinc, Soluble | <10 | ug/l | Y Mid | 53F |
| Phenol Index | <0.050 | mg/l | N Mid | 32A |
| Sulphate as SO4 | 91 | mg/i | Y Mid | 60 |
| Chloride as CI | <2.5 | mg/l | Y Mid | 60 |
| Dissolved Solids | 320 | mg/l | N Mid | 18 |
| Fluoride as F- | 0.30 | mg/i | Y Mid | 20 |
| TOC (Filtered) | 2.6 | mg/l | Y Mid | 41 |

Analyst Comments for 10956753:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Covenity, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample







Report Number:

COV/569308/2008

Laboratory Number: 10956754

Issue

Sample 14 of 22

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc. Sample Description:

BH12 3.00m-4.00m 10:1

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accre | ditation | Method EN12457-3 10:1 |
|----------------------------|--------|-------|-------|----------|--------------------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | |
| Antimony, Soluble | <0.030 | mg/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.0033 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y | Mid | 56 |
| Calcium, Soluble | 18 | mg/i | Y | Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y | Mid | 53F |
| Copper, Soluble | <10 | ug/l | Y | Mid | 53F |
| Lead, Soluble | <10 | ug/I | Y | Mid | 53F |
| Mercury, Soluble | <0.30 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.031 | mg/l | N | Mid | 68 |
| Nickel, Soluble | <10 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/i | N | Mid | 25C |
| Zinc, Soluble | <10 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | 30 | mg/l | Y | Mid | 60 |
| Chloride as Cl | <2.5 | mg/l | Y | Mid | 60 |
| Dissolved Solids | <200 | mg/l | N | Mid | 18 |
| Fluoride as F- | 0.23 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 2.2 | mg/l | Y | Mid | 41 |

Analyst Comments for 10956754:

No Analyst Comment





Report Number:

COV/569308/2008

Laboratory Number: 10956755

Issue

Sample 15 of 22

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH12 4.00m-5.00m 10:1

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description Leachate BSEN 10:1 extract | Result | Units | Accreditation | on Method |
|--|--------|-------|---------------|----------------|
| | Y | | N Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N Mid | 25C |
| Barium, Soluble | 0.0068 | mg/l | Y Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y Mid | 56 |
| Calcium, Soluble | 12 | mg/l | Y Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y Mid | 53F |
| Copper, Soluble | <10 | ug/l | Y Mid | 53F |
| Lead, Soluble | <10 | ug/l | Y Mid | 53F |
| Mercury, Soluble | <0.30 | ug/l | Y Mid | 56 |
| Molybdenum, Soluble | 0.020 | mg/l | N Mid | 68 |
| Nickel, Soluble | <10 | ug/l | Y Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N Mid | 25C |
| Zinc, Soluble | <10 | ug/t | Y Mid | 53F |
| Phenol Index | <0.050 | mg/l | N Mid | 32A |
| Sulphate as SO4 | <11 | mg/l | Y Mid | 60 |
| Chloride as Ct | <2.5 | mg/l | Y Mid | 60 |
| Dissolved Solids | <200 | mg/l | N Mid | 18 |
| Fluoride as F- | 0.29 | mg/l | Y Mid | 20 |
| TOC (Filtered) | 1.9 | mg/i | Y Mid | 41 |

Analyst Comments for 10956755:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





Report Number: COV/569308/2008 Issue

Laboratory Number: 10956756 Sample 16 of 22

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc. BH12 8.00m-10.00m 10:1 Sample Description:

Sample Date: Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description Leachate BSEN 10:1 extract | Result | Units | Accreditation | | Method |
|---|--------|-------|---------------|-----|----------------|
| | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.017 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/t | Y | Míd | 56 |
| Calcium, Soluble | 17 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y | Mid | 53F |
| Copper, Soluble | <10 | ug/l | Y | Mid | 53F |
| Lead, Soluble | <10 | ug/t | Y | Mîd | 53F |
| Mercury, Soluble | 0.47 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.010 | mg/l | N | Mid | 68 |
| Nickel, Soluble | <10 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | 7.9 | ug/l | N N | Mid | 25C |
| Zinc, Soluble | 19 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | 25 | mg/l | Y | Mid | 60 |
| Chloride as CI | 4.1 | mg/i | Y | Mid | 60 |
| Dissolved Solids | <200 | mg/l | N | Mid | 18 |
| Fluoride as F- | 0.27 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 1.9 | mg/l | Y | Mid | 41 |

Analyst Comments for 10956756: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Rencorn.

