

Appendix 13C

ESB Generating Station Tarbert, Environmental Site Assessment, URS 2009

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**Environmental Site  
Assessment**

**ESB Generating Station,  
Tarbert, Co. Kerry**

6 November 2009  
Final

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## EXECUTIVE SUMMARY

URS Ireland Limited (URS) is pleased to present this report to the Electricity Supply Board (ESB), detailing the findings of a Phase 1 and 2 Environmental Site Assessment (ESA) undertaken at the ESB Tarbert Power Generating Station, Tarbert, Co. Kerry.

ESB is in the process of divesting this asset and has engaged URS to undertake the ESA to support the divestment process. The objective of the ESA was to assess the current environmental status of the site, with particular reference to soil, sediment, surface water and groundwater quality.

The Phase 1 assessment comprised a review of information pertaining to environmental soil and groundwater quality on the site, with particular focus on site history, site environmental sensitivity, site operations, and materials storage.

The Phase 2 environmental sampling locations were selected on the basis of the Phase 1 ESA results, observations made during site walkover inspections and information gathered from key site personnel. The sample locations were chosen so as to target the identified environmental 'risk areas' and to gain general coverage across the site.

Environmental soil samples were collected through hand augering, test pitting and bore drilling. Monitoring wells were installed at strategic locations and groundwater samples collected and analysed. Samples of surface waters and sediments were also collected and analysed for key contaminants of concern.

Based on the results and observations of the Phase 1 and 2 ESA, URS has drawn the following conclusions:

- From the perspective of human health and potential risks posed by environmental soil, sediment, groundwater and surface water quality to site users, the site is considered suitable for continued industrial use.
- In general, the analytical results for most soil and sediment analytes were comparable to Dutch screening values. There were exceedances of the Dutch intervention values for hydrocarbons (mineral oil), copper, vanadium, nickel and zinc at four locations across the site.
- A conservative assessment of the soil analytical data (using GACs) collected during the ESA identified potential risks to controlled waters (i.e. groundwater and surface water) from a number of metals across the entire site as well as TPH and PAH compounds on the island portion of the site. Their presence warrants a quantitative risk assessment (QRA) to assess in more detail potential risks to the local ecosystems (estuary). Such an assessment may comprise additional sampling, but would be largely desktop based. It is considered unlikely that these findings represent significant liability issues.
- A localised area of hydrocarbon impact was observed in soil and sediment in the vicinity of the heavy waste storage area on the island portion of the site. Further investigation should be undertaken to assess the extent of the observed hydrocarbon impact and the need for remedial action.
- Elevated hydrocarbon and polychlorinated biphenyl (PCB) concentrations were detected in a groundwater sample collected from monitoring well BH318 located immediately south of the

220kV switching yard. It is understood that PCBs were never detected in the main transformers at Tarbert. In addition, PCBs were not detected in any of the other soil, sediment, groundwater or surface water samples analysed.

- Further groundwater sampling carried out at monitoring well BH318 in December 2008 confirmed the findings of the initial groundwater monitoring event. The installation of additional groundwater monitoring wells in the vicinity of BH318 should be undertaken in order to further assess the extent of PCBs in groundwater at this part of the site. In addition, trial pits should be excavated in the vicinity of monitoring well BH318 to assess the source of the PCB impact.
- TPH concentrations were detected above the IGV in a sample collected from monitoring well BH24 located downgradient of the oil interceptor trench on the mainland. Low-level concentrations of PAHs were also detected. These concentrations may indicate impact from the oil product known to be present in soil on that portion of the site. This well should be included in any future groundwater monitoring strategy for the site.
- The former waste disposal areas (which were capped in 2006) appear to be impacting on groundwater quality beneath the site, with elevated levels of nitrogen compounds observed in monitoring wells installed in and adjacent to these areas. Impact on controlled waters from these areas should be assessed as part of the ongoing groundwater and surface water monitoring programme at the site.
- Elevated concentrations of coliforms were detected in groundwater and surface waters across the site. The occurrence of these coliforms may be associated with sewage effluent from the treatment systems on site or from local agricultural practices. However their presence on a widespread basis across the site suggests a regional influence rather than a point source on the site.
- The presence of asbestos containing materials (ACM) in the subsurface is considered unlikely, except in the capped waste disposal areas, where ACM is known to exist.

In summary, no remedial action is currently considered necessary at the site under a continued industrial land use scenario, from the perspective of environmental soil and groundwater quality; however further assessment of a number of issues is recommended.

## **1. INTRODUCTION & OBJECTIVES**

URS Ireland Limited (URS) is pleased to present this report to the Electricity Supply Board (ESB), detailing the findings of a Phase 1 and 2 environmental site assessment (ESA) undertaken at the ESB Tarbert Power Generating Station, Tarbert, Co. Kerry.

ESB is in the process of divesting this asset and has engaged URS to undertake the ESA to support the divestment process. The station location is presented on Figure 1 and the area to be divested is shown outlined in red in Figure 2 (hereafter referred to as “the site”).

The works were carried out in accordance with URS Proposal No. 3052214 dated 6 June 2008, which was submitted as part of ESB Tender No. PG108T613, and the subsequent scope of work e-mailed to ESB on 24 September 2008.

The site currently operates as a heavy fuel oil (HFO) burning power-generating station and is located approximately 1km north of Tarbert village on the Shannon Estuary.

An Integrated Pollution Prevention Control (IPPC) licence (Reg. No. P0607-02) was issued to the site by the Environmental Protection Agency (EPA) on 27 January 2005.

The objective of the ESA was to assess the current environmental status of the site, with particular reference to soil, sediment, surface water and groundwater quality. The buildings and structures located on site (and the materials contained in them) were not included in this ESA.

## 2. PHASE 1 ASSESSMENT – SCOPE & METHODOLOGY

A Phase 1 Assessment of the site was undertaken by URS in late September 2008.

The Phase 1 (desk study) assessment comprised a review of information pertaining to environmental soil and groundwater quality on the site, with particular focus on the following:

- Site history;
- Site environmental sensitivity;
- Site operations; and
- Materials storage.

Components of the study included:

- A preliminary walkover inspection of the subject areas on 17 September 2008;
- A review of information from the following sources:
  - Geological Survey of Ireland (GSI) for site geology and hydrogeology;
  - Environmental Protection Agency (EPA) both correspondence held on file on site and information pertaining to surrounding waste or IPPC licensed sites;
  - National Parks and Wildlife Service (NPWS) for information pertaining to surrounding Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Natural Heritage Areas (NHAs);
  - Ordnance Survey of Ireland (OSI);
  - IPPC licence application documents and Annual Environmental Reports (AERs); and
  - Environmental Liabilities Risk Assessment (ELRA), TMS Consultancy Ltd, 19 July 2006, Report Ref. 06131.
- A review of previous environmental site investigation reports relating to the site including:
  - An Environmental Impact Assessment of Tarbert Generating Station Upon the Local Soil and Groundwater Quality, ESBI, October 1997, Report Ref. 4D615A;
  - Tarbert Generating Station, Annual Water Quality Monitoring 1998, March 1999, Report Ref. P004E801A-R-01;
  - Investigation of Possible Land Contamination, Phase 1, ESBI, November 2000, Report Ref. P004E001-Final;
  - ESB Tarbert Groundwater and Intrusive Investigation, Minerex Environmental Limited, 21 February 2001, Report Ref. 1289-090;
  - Tarbert Generating Station, Investigation of Possible Land Contamination, Phase 2, ESBI, March 2002; Report Ref. 4E013-R5-Final;

- Environmental Risk Assessment & Remediation Plan, Former Waste Disposal Areas, Tarbert Generating Station, Co. Kerry, URS Ireland Ltd, July 2003, Project Ref. 44871-010-447;
- Supervision of Construction of a Cut-Off Trench, ESB Generating Station, Tarbert, Co. Kerry (Letter Report), URS Ireland Ltd, 17 November 2004, Ref. 44871-032-447; and
- Construction Quality Assurance report, Capping of Former Waste Disposal Areas, Tarbert Power Station, Co. Kerry, URS Ireland Ltd, November 2007, Report Ref. 45078665.

### 3. PHASE 1 FINDINGS

#### 3.1 Site Description

For the purposes of this report, the site has been divided into two main areas comprising the island area and the mainland area. These two areas are connected via a causeway. The site also includes a foreshore lease area that extends into the estuary. All of the plant associated with power generation (including a HFO tank farm) is located on the island. A second HFO tank farm is located on the mainland portion of the site. The site layout is presented in Figure 2 and a description of the site is contained below.

##### 3.1.1 Island Area

The island portion of the site (hereafter referred to as 'the island') extends from the main station entrance (to the east) to beyond the old car park (to the west) and includes the cooling water lagoon. The island is bordered by the estuary to the north, east and southeast.