For Microbiological determinends 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume enalysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





Report Number: COV/569308/2008

Laboratory Number: 10956757

Issue 1

Sample 17 of 22

Sample Source: O Callaghan Moran & Assoc.
Sample Point Description: O Callaghan Moran & Assoc.
Sample Description: BH14 0.50m-1.00m 10:1

Sample Date: Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditation | Method |
|----------------------------|--------|-------|---------------|----------------|
| Leachate BSEN 10:1 extract | Y | | N Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/i | N Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N Mid | 25C |
| Barium, Soluble | 0.012 | mg/i | Y Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y Mid | 56 |
| Calcium, Soluble | 89 | mg/l | Y Mid | 53F |
| Chromium, Soluble | 53 | ug/l | Y Mid | 53F |
| Copper, Soluble | 24 | ug/l | Y Mid | 53F |
| Lead, Soluble | <10 | ug/l | Y Mid | 53F |
| Mercury, Soluble | 0.51 | ug/l | Y Mid | 56 |
| Molybdenum, Soluble | 0.027 | mg/l | N Mid | 68 |
| Nickel, Soluble | <10 | ug/l | Y Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N Mid | 25C |
| Zinc, Soluble | <10 | ug/l | Y Mid | 53F |
| Phenol Index | <0.050 | mg/l | N Mid | 32A |
| Sulphate as SO4 | 19 | mg/l | Y Mid | 60 |
| Chloride as CI | <2.5 | mg/l | Y Mid | 60 |
| Dissolved Solids | 290 | mg/l | N Mid | 18 |
| Fluoride as F- | <0.20 | mg/l | Y Mid | 20 |
| TOC (Filtered) | 5.8 | mg/l | Y Mid | 41 |

Analyst Comments for 10956757:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri * STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionetia ND=Not Detected in volume of sample filtered. Relating to Legionetia volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





Report Number: COV/569308/2008

Issue 1

Laboratory Number: 10956758

Sample 18 of 22

Sample Source: O Callaghan Moran & Assoc.
Sample Point Description: O Callaghan Moran & Assoc.
Sample Description: BH14 1.00m-2.00m 10:1

Sample Date: Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Test Description Result Units | | Accred | ditation | Method |
|----------------------------|-------------------------------|------|--------|----------|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/i | N | Mid | 25C |
| Barium, Soluble | 0.0097 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y | Mid | 56 |
| Calcium, Soluble | 69 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | 48 | ug/i | Y | Mid | 53F |
| Copper, Soluble | 44 | ug/l | Y | Mid | 53F |
| Lead, Soluble | <10 | ug/l | Y | Mid | 53F |
| Mercury, Soluble | 0.68 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.043 | mg/l | N | Mid | 68 |
| Nickel, Soluble | <10 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Miđ | 25C |
| Zinc, Soluble | <10 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | 82 | mg/l | Y | Mid | 60 |
| Chloride as Cl | 2.9 | mg/l | Y | Mid | 60 |
| Dissolved Solids | <200 | mg/l | N | Mid | 18 |
| Fluoride as F- | 0.20 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 6.9 | mg/l | Y | Mid | 41 |

Analyst Comments for 10956758: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bril = STL Bridgend, Cov' = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionalia ND=Not Detected in volume of sample filtered. Relating to Legionalia volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





Report Number:

COV/569308/2008

Issue

Laboratory Number: 10956759

Sample 19 of 22

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc. Sample Description:

BH14 2.00m-3.00m 10:1

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accred | litation | Method |
|----------------------------|--------|-------|--------|----------|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.013 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/i | Y | Mid | 56 |
| Calcium, Soluble | 130 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | 17 | ug/l | Y | Mid | 53 F |
| Copper, Soluble | 47 | ug/l | Y | Mid | 53F |
| Lead, Soluble | <10 | ug/l | Y | Mid | 53F |
| Mercury, Soluble | 1.2 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.034 | mg/l | N | Mid | 68 |
| Nickel, Soluble | 12 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Mid | 25C |
| Zinc, Soluble | <10 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | 14 | mg/l | Y | Mid | 60 |
| Chloride as Cl | 5.4 | mg/l | Y | Mid | 60 |
| Dissolved Solids | <200 | mg/l | N | Mid | 18 |
| Fluoride as F- | <0.20 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 8.2 | mg/l | Y | Mid | 41 |

Analyst Comments for 10956759:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionalia volume analysed 1g is approximately equivalent to 1ml.