The main buildings on, and components of the island are as follows:

- 'A' Station (housing Units 1 and 2) and 'B' Station (housing Units 3 and 4) buildings;
- Turbine hall;
- Chimney stacks;
- Control building;
- Administration building;
- Diesel and propane storage area;
- Stores and workshops;
- Boilers sludge storage area;
- Water reservoir;
- Cooling water intake and pumphouse;
- Water treatment plant;
- Effluent neutralisation plant;
- Sewage treatment plant;
- Boiler wash effluent tank;
- Heavy waste storage area;
- Asbestos storage area;
- Drum storage area;
- Lighthouse keepers compound;
- Lube oil storage area;

- Island HFO tank farm;
- 220kV and 110kV switching yards; and
- Old car park area.

The majority of the island is generally flat and lies at an elevation of 3m to 5m above Ordnance Datum (aOD), with the exception of the water reservoir and 110kV switching yard which are elevated above the remainder of the island by approximately 5m.

The surface of the island consists of sealed tarmacadam and concrete (approximately 30%) and unsealed hardcore gravel and grassed areas (approximately 70%). Former waste disposal areas in the old car park and the lighthouse keeper's compound were capped in 2006.

**3.1.2 Mainland Area**

The mainland portion of the site (hereafter referred to as 'the mainland') extends from the western boundary of the old car park area (to the east) to the former station dump area (to the west). It is bordered to the north by the estuary and to the south and west by agricultural land.

Features in this area include the mainland HFO tank farm and pumphouse and the former station dump, which was capped in 2006. The topography is undulating and slopes steeply from south to north towards the estuary. The majority of the surface within this area consists of grass and scrubland.

**3.1.3 Foreshore Lease Area**

The site includes an area of foreshore leased by ESB. This area includes the portion of the estuary occupied by the HFO unloading jetty structure and a lighthouse.

**3.1.4 Surrounding Land Use**

Land-use in the vicinity of the site at the time of the site inspection was predominantly agricultural and can be summarised as follows:

Site Boundary	Land Use
North	Shannon Estuary
South	Agricultural lands
East	Shannon Estuary
West	Agricultural lands

## 3.2 Regional Setting

### 3.2.1 Solid Geology and Hydrogeology

According to the GSI<sup>1</sup>, the geology underlying the site consists of the Shannon Group of undifferentiated mudstones, siltstones and sandstones. Dark grey siltstone bedrock with a weathered horizon was encountered during previous investigations undertaken by ESBI and URS.

The Shannon Group is classified by the GSI as a “Locally Important bedrock aquifer, which is moderately productive only in local zones”. Groundwater on the southwestern shore of the site is described by the GSI as “extremely vulnerable”, due to the presence of rock at/near the ground surface. Groundwater vulnerability is also described as “extreme” in the area immediately to the east of the mainland tank farm. In other areas of the site, only an interim study on groundwater vulnerability has been carried out, indicating “high to low” vulnerability. Groundwater at the site is expected to achieve “good” status in accordance with the Water Framework Directive<sup>2</sup>.

The GSI wells database<sup>1</sup> indicates that there are seven off-site wells within a three kilometre radius of the site.

- Known well depths range from 2.7m bgl (metres below ground level) (dug well) to 90m bgl. Bedrock was met at depths of between 1.5m bgl and 12.2m bgl.
- The closest well to the site is located approximately 1.1km to the southwest of the site. The well is poor-yielding and is used for agricultural and domestic purposes.
- A spring located approximately 2.8km to the southwest of the site is used as Tarbert public water supply. The EPA indicates that faecal coliforms and an average nitrate concentration of 6.5mg/l were present in this drinking water supply between 2004 and 2006<sup>2</sup>.
- The remaining well yields range from poor to excellent and are used for industrial, agricultural, domestic and unknown purposes.

### 3.2.2 Subsoil Geology and Hydrogeology

According to the GSI, subsoil geology at the site consists of made ground and bedrock outcrops on the eastern shore of the site and adjacent to the mainland tank farm. Natural soils to the south of the site consist of tills derived from Namurian shales and sandstone.

Previous investigation reports (see Section 3.4) found the site to consist of made ground underlain by natural gravelly silts and clays and some peat horizons on the western portion of the site. Bedrock was generally found to be present at shallow depths across

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<sup>1</sup> <http://www.gsi.ie/Mapping.htm>

<sup>2</sup> <http://maps.epa.ie/InternetMapView/MapView.aspx>

the site, however up to 6.5m of overburden was encountered in borehole BH9 adjacent to the 220kV switching yard.

The made ground on the site was found during previous investigations to have permeability ranging from  $1.46 \times 10^{-6}$  m/s to  $5.4 \times 10^{-6}$  m/s. Bedrock beneath the mainland tank farm was found to have an average permeability of  $5.5 \times 10^{-7}$  m/s.

Previous investigations found shallow groundwater in the overburden across the site, with groundwater elevations tidally influenced. Groundwater within the overburden material was inferred to flow in a radial pattern towards the estuary and the cooling water lagoon on the island portion of the site. Groundwater on the mainland is thought to flow towards the estuary and a stream located immediately west of the former station dump. Groundwater quality data compiled by ESBI indicates that groundwater at the site is brackish.

### 3.2.3 Surface Water

The following water bodies are located in the vicinity of the site:

- The site is bordered by the River Shannon estuary to the north, west and east. Water quality in the estuary is described by the EPA<sup>2</sup> as unpolluted but at risk of not achieving good status under the Water Framework Directive.
- An unnamed stream flows into the estuary along the southwestern border of the site adjacent to the mainland tank farm.
- An unnamed river flows through Tarbert village into the estuary approximately 1.5km southeast of the site. Water quality in the river is described by the EPA<sup>2</sup> as moderate and at risk of not achieving good status under the Water Framework Directive.
- Three other unnamed streams flow into the estuary in the vicinity of the site, two at a distance of approximately 1.75km to the southeast and one approximately 3km to the southwest of the site.

A network of surface water drains is in place across the site. These drains discharge into the estuary and the cooling water lagoon with up to thirty-six (36) known emission points present. A number of oil interceptors are incorporated into this drainage network.

### 3.2.4 Protected Areas

The NPWS<sup>3</sup> has designated the following protected areas in the vicinity of the site:

- The River Shannon and River Fergus estuary is a Special Protection Area;
- Tarbert Bay, bordering the site to the southeast, and Clonderalow Bay, located approximately 4km to the northwest of the site are proposed Natural Heritage Areas;
- The Lower Shannon River is a Special Area of Conservation.

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<sup>3</sup> <http://www.npws.ie/>

Groundwater beneath the site is protected as Drinking Water under the Water Framework Directive.

### 3.3 Site Development History

The station was constructed on agricultural land in two stages with Units 1 and 2 commissioned in 1969 and 1970 and Units 3 and 4 commissioned in 1976 and 1977. The mainland tank farm was constructed in 1974. There was a major overhaul of Units 3 and 4 undertaken in 2003 and 2004.

On site disposal of station waste was practised until the mid-1990s, with three waste disposal areas used over the site's history. The old car park was used for on-site waste disposal from when the station was first commissioned until approximately 1977. Waste oils, boiler brick and lagging and boiler washings were disposed of in this area.

An area to the west of the mainland tank farm (known as the "station dump") was used for waste disposal from 1974 until the mid-1990s. It was reported that a variety of waste materials was disposed of in this area.

The third waste disposal area was an area beside the lighthouse keeper's house on the northern portion of the island. It is thought that refractory brick and small quantities of general waste were disposed of here in the late 1970s.

### 3.4 Soil and Groundwater Contamination – Previous Reports

#### 3.4.1 Environmental Impact Assessment, ESBI, October 1997

ESBI were commissioned to "quantify the level and distribution of any 'on-site' contamination, and secondly, to obtain the necessary geological and hydrogeological data required for the station's IPC licence application".

The site works for the investigation were undertaken in November 1996 and comprised the following:

- Drilling of eighteen shell and auger boreholes and four rotary core boreholes;
- Installation of groundwater monitoring wells into sixteen of the boreholes;
- Permeability testing at selection groundwater monitoring wells; and
- Collection and laboratory analysis of soil, groundwater and surface water samples.

The report found identified six environmental 'risk areas' on the site as follows:

- Former station dump on the mainland;
- Island HFO tank farm;
- Mainland HFO tank farm;
- Light fuel oil (LFO) tank farm (i.e. diesel and propane storage area);
- Sewage treatment plant; and

- Cooling water system.

The geological profile described generally comprises very dense gravelly clay fill ranging in thickness from 0.3m to 4.1m with the maximum thickness identified in the former station dump.

These fill units overly a variable natural sequence of up to 2m thickness comprising silty gravelly clay with occasional peat. The underlying bedrock is a fractured sequence of siltstones and mudstones with a weathered gravelly interface between the residual soils and the intact bedrock.