I/S*Insufficient sample







COV/569308/2008 Report Number: Issue

Laboratory Number: 10956760 Sample 20 of 22

Sample Source: O Callaghan Moran & Assoc. Sample Point Description: O Callaghan Moran & Assoc. Sample Description: BH14 3.00m-4.00m 10:1

Sample Date: Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditati | on Method |
|----------------------------|--------|-------|-------------|----------------|
| Leachate BSEN 10:1 extract | Y | | N Mic | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N Mid | 1 25C |
| Arsenic, Soluble | <50 | ug/t | N Mic | 1 25C |
| Barium, Soluble | 0.0046 | mg/l | Y Mic | 1 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y Mic | ı 56 |
| Calcium, Soluble | 18 | mg/l | Y Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y Mic | 53F |
| Copper, Soluble | <10 | ug/l | Y Mic | 53F |
| Lead, Soluble | <10 | ug/l | Y Mic | 53F |
| Mercury, Soluble | 0.39 | ug/I | Y Mic | 56 |
| Molybdenum, Soluble | 0.018 | mg/l | N Mid | i 68 |
| Nickel, Soluble | <10 | ug/i | Y Mic | 1 53F |
| Selenium, Soluble | <6.0 | ug/I | N Mic | 1 25C |
| Zinc, Soluble | <10 | ug/I | Y Mic | 1 53F |
| Phenoi Index | <0.050 | mg/l | N Mic | 1 32A |
| Sulphate as SO4 | <11 | mg/l | Y Mic | I 60 |
| Chloride as Cl | <2.5 | mg/l | Y Mic | 60 |
| Dissolved Solids | <200 | mg/l | N Mic | 18 |
| Fluoride as F- | 0.23 | mg/l | Y Mic | 20 |
| TOC (Filtered) | 2.7 | mg/l | Y Mic | ł 41 |

Analyst Comments for 10956760: No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcom.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml.
I/S=Insufficient sample





Report Number:

COV/569308/2008

Laboratory Number: 10956761

Issue

Sample 21 of 22

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH14 8.00m-10.00m 10:1

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accreditatio | n Method |
|----------------------------|--------|-------|--------------|----------------|
| Leachate BSEN 10:1 extract | Y | | N Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N Mid | 25C |
| Barium, Soluble | 0.027 | mg/i | Y Mid | 54F |
| Cadmium, Soluble | <0.10 | ug/l | Y Mid | 56 |
| Calcium, Soluble | 24 | mg/l | Y Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y Mid | 53F |
| Copper, Soluble | <10 | ug/l | Y Mid | 53F |
| Lead, Soluble | <10 | ug/l | Y Mid | 53F |
| Mercury, Soluble | 0.36 | ug/l | Y Mid | 56 |
| Molybdenum, Soluble | 0.015 | mg/l | N Mid | 68 |
| Nickeł, Soluble | <10 | ug/l | Y Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N Mid | 25C |
| Zinc, Soluble | <10 | ug/l | Y Mid | 53F |
| Phenol Index | <0.050 | mg/l | N Mid | 32A |
| Sulphate as SO4 | 42 | mg/l | Y Mid | 60 |
| Chloride as Ci | 3.5 | mg/l | Y Mid | 60 |
| Dissolved Solids | <200 | mg/l | N Mid | 18 |
| Fluoride as F- | 0.24 | mg/l | Y Mid | 20 |
| TOC (Filtered) | 2.3 | mg/l | Y Mid | 41 |

Analyst Comments for 10956761:

No Analyst Comment





Report Number: COV/569308/2008 Issue

Laboratory Number: 10956762

Sample 22 of 22

Sample Source:

O Callaghan Moran & Assoc.

Sample Point Description: O Callaghan Moran & Assoc.

Sample Description:

BH9 4.00m-5.00m 10:1

Sample Date:

Sample Received 12 December 2008 Analysis Complete: 24 December 2008

| Test Description | Result | Units | Accred | litation | Method |
|----------------------------|--------|-------|--------|----------|----------------|
| Leachate BSEN 10:1 extract | Y | | N | Mid | EN12457-3 10:1 |
| Antimony, Soluble | <0.030 | mg/l | N | Mid | 25C |
| Arsenic, Soluble | <50 | ug/l | N | Mid | 25C |
| Barium, Soluble | 0.0076 | mg/l | Y | Mid | 54F |
| Cadmium, Soluble | <0.10 | tig/l | Y | Mid | 56 |
| Calcium, Soluble | 10 | mg/l | Y | Mid | 53F |
| Chromium, Soluble | <10 | ug/l | Y | Mid | 53F |
| Copper, Soluble | <10 | ug/i | Y | Mid | 53F |
| Lead, Soluble | <10 | ug/l | Y | Mid | 53F |
| Mercury, Soluble | 0.78 | ug/l | Y | Mid | 56 |
| Molybdenum, Soluble | 0.0056 | mg/l | N | Mid | 68 |
| Nickel, Soluble | <10 | ug/l | Y | Mid | 53F |
| Selenium, Soluble | <6.0 | ug/l | N | Mid | 25C |
| Zinc, Soluble | <10 | ug/l | Y | Mid | 53F |
| Phenol Index | <0.050 | mg/l | N | Mid | 32A |
| Sulphate as SO4 | <11 | mg/l | Y | Mid | 60 |
| Chloride as Cl | <2.5 | mg/l | Y | Mid | 60 |
| Dissolved Solids | <200 | mg/l | N | Mid | 18 |
| Fluoride as F- | 0.27 | mg/l | Y | Mid | 20 |
| TOC (Filtered) | 1.4 | mg/l | Y | Mid | 41 |

Analyst Comments for 10956762:

No Analyst Comment

Accorditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: 8ri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Ree = STL Reading, Run = STL Runcovn.

For Microbiogical determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1mt. I/S=Insufficient sample

Name: G. Smith

Date: 24 December 2008

Signed:

Title:

Inorg and License Chem Manager



Mr Crean
O Callaghan Moran & Associates
Granary House
Rutland Street
Cork Cork

19 December 2008

Test Report: COV/566856/2008

Dear Mr Crean

Analysis of your sample(s) submitted on 03 December 2008 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using STL and we look forward to receiving your next samples.

Yours Sincerely,

Signed: Ausa Clay

Name: S. Clancy

Title: Organic Chemistry Manager

STL Coventry

Tel: +44 (0)24 7642 1213

STL Business Centre, Torrington Avenue, Coventry, CV4 9GU

Fax: +44 (0)24 7685 6575

www.stl-ltd.com

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Report Summary





Mr Donal Crean O Callaghan Moran & Associates **Granary House** Rutland Street Cork Cork

Date of Issue:

19 December 2008

Report Number: COV/566856/2008

Issue 1

Analysis Commenced: 03 December 2008

Job Description:

Chemical Analysis

Job Location:

08-014-05

Number of Samples

Signed: Ausa Clay

included in this report

Job Received:

03 December 2008

Number of Test Results

included in this report 188

Name: S. Clancy

Date: 19 December 2008

Title:

Organic Chemistry Manager

STL was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

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Report Number:

COV/566856/2008

Issue

Laboratory Number: 10940877

Sample 1

Sample Source: O Callaghan Moran & Associates Sample Point Description: O Callaghan Moran & Associates

Sample Description: **RC-16S**

Sample Date: 01 December 2008 Sample Received 03 December 2008 Analysis Complete: 18 December 2008

| Test Description | Result | Units | Accreditation | Method |
|----------------------------|----------|-------|---------------|--------|
| Antimony, Soluble | 0.00048 | mg/l | Y MID | 56 |
| Arsenic, Soluble | 0.0069 | mg/l | Y MID | 56 |
| Barium, Soluble | 0.056 | mg/l | Y MID | 54F |
| Cadmium, Soluble | <0.00010 | mg/l | Y MID | 56 |
| Hardness, Calcium as CaCO3 | 100 | mg/l | N MID | 53F |
| Chromium, Soluble | <0.030 | mg/l | Y MID | 56 |
| Copper, Soluble | 0.025 | mg/l | Y MID | 56 |
| Iron, Soluble | 0.41 | mg/l | Y MID | 56 |
| Lead, Soluble | 0.0033 | mg/l | Y MID | 56 |
| Magnesium, Soluble | 6.6 | mg/l | Y MID | 53F |
| Manganese, Soluble | 0.17 | mg/l | Y MID | 53F |
| Mercury, Soluble | <0.00030 | mg/l | Y MID | 56 |
| Nickel, Soluble | 0.0060 | mg/l | Y MID | 56 |
| Potassium, Soluble | 60 | mg/I | Y MID | 53F |
| Sodium, Soluble | 100 | mg/l | Y MID | 53F |
| Tin, Soluble | <0.010 | mg/l | N MID | 68 |
| Zinc, Soluble | 0.053 | mg/i | Y MID | 56 |
| Sulphate as SO4 | <0.011 | g/l | Y MID | 60 |
| Bicarbonate as CaCO3 | 710 | mg/l | OIM N | 2 |
| Chloride as Cl | 150 | mg/l | Y MID | 60 |
| Sulphide as S | 0.14 | mg/l | Y MID | 38A |
| TPH >C6 - C10 | <100 | ug/l | Y MID | 318 |
| TPH >C10 - C20 | 330 | ug/l | Y MID | 318 |
| TPH >C20 - C40 | 7700 | ug/(| Y MID | 318 |
| TPH >C6 - C40, Total | 8000 | ug/l | Y MID | 318 |
| Naphthalene | 2.2 | ug/l | Y MID | 331 |
| Acenaphthene | 0.68 | ug/l | Y MID | 331 |
| Acenaphthylene | 0.12 | ug/l | Y MID | 331 |
| Fluorene | 0.78 | ug/l | Y MID | 331 |
| Phenanthrene | 7.6 | ug/l | Y MID | 331 |
| Anthracene | 1.1 | ug/l | Y MID | 331 |
| Fluoranthene | 5.6 | ug/I | Y MID | 331 |
| Pyrene | 4.6 | ug/l | Y MID | 331 |
| Benzo(a)anthracene | 3.6 | ug/l | Y MID | 331 |
| Chrysene | 7.3 | ug/l | Y MID | 331 |