Groundwater was identified beneath the site at depths of 2m to 5m below ground level. The predominant groundwater flow direction was towards the Shannon estuary although localised influence by surface water features was noted (e.g. groundwater beneath the former station dump flows towards a small marsh area).

Surface water samples were also collected from the areas above as well as the cooling water discharges and surface watercourses across the site.

Results from the analyses of soil samples collected from the boreholes were compared to Dutch Screening (S) and Intervention (I) guidelines. In general, the analytical results for most analytes were comparable to Dutch S guidelines. Samples from the station dump reported elevated concentrations of copper, lead nickel, vanadium and zinc.

Results from analysis of surface water and groundwater samples collected from the site were compared with the following environmental guidelines:

- EC Limit Values for drinking water (80/778/EC);
- EC Limit Values for surface water (75/440/EEC): and
- Dutch Intervention (I) guidelines.

Groundwater data was also interpreted in the context of the EC Groundwater Directive (80/68/EEC).

The investigation found that the boiler washings disposed of in the station dump were impacting the groundwater quality beneath that portion of the site. It was also found that a small HFO leak had occurred from a sump in the mainland tank farm but it was considered that the environmental impact of this leak had been minimised by diverting the flow of contaminated groundwater through an oil interceptor. These were the only two 'risk areas' identified as having an impact on the environment.

It was recommended that the practice of disposing boiler washings in the station dump be discontinued and that annual groundwater monitoring be undertaken as part of the site's environmental management system. It was also recommended that the sump in the mainland HFO tank farm be repaired and bioremediation of soil impact be undertaken.

### 3.4.2 Annual Water Quality Monitoring 1998, ESBI, March 1999

Following on from the site works carried out in November 1996 (as described in Section 3.4.1 above) ESBI were commissioned to undertake an assessment of the quality of groundwater (11 samples), surface water (13 samples) and discharge water (12 samples) on the site.

The assessment guidelines used were consistent with the previous 1997 ESBI report.

There was found to be a saline influence from the Shannon Estuary on groundwater and surface water at the site. Concentrations of polycyclic aromatic hydrocarbons (PAHs) and vanadium in groundwater and surface water across the site were found to be higher than those reported in 1997. Groundwater beneath the former station dump on the mainland was still impacted by heavy metals.

Impact on groundwater and surface water from parameters generally associated with sewage effluent was observed. This was attributed to a combination of station activities, local agricultural practices and releases from boats on the estuary.

It was found that the station was not causing any significant decrease in the quality of groundwater or surface water in the vicinity and a recommendation was made to reduce the frequency of monitoring.

### 3.4.3 Phase 1 Assessment, ESBI, November 2000

A Phase 1 environmental assessment conducted by ESBI in 2000 identified the following potential sources of soil and/or groundwater contamination:

- Asbestos (used in the construction of the two 60MW units in 1969, mainly as pipe and turbine lagging);
- Hydrocarbons (fuels and waste oils); and
- Heavy metals (mainly vanadium boiler washing and soot deposits).

Three locations across the site were identified as areas that may have been impacted by the identified sources, namely the:

- Old Car Park area;
- Former Station Dump;
- Lighthouse Keeper's compound; and
- Ramp to island tank farm.

Site records and staff interviews indicated that waste materials had been disposed of into these areas over the construction and operational history of the site with the majority of potentially contaminated materials being placed into the former station dump.

It was noted that the disposal practices into the former station dump were the most likely cause of the previously identified contamination. Almost all wastes generated at the site were disposed of in this area and included batteries, ion exchange resins, canteen waste, sewage sludge, oil filters, chemical containers, oil interceptor sediments, fluorescent tubes and lamps, oil contaminated materials, refractory brick, degreasing solvents and paint tins.

This ESBI desktop study was the earliest report sighted by URS to investigate potential impact by asbestos. It noted that following the commissioning of Generating Units 1 and 2 at the station, major overhauls were carried out at intervals of approximately 3 years. A major refurbishment was also undertaken in 1972 following an explosion at the station.

It is considered likely that asbestos wastes were generated during these major overhauls. There was no documented evidence that such asbestos was removed from site for disposal, but correspondingly no anecdotal evidence was obtained of on-site burial of asbestos. However it is considered likely that the asbestos waste was buried in the former station dump.

#### **3.4.4 Phase 2 Assessment, ESBI, March 2002**

ESBI were commissioned to undertake a Phase 2 assessment on the site in April and May 2001 and subsequently reported by ESBI in March 2002.

The assessment involved the excavation of trial pits in both the former station dump and the old car park areas. The lighthouse keeper's compound was not investigated during this assessment although the reason for this exclusion is not presented.

A total of ninety-five (95) test pits were excavated during this assessment, comprising seventy-nine (79) locations in the old car park and sixteen (16) locations in the former station dump.

A number of sediment samples were also collected from the stream at the base of the former station dump.

Analytical results from soil and sediment samples were compared with Dutch 'I' and 'S' soil guidelines as well as Irish agricultural soil ranges.

Asbestos fibres were detected in six samples each from the old car park and the former station dump. Limited occurrences of asbestos containing material (e.g. gasket) were also observed in the former station dump. Elevated concentrations of heavy metals were also reported in a number of soil samples from both areas. The heavy metals identified with elevated concentrations were consistent with those reported in earlier investigations, namely copper, nickel, vanadium and zinc.

This assessment concluded that the level of contamination identified in both parts of the site would be unlikely to impact on human receptors or the surrounding environment. However, it was also noted that, without further assessment or remedial action, that the identified impacts would preclude the future redevelopment of these parts of the site.

### **3.4.5 ESB Monitoring, 2000 and 2002**

ESB station staff undertook occasional sampling of selected groundwater wells in November 2000 and March 2002.

The 2000 samples were analysed for a wide range of organic and inorganic compounds while the 2002 samples was limited to DRO, mineral oil and PAH compounds.

Selected surface water samples were also collected across the site following a request from the EPA for additional information during the application process for an IPC licence.

The results of this monitoring confirmed the results of earlier investigations with minor heavy metal impact on surface and groundwater adjacent to the station dump and hydrocarbon impact on groundwater near the mainland tank farm pumping station.

### **3.4.6 Groundwater Investigation, Minerex Environmental Limited, February 2001**

Minerex Environmental Limited (MEL) carried out an investigation in January 2001 to assess the extent of the plume of HFO in the vicinity of the northeastern corner of the mainland tank farm. The works undertaken included the drilling and installation of seven shallow groundwater monitoring wells using window sampling drilling techniques.

The report concluded that the HFO present in the overburden had migrated towards the Shannon Estuary.

### **3.4.7 Environmental Risk Assessment and Remediation Plan, URS, July 2003**

URS was commissioned to carry out an environmental risk assessment and develop a remediation plan of four former waste disposal areas on the site as follows:

- Former station dump area on the mainland;
- Old car park area on the island;
- Lighthouse keeper's compound; and
- Ramp to the island tank farm.

The site works were carried out in December 2002 and January 2003 and included the following:

- Excavation of seventy-four trial pits;
- Excavation of five trenches;
- Drilling and installation of eight groundwater monitoring wells; and
- Collection and laboratory analysis of soil, soil leachate, groundwater and surface water samples. Analysis of asbestos in soil and suspect waste materials was also undertaken.

A preliminary assessment of soil analytical data was carried out using Dutch 'I' and 'S' soil guidelines as well as Irish agricultural soil ranges. In the absence of any assessment criteria for vanadium, the USEPA Region IX guidelines were used.

Soil leachate data was assessed using guideline values derived from European Waste Directives.

Groundwater and surface water analytical data was assessed using European Drinking Water Regulations (98/83/EC) and Irish EPA Environmental Quality Standards. Irish surface water guidelines (SI294/1989) were also used where applicable.

The preliminary assessment of asbestos in soil was based on the presence or absence of asbestos as confirmed by the laboratory.

Elevated concentrations of heavy metals, commonly associated with boiler ash, washings or grits, were identified in the four former waste disposal areas. In the former station dump, heavy metal impact to groundwater was detected at two locations. Similar impacts were not detected in adjacent monitoring wells or surface waters, indicating that the extent was limited.

Asbestos was encountered in bound form in the trial pit arisings. No disseminated asbestos fibres in soil were detected.

A conceptual site model of environmental exposure was developed based on source-pathway-receptor linkages. The resultant human health risk assessment indicated that, in all of the subject areas, the potential for exposure to asbestos fibres in both the occasional site worker and potential industrial scenarios was within the calculated guidelines, and that any risks have been further reduced by preliminary remedial actions undertaken by ESB (i.e. burial of asbestos materials under informal capping layers).

The risk assessments also concluded that, in all of the subject areas, the identified non-asbestos soil and groundwater impacts would not impact on site users or on occupants of neighbouring dwellings.