Report Number: COV/566856/2008

Issue

Laboratory Number: 10940877

Sample 1 of 4

Sample Source: O Callaghan Moran & Associates Sample Point Description: O Callaghan Moran & Associates

RC-16S Sample Description:

Sample Date: 01 December 2008 Sample Received 03 December 2008 Analysis Complete: 18 December 2008

| Test Description | Result | Units | Accreditation | Method |
|-------------------------|--------|-------|---------------|--------|
| Benzo(b)fluoranthene | 0.51 | ug/l | Y MID | 331 |
| Benzo(k)fluoranthene | 0.36 | ug/I | Y MID | 331 |
| Benzo(a)pyrene | 0.91 | ug/l | Y MID | 331 |
| Dibenz(a,h)anthracene | 0.11 | ug/l | Y MID | 331 |
| Benzo(g,h,i)perylene | 0.65 | ug/l | Y MID | 331 |
| Indeno(1,2,3-c,d)pyrene | 0.70 | ug/l | Y MID | 331 |
| PAH, Total | 16 | ug/l | Y MID | 331 |
| 3enzene | <10 | ug/l | N MID | 329 |
| Toluene | <10 | ug/l | N MID | 329 |
| Ethylbenzene | <10 | ug/l | N MID | 329 |
| m&p-Xylene | <20 | ug/l | N MID | 329 |
| o-Xylene | <10 | ug/l | N MID | 329 |

Analyst Comments for 10940877:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Middends, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionells ND=Not Detected in volume of sample (Ntered, Relating to Legionells volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





Report Number:

COV/566856/2008

Laboratory Number: 10940878

issue

Sample 2

Sample Source:

O Callaghan Moran & Associates

Sample Point Description: O Callaghan Moran & Associates

Sample Description:

RC-16B

Sample Date: 01 December 2008 Sample Received 03 December 2008 Analysis Complete: 18 December 2008