Based on a preliminary evaluation of remedial design issues, the construction of new, or the improvement to existing informal capping layers over of the former station dump, lighthouse keeper's compound and portions of the old car park was the preferred remedial option. It was recommended that the fine ash matrix in the ramp to the island tank farm be separated from the coarser material and either encapsulated in one of the areas to be capped or disposed of off-site.

The construction of a cut-off trench at the site boundary below the mainland HFO tank farm pump house was also recommended to provide containment, and to allow further evaluation of the identified oil plume at this part of the site.

### **3.4.8 Cut-Off Trench Installation, URS, November 2004**

ESBI were appointed to undertake the detailed design, procurement of contractors and construction supervision of a cut-off trench down-gradient of the observed HFO plume to the northeast of the mainland tank farm.

URS were subsequently commissioned by ESB to undertake a review of the ESBI tender documents and inspect the works during construction of the trench. Two site visits were carried out by URS during the construction works, which were undertaken in September 2004.

It was concluded that the trench was constructed in accordance with URS specifications.

### **3.4.9 Quality Assurance of Capping Works, URS, November 2007**

ESBI were appointed to undertake the detailed design, procurement of contractors and construction supervision of capping works on three areas of the site, namely the former station dump on the mainland and the old car park and lighthouse keeper's compound on the island. It was decided as part of this project to excavate the fill material used to construct the tank farm ramp and to place it in the old car park area prior to capping of the old car park area.

URS were subsequently commissioned by ESB to undertake a review of the ESBI tender documents and inspect the works during construction of the landfill caps. Four site visits were carried out by URS over the course of the construction works, which were undertaken between September 2007 and May 2007.

It was concluded that the caps were constructed in accordance with the contract documents.

## **3.5 Site Operations**

The following summary of site operations is based on information gathered during the site walkovers completed on 17 September 2008 and 6 October 2008, information provided during discussions with site personnel and information provided in the identified previous reports (see Section 3.1), in particular the ELRA prepared by TMS (TMS, 2006).

### **3.5.1 Power Generation – General Process**

The HFO fires a boiler, which produces heat. The heat is directed to the boiler tubes which generates steam. The steam is used to drive a steam turbine, which drives the electricity generators. Exhaust steam is condensed using cooling water, which is taken from the estuary, treated and discharged via the lagoon to the estuary.

Transformers are used to change the voltage of the generated electricity to make it suitable for long distance transmission.

There are four electricity-generating units on the site. The voltage of the electricity generated in Units 1 and 2 at Tarbert is raised from 10.5kV to 110kV, and in Units 3 and 4 from 20kV to 220kV. The transformers used to carry out this function are located along the southwestern wall of the turbine hall..

Electricity is distributed from the site by means of overhead lines leading away from the 110 and 220kV switching yards and an underground oil filled cable leading from the 220kV switching yard and across the Shannon Estuary.

### 3.5.2 Fuel Storage

#### *HFO Tank Farm*

HFO is pumped from the oil delivery jetty to the two tank farms located on the site. The mainland tank farm has four 40,000 tonne capacity tanks and the island tank farm has four 25,000 tonne capacity tanks, one of which is heated and lagged. All HFO tanks are contained within an earthen bund.

From the jetty, oil can be routed either westward towards the mainland or eastward towards the island tank farms. Pumphouses are located adjacent to the mainland tank farm to pump HFO to the island tank farm and adjacent to the island tank farm to pump HFO to the boilers.

The HFO pipelines are all above ground and are insulated and heated by steam.

A diesel tank farm is located on the eastern portion of the island and comprises a 347,000 litre tank and a 54,000 litre tank (understood to be redundant). The primary function of diesel on the site is for start-up of the boilers, however it is also used in station vehicles. The diesel tank farm is bunded and concrete lined. Drainage is routed through oil interceptors and discharged to the estuary.

A 4,000 litre underground diesel storage tank located outside the mechanical workshop was decommissioned in 2001 and is no longer in use.

A 3,200 litre propane tank is located outside the diesel tank farm bund to the northeast. This material is used for ignition of the boiler.

Waste oil (including HFO, diesel and lube oil) is temporarily stored in a bunded above ground storage tank with a capacity of approximately 26,000 litres located within the earthen bunded island tank farm before off-site disposal.

#### *Switching Yards*

Two transformers are located in the 220kV switching yard on the southwestern portion of the area (T2101, T2102), each associated with the transmission of power to the 110kV switching yard. These transformers are located on concrete plinths. It is understood that transformer oils used on the site have never contained PCBs.

There is also a transformer present within a bund in the 220kV switching yard (Spare TRAF0). It is understood that this bund was initially constructed in the 1960s and 1970s to the required standards of the time. It is understood that the transformer oils present in this unit have been removed. Other electrical equipment and fixtures located in the 220kV switching yard also contain cooling oils, but these are generally sealed units and potential for leakage is considered low. No evidence of staining was observed at the bases of such units.

It is understood that there is no oil filled equipment located in the 110kV switching yard.

The four main transformers for the site are located along the southwestern wall of the turbine hall. The transformers are bunded.

### 3.5.3 Water Treatment

Water is used in two separate processes on-site.

Local Authority supply water (stored in the reservoir on the eastern portion of the reservoir) is treated on-site to make it suitable for the steam feeding process. A condensate polisher (containing beds of resins) captures the soluble solids in the condensate. Dissolved solids are removed from the condensate through the addition of hydrazine. A de-aeration tank removes oxygen, nitrogen and carbon dioxide. Ammonia is also added to lower the pH.

Water for the cooling system is taken from the estuary at the cooling water inlet on the eastern area of the island and is used to condense steam from the turbines to water before being returned to the estuary, via the culverted discharge channel located on the southern portion of the island between the 110kV and 220kV switching yards. The chemicals sodium hypochlorite and sodium bromide are added to the cooling water to control biological fouling.

### 3.6 Materials Storage

Chemicals used for process water conditioning including ammonia, sodium hydroxide, sulphuric acid and phosphate are stored in the vicinity of the water treatment plant and neutralisation sump, located on the northern portion of the island.

In addition, ammonia and hydrazine are stored outside the southwestern corner of the turbine hall and algacide is stored adjacent to the water reservoir on the eastern portion of the island.

Chemicals used for cooling water conditioning include sodium hypochlorite and sodium bromide. These are stored adjacent to the cooling water intake on the eastern portion of the island.

Lubricating and hydraulic oil used in many parts of the plant is stored in a dedicated lube oil store in the central portion of the island.

Magnesium oxide and magnesium hydroxide (used as boiler additives) are stored in 200 litre drums in a bunded storage area on the northern portion of the island.

The majority of waste materials including heavy scrap metal, boiler wash effluent, waste oil and boiler slag are stored on a concrete plinth on the eastern portion of the island; this material was formerly stored on an area to the west of the island. Organic waste materials including grass and seaweed are composted to the south of the mainland HFO tank farm.

### 3.7 Reported Incidents and IPPC Compliance

A HFO release was observed on the northeastern portion of the mainland tank farm during an environmental investigation carried out by ESBI in 1997(see Section 3.4.1). The observed oil product in soil and groundwater was thought to have occurred from a leak in the stripping pump sump and some bioremediation works were undertaken. A

subsequent investigation by Minerex Environmental Limited in 2001 found that the plume extended onto the foreshore area and was migrating towards the Shannon estuary.

Following consideration of the most suitable remediation approach, URS recommended that a cut-off drain be installed to prevent the onward migration of the plume towards the estuary. This drain was installed in 2004 and it is understood that oil product is still being recovered from it. The most recent inspection carried out by the EPA in June 2008 requested that a study into the quantity and nature of oil being recovered, and a review of the remediation of the spillage be carried out.

A HFO spill measuring 25 tonnes occurred in August 2000 in the island tank farm. It was reported that this spill was contained within the earthen bund and the area was cleaned by a licensed contractor.

Effluent from the boiler wash effluent tank was accidentally discharged into the estuary in August 2008. The point of discharge is understood to have been immediately west of the neutralisation sump. The release caused a discolouration of the estuary water. The relevant authorities were notified and a clean up operation was put in place and no environmental harm was thought to have been caused.

There have been several references in the EPA inspection reports over the past number of years to ensuring the integrity of bunds on the site. In response to this, the station has implemented a bund testing programme to the satisfaction of the EPA.

The EPA has also requested that the capped former waste disposal areas on the mainland and at the lighthouse keeper's compound be fenced. This has been completed.

## 4. PHASE 2 ASSESSMENT – SCOPE AND METHODOLOGY

The environmental sampling locations were selected on the basis of the Phase 1 ESA results, observations made during site walkover inspections and information gathered from key site personnel. The locations of the soil and sediment sampling points are presented in Figure 2 while the location of the groundwater and surface water sampling points are presented in Figure 3. The capped waste disposal areas were not included in the soil assessment.