| Test Description | Result | Units | Accreditation | Method |
|----------------------------|---------|-------|---------------|--------|
| Antimony, Soluble | 0.0023 | mg/l | Y MID | 56 |
| Arsenic, Soluble | 0.0059 | mg/l | Y MID | 56 |
| Barîum, Soluble | 0.12 | mg/l | Y MID | 54F |
| Cadmium, Soluble | 0.00024 | mg/l | Y MID | 56 |
| Hardness, Calcium as CaCO3 | 210 | mg/l | N MID | 53F |
| Chromium, Soluble | <0.030 | mg/l | Y MID | 56 |
| Copper, Soluble | 0.0096 | mg/l | Y MID | 56 |
| Iron, Soluble | 0.55 | mg/l | Y MID | 56 |
| Lead, Soluble | 0.00081 | mg/l | Y MID | 56 |
| Magnesium, Soluble | 28 | mg/l | Y MID | 53F |
| Manganese, Soluble | 0.070 | mg/l | Y MID | 53F |
| Mercury, Soluble | 0.00074 | mg/l | Y MID | 56 |
| Nickel, Soluble | 0.0039 | mg/l | Y MID | 56 |
| Potassium, Soluble | 7.6 | mg/l | Y MID | 53F |
| Sodium, Soluble | 680 | mg/l | Y MID | 53F |
| Tin, Soluble | <0.010 | mg/i | N MID | 68 |
| Zinc, Soluble | 0.016 | mg/i | Y MID | 56 |
| Sulphate as SO4 | 0.23 | g/l | Y MID | 60 |
| Bicarbonate as CaCO3 | 350 | mg/l | N MID | 2 |
| Chloride as CI | 860 | mg/l | Y MID | 60 |
| Sulphide as S | 0.011 | mg/i | Y MID | 38A |
| TPH >C6 - C10 | <100 | ug/l | Y MID | 318 |
| TPH >C10 - C20 | <100 | ug/l | Y MID | 318 |
| TPH >C20 - C40 | <100 | ug/l | Y MID | 318 |
| TPH >C6 - C40, Total | <100 | ug/l | Y MID | 318 |
| Naphthalene | 0.11 | ug/l | Y MID | 331 |
| Acenaphthene | <0.010 | ug/l | Y MID | 331 |
| Acenaphthylene | 0.016 | ug/l | Y MID | 331 |
| Fluorene | 0.021 | ug/i | Y MID | 331 |
| Phenanthrene | 0.046 | ug/l | Y MID | 331 |
| Anthracene | <0.010 | ug/l | Y MID | 331 |
| Fluoranthene | <0.010 | ug/l | Y MID | 331 |
| Pyrene | 0.016 | ug/l | Y MID | 331 |
| Benzo(a)anthracene | 0.011 | ug/I | Y MID | 331 |
| Chrysene | <0.010 | ug/l | Y MID | 331 |





Report Number:

COV/566856/2008

Issue

Laboratory Number: 10940878

Sample 2

Sample Source:

O Callaghan Moran & Associates

Sample Point Description: O Callaghan Moran & Associates

Sample Description:

RC-16B

Sample Date: 01 December 2008 Sample Received 03 December 2008 Analysis Complete: 18 December 2008

| Test Description | Result | Units | Accreditation | Method |
|------------------------|--------|-------|---------------|--------|
| Benzo(b)fluoranthene | <0.010 | ug/l | Y MID | 331 |
| Benzo(k)fluoranthene | <0.010 | ug/l | Y MID | 331 |
| Benzo(a)pyrene | <0.010 | ug/i | Y MID | 331 |
| Dibenz(a,h)anthracene | <0.010 | ug/l | Y MID | 331 |
| Benzo(g,h,i)perylene | <0.010 | ug/l | Y MID | 331 |
| ndeno(1,2,3-c,d)pyrene | <0.010 | ug/l | Y MID | 331 |
| PAH, Total | 0.25 | ug/l | Y MID | 331 |
| Benzene | <10 | ug/l | N MID | 329 |
| Toluene | <10 | ug/l | N MID | 329 |
| Ethylbenzene | <10 | ug/l | N MID | 329 |
| m&p-Xylene | <20 | ug/l | N MID | 329 |
| o-Xylene | <10 | ug/l | N MID | 329 |

Analyst Comments for 10940878:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted,
Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1ml. I/S=Insufficient sample





Report Number:

COV/566856/2008

Laboratory Number: 10940879

Issue

Sample 3

Sample Source:

O Callaghan Moran & Associates

Sample Point Description: O Callaghan Moran & Associates

Sample Description:

Sample Date: 01 December 2008 Sample Received 03 December 2008 Analysis Complete: 18 December 2008