The sample locations were chosen so as to target the identified environmental 'risk areas' and to gain general coverage across the site.

### 4.1 Scope of Works

#### 4.1.1 Soil, Sediment, Groundwater & Surface Water Sampling

The scope of work carried out during the Phase 2 investigation comprised the following:

- Preliminary excavation using compressed air and vacuum extraction to a target depth of 1.2m below ground level (bgl) at nine locations (BH301 to BH305, BH307, BH308, BH310 and BH312) where the risk of striking underground services was high;
- Drilling of twenty-six boreholes (BH302 to BH305, BH307, BH308, BH310, BH312, BH313, BH315, BH316, BH320 and BH322 to BH335) to an average depth of 2.1m bgl using windowless sampling percussive drilling techniques (Terrier rig);
- Drilling and installation of nine groundwater monitoring wells (BH301, BH306, BH309A, BH311, BH314, BH317, BH318, BH319 and BH321) to an average depth of 7m bgl using air rotary drilling techniques;
- Excavation of eighteen trial pits (TP01 to TP18) to an average depth of 1.1m bgl using a 4 tonne excavator;
- Collection of soil samples from the trial pit and borehole arisings;
- Collection of near-surface soil samples using a hand auger at twelve locations (HS1 to HS12);
- 'Bracketing sampling' around hand auger location HS3;
- Collection of twenty-five sediment samples (SED01 to SED25) from the cooling water lagoon and estuary foreshore;
- Collection of groundwater samples from:
  - The nine newly installed monitoring wells (BH301, BH306, BH309A, BH311, BH314, BH317, BH318, BH319 and BH321); and
  - Fourteen existing monitoring wells (BH1, BH5, BH9, BH11, BH12, BH24, BH25, RC1, RC2, MW101, MW102B, MW103, MW202 and MW301);
- Collection of surface water samples from station discharge points at six locations (SW6, SW7, SW8, SW10, SW15 and SW25);

- Collection of surface water samples from the Shannon Estuary, the cooling water lagoon and the stream to the west of the mainland tank farm at ten locations (SW12, SW17/18, SW22, SW33 and SW37 to SW42);
- Surveying the elevations of newly installed groundwater monitoring wells (as well as existing wells where required); and
- Elevated photographic survey of the site.

The drilling, trial pitting and hand augering works took place during the weeks ending 10 and 17 October 2008. Groundwater, surface water and sediment sampling took place during the weeks ending 24 and 31 October 2008.

The well surveying and photographic survey were undertaken on 30 October 2008. Photographs are presented in Appendix A and the photograph locations are presented in Figure 4.

#### 4.1.2 Laboratory Analysis

Soil and water samples selected for chemical analysis were sent under chain of custody procedures to Alcontrol Laboratories in Dublin. Analysis for asbestos in soils was undertaken by Envirochem at their laboratory in Southampton, England. Both laboratories were UKAS accredited for the respective analysis completed by them.

The soil samples were analysed for the following parameters:

Analyte	No. of Samples – Soils (Duplicate Samples in Brackets)	No. of Samples – Sediments (Duplicate Samples in Brackets)
Total Petroleum Hydrocarbons (TPH) Criteria Working Group (CWG) Analysis	98 (10)	28 (6)
Benzene, Toluene, Ethylbenzene, Xylene (BTEX) Compounds	98 (10)	28 (6)
Total Organic Carbon (TOC)	98 (10)	28 (3)
Metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Se, Sb, V, Zn)	98 (10)	28 (3)
Speciated Polycyclic Aromatic Hydrocarbons (PAHs)	64 (7)	28 (3)
Total Phenols	60 (7)	28 (3)
Total Cyanide	60 (7)	28 (3)
Chloride, Fluoride and Sulphate	34 (3)	7
Polychlorinated biphenyls (PCBs)	41 (3)	7
Volatile organic compounds (VOCs)	8 (2)	4
Asbestos in Soil	60 (1)	21

The groundwater samples were analysed for the following parameters:

Analyte	No. of Samples - Groundwater	No. of Samples - Surface Water
TPH CWG Analysis	23	15
BTEX Compounds	23	15
Metals (As, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, V, Zn)	23	18
PAHs	23	15
Total Phenols	23	18
Total Cyanide	23	18
PCBs	19	15
VOCs	23	15
SVOCs	23	15
Anions/cations: aluminium, boron, barium, calcium, chloride, iron, potassium, manganese, sodium, sulphate, alkalinity, total hardness, total dissolved solids	23	15
Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD),	14	10
Nutrients: ammoniacal nitrogen, nitrate, nitrite, phosphate	22	18
Total and faecal coliforms	14	10

#### 4.1.3 Additional Sampling Works

Elevated hydrocarbon and PCB concentrations were detected in a groundwater sample collected from monitoring well BH318 on 24 October 2008, located immediately south of the 220kV switching yard.

Following these findings, URS was requested to undertake some additional fieldwork on 27 December 2008. These works comprised the following:

- Collection of a further groundwater sample from monitoring well BH318 to confirm the initial results; and
- Collection of additional sediment samples (SED26, 27 and 28) and a surface water sample (SW43) from the cooling water lagoon adjacent to monitoring well BH318, to assess whether the PCB concentrations observed in groundwater was impacting downgradient sediments and surface water.

A groundwater sample, surface water sample and three sediment samples were submitted to Alcontrol Laboratories (Alcontrol) in Dublin for the following analysis:

- TPH CWG analysis;
- PAHs;
- PCBs;
- VOCs including TICs; and
- SVOCs including TICs.

In addition, a duplicate groundwater sample from monitoring well BH318 was sent to Severn Trent Laboratories (STL) in Coventry, England and analysed for the same suite of parameters.

## 4.2 Phase 2 Methodology

The intrusive investigation methodologies were based on the British Standard for the Investigation of Potentially Contaminated Sites (BS 10175:2001).

### 4.2.1 Soil Sampling

A representative sample was obtained from the drill, trial pit or hand auger arisings at each sampling point and placed into laboratory supplied sample jars. Samples collected for asbestos analysis were placed in a ziploc bag. The sample containers were labelled with a unique sample number and placed in a suitable container for transportation. The field engineer wore single-use disposable nitrile gloves for each sampling event. Samples were collected at nominal depths of 0.3m, 1.0m and every metre thereafter until termination of the borehole / trial pit.

Soil from each investigation location was visually examined for evidence of contamination and screened at 1m intervals using a Photoionisation Detector (PID) for the presence of volatile compounds. All arisings were also inspected for the presence of suspected asbestos containing materials (SACM). Samples were selected for analysis based on evidence of contamination. The URS engineer noted the location on a plan, noted the sample depth and the sample number(s) and recorded the position using a portable GPS.

Field duplicate samples were collected during the soil sampling at a nominal rate of 1 duplicate for every 20 primary samples.

### 4.2.2 Windowless Sampling

Glover Site Investigation Ltd advanced boreholes at the site using windowless-sampling technology (Terrier rig). The Terrier rig allows for the non-disturbed recovery of the sub-surface lithology, with the borehole arisings encased in a single use, clear plastic liner. Representative samples with minimal loss of volatiles were collected using the grab sample method. The boreholes were advanced until natural soils under the fill units were confirmed and / or until groundwater was encountered.

#### **4.2.3 Air Rotary Drilling / Groundwater Monitoring Well Installation**

Air rotary drilling techniques were used to advance boreholes into overburden and bedrock. Air rotary drilling utilises compressed air and a 'down-hole' percussive hammer to pulverise the rock and blow the cutting back to the top of the hole. Glover Site Investigation Ltd were contracted to undertake the drilling works.

The boreholes were advanced until groundwater was encountered and a monitoring well was then installed within the completed borehole, with the well screen extended across the observed water table.

The monitoring wells were constructed using 50mm diameter HDPE standpipe with a nominal 3m - 4m screen. The screened section was surrounded by a washed gravel filter pack. A bentonite seal was placed at the surface to minimise the potential for surface and shallow groundwater entry. The monitoring well head-works were completed using flush mounted trafficable covers of steel upstanding covers, depending on the location.

Following completion, the monitoring wells were developed to enhance the wells' ability to exclude fine-grained material.

#### **4.2.4 Trial Pitting**

A four tonne excavator was used to advance the trial pits. Excavation progressed at each location until natural soils under the fill units were confirmed or until refusal on bedrock.

A URS field engineer supervised all excavation works. Each trial pit was one excavator bucket in width (nominal 750mm) and approximately 3m in length and the location was scanned using a cable avoidance tool prior to excavation. The field engineer then logged, sampled and photographed the excavation as it progressed. The excavations were backfilled with the excavated material before moving to the next location.

#### **4.2.5 Hand Augering**

A hand auger was used to collect near surface soil samples where access was restricted such as in the switching yards. The hand auger was cleaned prior to sampling. Samples were collected directly from the hand auger for logging and analysis.

#### **4.2.6 Sediment Sampling**

Sediment samples were collected from points along the estuary foreshore, the cooling water lagoon and the stream to the west of the mainland tank farm. The samples were collected directly using a trowel. An attempt was made to collect a sediment sample from the estuary floor beneath the oil jetty using a sediment sampler, however due to the depth of water at this location it was not possible.

#### **4.2.7 Groundwater and Surface Water Sampling**

Prior to groundwater sample collection, an interface probe was used to measure depth to groundwater and to assess the presence of free phase oil product in the wells. The monitoring wells were purged of at least three annular volumes of water using manual

inertial lift pumps dedicated to each well to ensure representative groundwater samples were collected.

Surface water samples were collected from station discharge points, the cooling water lagoon, the stream to the west of the mainland tank farm and the estuary. The surface water sampling points established as part of the IPPC Licence requirements for the site were used where possible.

The collected water was placed directly into laboratory supplied sample containers appropriate to the proposed analytes (with appropriate preservatives if required).

Standard environmental sampling techniques were adopted to minimise the risk of cross contamination between sampling locations and to ensure quality of samples upon receipt at the laboratory.

All sample bottles were labelled with a unique sample number for each monitoring well and placed in a cool box dedicated for water samples.

#### **4.2.8 Elevated Photograph Survey and Monitoring Well Survey**

In order to record the condition of the site prior to divestment, an elevated photograph survey was undertaken by Murphy Surveys Ltd. The elevated panoramic photographs were taken using a high spec digital camera namely a Canon G7. The camera was mounted on a telescopic mast that is capable of reaching 15m in height, thus allowing an overview of the portion of the site at the survey location. Panoramic photographs were taken at several locations around the site.

Murphy Surveys also carried out an elevation survey of each of the newly installed monitoring wells to National Grid (IG75) using a Trimble real-time RTK GPS solution.

## 5. PHASE 2 FINDINGS

### 5.1 Site Geology

The geology encountered during the assessment is presented in Appendix B.

Depth to bedrock was found to vary significantly on the island portion of the site, with rock encountered at depths of approximately 1m bgl on the central portion of the island to up to 9.3m bgl on the estuary shore (BH311). The overburden on the island generally consisted of a gravel fill material underlain by clay, with peat horizons observed at some locations.

Bedrock was encountered at one location on the mainland (BH321) at a depth of 4.1m bgl. The overburden on this part of the site was found to consist of made ground in places underlain by clayey gravels.

### 5.2 Site Hydrogeology

Shallow groundwater strikes were recorded at seven locations across the site during the assessment, generally at depths of between 1m and 2m bgl. No water strikes were recorded in bedrock. The newly installed monitoring wells were installed across both overburden and bedrock horizons.

Groundwater elevations at the site are tidally influenced and groundwater level monitoring at the site was not completed during the same tidal event. Previous investigations (ESBI, 1997) have shown the groundwater flow direction within the overburden material to flow in a radial pattern from the central portion of the island towards the estuary (following the bedrock topography). Groundwater on the mainland portion of the site is expected to flow generally northwards towards the estuary, with groundwater on the western portion of the mainland flowing towards the stream beyond the former station dump.

### 5.3 Field Evidence of Contamination

During the intrusive site investigation no evidence of contamination in the form of staining or odours was observed, with the exception of a slight hydrocarbon odour encountered at 0.3m bgl in trial pit TP08.

Fill materials were encountered at the surface across the site. In places (TP03, TP04, TP10, TP15, TP16, TP18, BH302 and BH308) waste material such as concrete, brick, timber and metal fragments were observed in this fill material.

No suspected asbestos containing material (SACM) was encountered at any of the locations.

### 5.4 Field Parameters

Measurements of temperature and redox were made on groundwater and surface water samples collected in the field. The data are presented in Tables 18 and 26 respectively. Also presented in this table are pH and electrical conductivity (EC) measurements, which were carried out by the laboratory due to malfunction of the field meter.

### 5.4.1 Groundwater

EC measurements from across the site ranged from 0.39 to 36 mS/cm, with many locations appearing to be influenced by brackish waters from the estuary. This is consistent with elevated concentrations of some of the anion and cation concentrations recorded in groundwater.

There is also potential for elevated EC observed in monitoring wells MW101, MW102 and MW301 to be related to leachate from the former waste disposal areas.

The pH of groundwater on the site was found to be neutral with an average pH of 7.06 recorded.

### 5.4.2 Surface Water

The EC measurements of surface waters are typical of estuarine waters, with the EC measurements exceeding the IGV for EC at ten locations. It is noted the sodium and chloride concentrations were also elevated, which is consistent with the presence of estuarine waters.

The surface water pH was slightly alkaline.

## 5.5 Analytical Results

### 5.5.1 Data Assessment Criteria

#### Soil and Sediment Quality

The soil analytical samples were compared with Stage 2 Generic Assessment Criteria (GAC). The GAC are conservative screening criteria protective of human health (assuming on-going industrial use of the site) and controlled waters (groundwater and surface waters).

If the concentrations are below the GAC, then the risks to human health and controlled waters are considered negligible. If the concentrations are above the GAC, there is a potential risk to human health and / or controlled waters.

URS considers that the GACs are consistent with the principles of human health and controlled waters protection in Irish Environmental Protection Agency, UK DEFRA and UK Environment Agency guidance.

Metal concentrations in soil have been compared against background data for Irish soil published by the EPA<sup>4</sup>. The published data was based on test samples collected from across the Republic of Ireland and to remove the effect of statistical outliers, the 95 percentile values were used as screening criteria. It should be noted that these 95-percentile values represent Irish background levels and are not indicators of environmental risk.

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<sup>4</sup> Environmental Protection Agency, *Towards a National Soil Database (2001-CD/S2-M2)*, 2007

The Dutch Screening Values (DSVs) and Dutch Intervention Values (DIVs) are also presented in the data tables for soil and sediment results. These criteria have been presented to provide continuity with preceding environmental assessment reports for the site and are referenced in the discussion sections where pertinent to the current works. The DIVs represent levels above which there may be a risk to human receptors and above which more detailed site-specific risk assessment may be required. With regard to PAH compounds, the Dutch criteria provide a DIV for the sum of ten PAH compounds.

The assessment of asbestos in soil was based on the presence or absence of asbestos as confirmed by a UKAS accredited laboratory. ESB has adopted a generic "asbestos-safe" level for residual asbestos fibres in soil of 0.1%. URS has verified that the adopted "asbestos-safe" level is protective of human health, based on the CLEA CLR10 human health exposure assumptions used in the UK, combined with toxicological data taken from the USEPA IRIS database.

The laboratory used to perform the analysis of soil samples indicated that a 'No Asbestos Detected' result was consistent with a detection limit of less than 0.01%, which is consistent with the method used by the laboratory (MDHS 77).

#### **Groundwater Quality**

Groundwater analytical results were assessed by comparing them with the EPA Interim Guideline Values (IGVs). These guidelines were developed using a number of existing water quality guidelines in use in Ireland including existing national Environmental Quality Standards (EQSs), proposed common indicators for the EU Groundwater Directive, Drinking Water Standards and GSI trigger values.

#### **Surface Water Quality**

The EPA EQSs, which provide guidance on the ecological quality of surface water, have been used to assess surface water results. Where available the EQSs for estuarine waters have been applied.

### **5.5.2 Soil Analytical Results**

Soil analytical data is presented in Tables 1 to 7 and a summary of the data ranges and guideline exceedances is presented in Table 28 (note Table 28 includes summary of both soil and sediment results).

There were no exceedances of the human health GACs. Exceedances of controlled waters GACs and other selected guidelines are discussed in the following.

#### **Hydrocarbon Compounds**

TPH concentrations were found to be above the GAC protective of controlled waters in sixteen of the samples collected on the island portion of the site. The majority of these exceedances were observed in the shallow fill material (i.e. <0.5m bgl). TPH concentrations were most elevated in trial pit TP08 excavated in the heavy waste storage area, where concentrations of 442mg/kg and 6,410mg/kg were detected in samples collected from 0.3m bgl and 1.0m bgl respectively.

TPH concentrations were detected above the GAC protective of controlled waters at two locations on the mainland (BH325 and BH327). Both of these samples were collected at shallow depths (0.5m bgl) from the bund floor of the mainland HFO tank farm.

Exceedence of the GACs for controlled waters indicates that the concentrations of TPH observed may pose a risk to groundwater and surface water at the site.

BTEX and MTBE compounds were not detected in the soil samples analysed and hence all concentrations were below the GACs. The GAC for benzene was calculated as being less than the MDL for this compound. As other BTEX compounds were not detected in any of the soil samples analysed, this GAC is considered to be overly conservative and no further assessment is deemed to be required.