| Test Description | Result | Units | Accreditation | Method |
|----------------------------|----------|-------|---------------|--------|
| Antimony, Soluble | 0.00017 | mg/t | Y MID | 56 |
| Arsenic, Soluble | <0.0010 | mg/l | Y MID | 56 |
| Barium, Soluble | 0.015 | mg/l | Y MID | 54F |
| Cadmium, Soluble | 0.00014 | mg/l | Y MID | 56 |
| Hardness, Calcium as CaCO3 | 360 | mg/t | N MID | 53F |
| Chromium, Soluble | <0.030 | mg/l | Y MID | 56 |
| Copper, Soluble | <0.0070 | mg/l | Y MID | 56 |
| Iron, Soluble | 0.045 | mg/I | Y MID | 56 |
| Lead, Soluble | <0.00050 | mg/l | Y MID | 56 |
| Magnesium, Soluble | 8.8 | mg/l | Y MID | 53F |
| Manganese, Soluble | 0.022 | mg/l | Y MID | 53F |
| Mercury, Soluble | <0.00030 | mg/l | Y MID | 56 |
| Nickel, Soluble | <0.00050 | mg/i | Y MID | 56 |
| Potassium, Soluble | 11 | mg/i | Y MID | 53F |
| Sodium, Soluble | 35 | mg/l | Y MID | 53F |
| Tin, Soluble | <0.010 | mg/l | N MID | 68 |
| Zinc, Soluble | <0.0050 | mg/l | Y MID | 56 |
| Sulphate as SO4 | 0.15 | g/l | Y MID | 60 |
| Bicarbonate as CaCO3 | 200 | mg/l | N MID | 2 |
| Chloride as Cl | 39 | mg/l | Y MID | 60 |
| Sulphide as S | <0.010 | mg/l | Y MID | 38A |
| TPH >C6 - C10 | <100 | ug/i | Y MID | 318 |
| TPH >C10 - C20 | <100 | ug/l | Y MID | 318 |
| TPH >C20 - C40 | <100 | ug/l | DIM Y | 318 |
| TPH >C6 - C40, Total | <100 | ug/l | Y MID | 318 |
| Naphthalene | 0.054 | ug/l | Y MID | 331 |
| Acenaphthene | <0.010 | ug/l | Y MID | 331 |
| Acenaphthylene | <0.010 | ug/l | Y MID | 331 |
| Fluorene | <0.010 | ug/l | Y MID | 331 |
| Phenanthrene | 0.017 | ug/l | Y MID | 331 |
| Anthracene | <0.010 | ug/l | Y MID | 331 |
| Fluoranthene | <0.010 | ug/l | Y MID | 331 |
| Pyrene | <0.010 | ug/l | Y MID | 331 |
| Benzo(a)anthracene | <0.010 | ug/l | Y MID | 331 |
| Chrysene | <0.010 | ug/i | Y MID | 331 |





Report Number:

COV/566856/2008

Issue

Laboratory Number: 10940879

of 4 Sample 3

Sample Source:

O Callaghan Moran & Associates

Sample Point Description: O Callaghan Moran & Associates

Sample Description:

Sample Date: 01 December 2008 Sample Received 03 December 2008 Analysis Complete: 18 December 2008

| Test Description | Result | Units | Accreditation | Method |
|-------------------------|--------|-------|---------------|--------|
| Benzo(b)fluoranthene | <0.010 | ug/l | Y MID | 331 |
| Benzo(k)fluoranthene | <0.010 | ug/l | Y MID | 331 |
| Benzo(a)pyrene | <0.010 | ug/l | Y MID | 331 |
| Dibenz(a,h)anthracene | <0.010 | ug/l | Y MID | 331 |
| Benzo(g,h,i)perylene | <0.010 | ug/l | Y MID | 331 |
| Indeno(1,2,3-c,d)pyrene | <0.010 | ug/l | Y MID | 331 |
| PAH, Total | <0.10 | ug/l | Y MID | 331 |
| Benzene | <10 | ug/l | N MID | 329 |
| Toluene | <10 | ug/l | N MID | 329 |
| Ethylbenzene | <10 | ug/l | N MID | 329 |
| m&p-Xylene | <20 | ug/l | N MID | 329 |
| o-Xylene | <10 | ug/l | N MID | 329 |

Analyst Comments for 10940879:

No Analyst Comment

Accreditation Codes: Y = UKAS Accredited, N = Not UKAS Accredited, M = MCERTS, S = Sub-contracted.

Analysed at: Bri = STL Bridgend, Cov = STL Coventry, Mid = STL Midlands, Rea = STL Reading, Run = STL Runcorn.

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. Relating to Legionella volume analysed 1g is approximately equivalent to 1mi. US=Insufficient sample





Report Number:

COV/566856/2008

Laboratory Number: 10940880

Issue

Sample 4

Sample Source:

O Callaghan Moran & Associates

Sample Point Description: O Callaghan Moran & Associates

Sample Description:

Sample Date: 01 December 2008 Sample Received 03 December 2008 Analysis Complete: 18 December 2008