### **PAH Compounds**

PAH compounds (including naphthalene, anthracene, fluoranthene, benzo(a)anthracene, chrysene and benzo(a)pyrene) were detected at concentrations above the GAC protective of controlled waters in nine samples collected on the island portion of the site. With the exception of one sample (TP18\_1.0m), all of these exceedances were observed in samples collected from the shallow fill material (i.e. <0.5m bgl).

PAH compounds were detected in one sample collected from the mainland portion of the site (BH325\_0.5m), with all concentrations below the GAC protective of controlled waters.

Exceedence of the GACs for controlled waters indicates that the concentrations of PAH compounds observed may pose a risk to groundwater and surface water at the site.

### **Heavy Metals**

With the exception of selenium, all heavy metal concentrations in samples collected across the site exceeded the GACs for controlled waters. In addition, with the exception of barium, chromium and selenium, the concentrations of metals observed were elevated against the EPA background values. The concentrations are discussed further in Section 5.5.

### **Other Analytes**

Phenols were detected in several soil samples collected from across the site, however no GACs were derived for comparison with the results for this compound.

Fluoride concentrations exceeded GACs for controlled waters at seventeen sampling locations on the island and at three locations on the mainland.

PCBs and VOCs were not detected in any of the soil samples analysed.

One sample (HS3) tested positive for the presence of asbestos. This sample was collected from the northernmost portion of the 220kV switching yard and was identified by the laboratory as consisting of a small piece of paper product. The four bracketing samples collected around HS3 all tested negative for the presence of asbestos. In addition, the remainder of sample HS3 was sent to another laboratory (IOM) for asbestos

quantification (the asbestos found by Envirochem was removed from the sample). No further ACM was found in this sample.

### 5.5.3 Sediment Analytical results

Sediment analytical data is presented in Tables 8 to 14 and a summary of the data ranges and guideline exceedances is presented in Table 28.

There were no exceedances of the human health GACs. Exceedances of the other selected guidelines are discussed in the following.

#### Hydrocarbon Compounds

TPH concentrations were found to be above the GAC protective of controlled waters in eight of the samples collected on the island portion of the site. The most elevated TPH concentration was observed in sediment on the estuary foreshore adjacent to the heavy waste storage area.

TPH compounds were not detected in sediment samples collected on the mainland portion of the site.

#### PAH Compounds

PAH compounds (including naphthalene, anthracene, fluoranthene and benzo(a)anthracene) were detected at concentrations above the GAC protective of controlled waters in eight sediment samples collected on the island portion of the site. The most elevated PAH concentration was detected in sample SED14 collected from the estuary foreshore on the eastern portion of the island.

PAH compounds were not detected in the sediment samples collected from the mainland portion of the site.

#### Heavy Metals

With the exception of cobalt, mercury and selenium, all heavy metal concentrations in sediment samples collected across the site exceeded the GACs for controlled waters. In addition the concentrations of antimony, molybdenum, nickel, vanadium and zinc observed were elevated against the EPA background values. The concentrations are discussed further in Section 5.5.

#### Other Analytes

Phenols were detected in several soil samples collected from across the site, however no GACs were derived for comparison with the results for this compound.

Fluoride concentrations exceeded GACs for controlled waters at seven sediment sampling locations across the site.

PCBs, VOCs and asbestos were not detected in any of the soil samples analysed.

#### 5.5.4 Groundwater Analytical Results

Groundwater analytical data is presented in Tables 15 to 22 and a summary of the data ranges and guideline exceedances is presented in Table 29. The results are discussed in the following.

##### Hydrocarbon Compounds

Hydrocarbon compounds in the TPH aromatic and aliphatic C<sub>12</sub>-C<sub>16</sub> fraction were detected at a concentration of 563µg/l in the groundwater sample taken from monitoring well BH318 to the southeast of the 220kV switching yard.

TPH in the C<sub>12</sub>-C<sub>21</sub> fraction was detected in sample BH24 on the mainland portion of the site at a concentration of 713µg/l.

TPH concentrations in both of these samples exceeded the IGV for TPH of 10µg/l.

TPH, BTEX or MTBE compounds were not detected in any of the remaining groundwater samples analysed.

##### PAH Compounds

Sum of 16 PAHs of 0.668µg/l and 0.835µg/l were detected in samples BH318 and BH24 respectively. The IGVs for individual PAHs (where present) were not exceeded. PAHs were not detected in the remaining groundwater samples analysed.

##### Heavy Metals

Metal concentrations in excess of the IGVs were detected for arsenic, barium, lead and nickel.

There are no IGVs for antimony, cobalt, molybdenum, selenium and vanadium, however the concentrations of vanadium in monitoring wells BH1 and BH5 adjacent to the former station dump were an order of magnitude greater than concentrations observed in other wells.

The concentrations observed are discussed further in Section 5.6.

##### Anions and Cations

Anions and cations were detected above the IGVs in all of the samples analysed, with the exception of BH25. The concentrations observed are discussed further in Section 5.6.

##### Nutrients

Concentrations of ammonia, nitrite and phosphate were detected above the IGVs in several of the samples analysed, with the exception of BH25. The concentrations observed are discussed further in Section 5.6.

##### Other Analytes

VOCs were not detected in any of the groundwater samples analysed.

The semi-volatile compound bis(2-ethylhexyl)phthalate was detected in groundwater sample BH318 at a concentration of 1µg/l. This was below the IGTV of 8µg/l. There were also some semi-volatile compounds reported as tentatively identified compounds (TICs) in samples BH318, BH9 and BH301, BH309A and MW202.

A concentration of total PCBs (7 congeners) of 0.333µg/l was detected in groundwater sample BH318. This exceeded the IGTV of 0.01µg/l. PCBs were not detected in the other groundwater samples.

Phenols were detected at concentrations above the IGTV of 0.0005mg/l in twenty-one of the twenty-three groundwater samples analysed.

Faecal coliforms were detected in eleven of the fourteen samples analysed. Total coliforms were detected in twelve of the fourteen samples analysed. These positive detections were above the IGTV for total and faecal coliforms of 0cfu/100ml.

### 5.5.5 Surface Water Analytical Results

Surface water analytical data is presented in Tables 23 to 27 and a summary of the data ranges and guideline exceedances is presented in Table 29. The results are discussed in the following.

#### Hydrocarbon Compounds

Hydrocarbon compounds were not detected in any of the surface water samples collected, therefore all results were below the adopted guideline values.

#### PAH Compounds

PAH compounds were not detected in any of the surface water samples collected, therefore all results were below the adopted guideline values.

#### Heavy Metals

Metal concentrations in excess of the EQSs were detected for arsenic, selenium and zinc.

There are no EQSs for cobalt and vanadium, however cobalt was not detected and vanadium concentrations were generally low.

The concentrations observed are discussed further in Section 5.6.

#### Anions and Cations

Anions and cations were detected above the respective EQS values in several of the surface water samples analysed. The concentrations observed are discussed further in Section 5.6.

#### Nutrients

Nitrite and phosphate were detected above the IGTVs in several of the samples analysed. The concentrations observed are discussed further in Section 5.6.

### Other Analytes

VOCs, SVOCs and PCBs were not detected in any of the surface water samples analysed.

Phenols were detected at concentrations above the EQS of 0.0005mg/l in almost all of the surface water samples analysed.

BOD was detected at concentrations above the EQS of 4mg/l in three surface water samples.

Total coliforms were detected in two of samples analysed at concentrations above the EQS of 5,000cfu/100ml.

### 5.5.6 Additional Sampling Works

No field evidence of contamination was observed during collection of the sediment or surface water samples. A slight sheen was observed on the groundwater during purging and sampling of monitoring well BH318. No odours were observed during sampling.

Analytical results for all groundwater monitoring events undertaken at BH318 (October 2008 and December 2008) and the additional sediment and surface water samples collected from the cooling water lagoon (December 2008) are presented in Tables 30 to 43.

#### Groundwater

A PCB concentration (total of 7 congeners) of 0.174µg/l was detected in the groundwater sample collected from BH318. This compares to a PCB concentration of 0.333 µg/l detected in the October 2008 sampling event. PCB concentrations in both samples were above the EPA Interim Guideline Values (IGVs) for groundwater of 0.01 µg/l.

PCBs reported as congeners were not detected in the duplicate sample analysed by STL, however the detection limit for the method used by STL (0.1µg/l) was higher than the concentrations reported by Alcontrol. A PCB concentration (reported as an aroclor) of 1.4µg/l was detected by STL, with the analyst commenting that the compounds detected were consistent with Aroclor 1254.