| Test Description | Result | Units | Accreditation | Method |
|----------------------------|----------|-------|---------------|-------------|
| Antimony, Soluble | 0.00015 | mg/l | Y MID | 56 |
| Arsenic, Soluble | <0.0010 | mg/l | Y MID | 56 |
| Barium, Soluble | 0.018 | mg/l | Y MID | 54F |
| Cadmium, Soluble | <0.00010 | mg/l | Y MID | 56 |
| Hardness, Calcium as CaCO3 | 360 | mg/l | N MID | 53F |
| Chromium, Soluble | <0.030 | mg/l | Y MID | 56 |
| Copper, Soluble | <0.0070 | mg/l | Y MID | 56 |
| iron, Soluble | 0.041 | mg/l | Y MID | 56 |
| Lead, Soluble | <0.00050 | mg/l | Y MID | 56 |
| Magnesium, Soluble | 8.4 | mg/l | Y MID | 53F |
| Manganese, Soluble | <0.010 | mg/l | Y MID | 53F |
| Mercury, Soluble | <0.00030 | mg/l | Y MID | 56 |
| Nickel, Soluble | <0.00050 | mg/l | Y MID | 56 |
| Potassium, Soluble | 10 | mg/l | Y MID | 53F |
| Sodium, Soluble | 35 | mg/l | Y MID | 53F |
| Tin, Soluble | <0.010 | mg/l | N MID | 68 |
| Zinc, Soluble | <0.0050 | mg/l | Y MID | 56 |
| Sulphate as SO4 | 0.16 | g/l | Y MID | 60 |
| Bicarbonate as CaCO3 | 200 | mg/l | N MID | 2 |
| Chloride as CI | 41 | mg/l | Y MID | 60 |
| Sulphide as S | <0.010 | mg/l | Y MID | 38A |
| TPH >C6 - C10 | <100 | ug/l | Y MID | 318 |
| TPH >C10 - C20 | <100 | ug/l | Y MID | 318 |
| TPH >C20 - C40 | <100 | ug/l | Y MID | 318 |
| TPH >C6 - C40, Total | <100 | ug/l | Y MID | 318 |
| Naphthalene | 0.081 | ug/l | Y MID | 331 |
| Acenaphthene | 0.054 | ug/l | Y MID | 3 31 |
| Acenaphthylene | <0.010 | ug/(| Y MID | 331 |
| Fluorene | 0.051 | ug/l | Y MID | 331 |
| Phenanthrene | 0.26 | ug/l | Y MID | 331 |
| Anthracene | 0.034 | ug/i | Y MID | 331 |
| Fluoranthene | 0.16 | ug/l | Y MID | 331 |
| Pyrene | 0.27 | ug/l | Y MID | 331 |
| Benzo(a)anthracene | 0.15 | ug/l | Y MID | 331 |
| Chrysene | 0.12 | ug/l | Y MID | 331 |





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Issue

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Sample 4

Sample Source:

O Callaghan Moran & Associates

Sample Point Description: O Callaghan Moran & Associates

Sample Description:

W1-B

Sample Date: 01 December 2008 Sample Received 03 December 2008 Analysis Complete: 18 December 2008

| Test Description | Result | Units | Accreditation | Method |
|-------------------------|--------|-------|---------------|--------|
| Benzo(b)fluoranthene | 0.078 | ug/l | Y MID | 331 |
| Benzo(k)fluoranthene | 0.056 | ug/l | Y MID | 331 |
| Benzo(a)pyrene | 0.13 | ug/i | Y MID | 331 |
| Dibenz(a,h)anthracene | 0.023 | ug/l | Y MID | 331 |
| Benzo(g,h,i)perylene | 0.090 | ug/l | Y MID | 331 |
| Indeno(1,2,3-c,d)pyrene | 0.16 | ug/l | Y MID | 331 |
| PAH, Total | 1.7 | ug/l | Y MID | 331 |
| Benzene | <10 | ug/i | N MID | 329 |
| Toluene | <10 | ug/l | N MID | 329 |
| Ethylbenzene | <10 | ug/l | N MID | 329 |
| m&p-Xylene | <20 | ug/l | N MID | 329 |
| o-Xylene | <10 | ug/l | N MID | 329 |

Analyst Comments for 10940880:

No Analyst Comment

Signed: Ausa Clay

Name:

S. Clancy

Date: 19 December 2008

Title:

Organic Chemistry Manager



ANALYST COMMENTS FOR REPORT

COV/566856/2008

1 Issue

Date of Issue: 19 December 2008

Analyst Comments Sample No 10940877 10940878 10940879 10940880

Signed: Jusa Clay

Name: S. Clancy

Date: 19 December 2008

Organic Chemistry Manager



DETERMINAND COMMENTS FOR REPORT COV/566856/2008

ISSUE 1

Date of Issue: 19 December 2008

| ample No | Description | Determinand | Comn | ments | | |
|----------|-------------|--------------|--------|---------------------------|-------|------------------|
| | d | , | Name: | S. Clancy | Date: | 19 December 2008 |
| Signed | : Ausa Ca | J | Title: | Organic Chemistry Manager | | |