TPH, PAH and SVOC compounds (as TICs) were also detected in groundwater at BH318. TPH concentrations detected by STL (135µg/l) were above the IGTV of 10µg/l. All remaining contaminant concentrations were below their respective IGTVs (where present).

#### Surface Water

TPH, PAHs, PCBs, VOCs and SVOCs were not detected in the surface water sample SW43 collected from the cooling water lagoon adjacent to monitoring well BH318. Hence all concentrations were below the EPA Environmental Quality Standards (EQS) for surface water (where available).

## Sediment

Concentrations of TPH, PCBs, VOCs and SVOCs were not detected in sediment samples SED26, SED27 and SED28 collected from the cooling water lagoon adjacent to monitoring well BH318.

Low-level concentrations of PAH compounds were detected in samples SED26 and SED27. The concentrations observed were consistent with the PAH concentrations detected in the lagoon sediments during the October 2008 investigation.

### 5.5.7 Data Validation

The relative percentage differences (RPDs) between the nine primary and duplicate soil samples are shown in Table 6 and the RPDs between the three primary and duplicate sediment samples analysed are shown on Table 13. The RPDs indicate the degree to which the primary and duplicate sample results differ. An RPD of greater than 40%, where both the primary and duplicate concentrations are more than 10 (ten) times greater than the MDL, indicates an unacceptable difference between the primary and duplicate samples.

The RPDs were acceptable for all soil and sediment analytes except TPH (three samples), benzo(a)anthracene (one sample), barium (one sample), cobalt (one sample), lead (two samples), nickel (one sample), vanadium (three samples) and zinc (one sample). This may be attributed to sample heterogeneity.

The anion – cation (ionic) balance calculations for the groundwater and surface water samples analysed are presented in Appendix C. According to the laboratory, an imbalance in the range of +/- 10-15% is considered normal.

An ionic balance percentage difference of greater than 15% was calculated in groundwater samples BH11, BH25 and BH318 and in surface water sample SW39. Anion and cation analytical data for these samples has subsequently been withdrawn from the dataset. The ionic balance calculations for the remaining samples are within acceptable ranges indicating that the data is suitable for interpretative use.

## 5.6 Discussion

There were no exceedances of the GACs protective of human health in any of the targeted media; consequently the concentrations of analysed parameters are not considered to pose a risk to current or future users of the site in a continued industrial land use scenario.

There were some exceedances of the GACs protective of controlled waters for soil and sediment. There were also some exceedances of the IGVs protective of groundwater and the EQSs protective of surface water. These exceedances are discussed below.

## 5.6.1 Soil Quality

### Hydrocarbon and PAH Compounds

A PID reading of 57ppm and a slight hydrocarbon odour was recorded in sample TP08\_1.0m. This is consistent with the elevated hydrocarbon concentrations seen in both samples TP08\_0.3m (441.75mg/kg) and TP08\_1.0m (6409.476mg/kg). This was the only location where hydrocarbon concentrations were found to be in excess of the DIV of 5,000mg/kg. This trial pit was excavated in the heavy waste storage area, inferring that the hydrocarbon impact in this area occurred as a result of hydrocarbon leaks from the plant stored in this area in the past. The impact is thought to be localised as hydrocarbon compounds were not detected in groundwater in the vicinity. Further investigation should be undertaken to assess the extent of the observed hydrocarbon impact and the need for remedial action.

The remaining relatively low concentrations of TPH were detected primarily in fill material at shallow depths of less than 0.5m bgl on the island portion of the site, with hydrocarbon concentrations found to be in excess of the DSV of 50mg/kg at five locations (BH301, BH305, BH306, TP03 and TP09). PAH compounds were also reported in a number of the same samples at shallow depth. The presence of these compounds does not appear to be associated with the fuel distribution network on the site. It is more likely to be indicative of seepage from the site surface water drainage system or the composition of the fill materials used on this portion of the site.

The controlled water GAC and DSV exceedances observed in soil on the mainland (samples BH325\_0.5m and BH327\_0.5m) were both from samples collected from the surface of the HFO tank farm floor. The presence of these compounds may be related to the spill that occurred within the bund in 1996. However, given the fact that the samples were collected at the surface of the earthen bund and the low concentrations detected, the occurrence of these compounds are not considered to be a cause for concern.

The presence of hydrocarbon and PAH compounds in soil at concentrations above the GACs protective of controlled waters indicates that groundwater and surface water at the site may be at risk. Given that these analytes (with the exception of groundwater samples collected from monitoring wells BH318 and BH24, discussed further in Section 5.5.3) were generally not detected in shallow groundwater or surface water on the site, this risk is considered to be low. Nonetheless, more detailed assessment of this risk is recommended.

Two boreholes (BH329 and BH330) were completed down-gradient of the cut-off drain on the mainland portion of the site, installed in 2004 following the discovery of HFO contamination from the stripper pump sump on the northeastern portion of the mainland tank farm. No evidence of hydrocarbon contamination was observed in the borehole arisings and hydrocarbon compounds were not detected in any of the four soil samples collected. In addition, concentrations of nickel and vanadium (commonly found in HFO) were not detected above the Dutch target values in any of the soil samples analysed from these boreholes. This indicates that the interceptor trench has been effective in limiting the migration of HFO towards the River Shannon.

## Heavy Metals

Almost all of the metal concentrations in soil exceeded the respective controlled water GACs (the only exception being selenium) and a number of metal concentrations (antimony, arsenic, cadmium, cobalt, copper, lead, molybdenum, nickel, vanadium and zinc) were above the published EPA background values. In addition, a number of metal concentrations (antimony, arsenic, barium, cadmium, cobalt, copper, lead, mercury, molybdenum, nickel, vanadium and zinc) exceeded the respective DSVs. The DIVs for copper, vanadium, nickel and zinc in soil were exceeded at three locations on the site (HS12, TP13 and TP15).

The presence of nickel and vanadium in soil may be related to historical disposal of boiler washings on the site, as these metals are known impurities in the fuel oil burned on the site. In addition, elevated metal concentrations may be attributed to the presence of waste metal fragments in the fill material used on areas of the site.

The EPA report<sup>5</sup> on background metal concentrations in Ireland identifies arsenic, cadmium and copper as occurring at naturally elevated concentrations in the North Kerry region. This may explain the slightly elevated concentrations of these metals.

Considering that a number of these metals were also detected in groundwater and surface water samples (arsenic, barium, lead, nickel and zinc), the observed metal concentrations in soil are considered to pose a potential risk to controlled waters on the site (i.e. groundwater and the Shannon Estuary) and as such, more detailed assessment is recommended.

## Other Analytes

Total phenols were detected at concentrations slightly above the laboratory detection limit of 0.01mg/kg at locations across the site. The observed concentrations were slightly above the DSV in fifteen of the samples analysed, however all concentrations (the highest being 1.63mg/kg) were below the DIV of 40mg/kg. It is therefore considered that the concentrations observed are not a cause for concern.

Fluoride concentrations that exceeded the screening level GACs for controlled waters in soils are not considered to be a significant issue. They are widely distributed across the site through developed and undeveloped areas, which is not consistent with potential point source (or sources) on site. Furthermore, the GACs are conservative screening criteria and the exceedances recorded for fluoride were marginal.

## 5.6.2 Sediment Quality

### Hydrocarbon and PAH Compounds

With the exception of sediment sample SED05, the concentrations of TPH detected in sediment samples collected across the site were low (less than 1mg/kg) and all concentrations were below the DSV.

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<sup>5</sup> Environmental Protection Agency, *Towards a National Soil Database (2001-CD/S2-M2)*, 2007

Sediment sample SED05 was collected from the estuary foreshore immediately north of the heavy waste storage area. As outlined in Section 5.5.1 above, localised hydrocarbon impact was observed in a trial pit excavated in this area and the elevated concentrations observed in the sediment on this portion of the island may be related to this hydrocarbon source.

PAH compounds, in particular benzo(a)anthracene, were detected at eight sediment sampling locations on the island portion of the site. This included sample SED21, which was taken off-site adjacent to the Tarbert to Killimer ferry jetty. Given that PAH compounds in excess of the controlled water GACs were only detected on the island portion of the site and not the mainland, it is possible that discharges from the station are impacting on sediment quality. However, it is also possible that emissions from boats using the estuary are a source of the observed PAHs.

A more detailed assessment of the potential risk posed by these compounds to controlled waters at the site is recommended.

### **Heavy Metals**

Metal concentrations in sediment were in excess of the controlled waters GACs for a number of metals. A small number of metal concentrations (antimony, nickel, molybdenum, vanadium and zinc) were above the published EPA background values. The DSVs were also exceeded for a number of metals. The only metal to exceed the respective DIV was vanadium at three locations on the island portion of the site (SED03, SED06 and SED14).

The elevated vanadium concentrations in samples SED03 and SED14 may be as a result of a boiler washings release that occurred in August 2008 onto the portion of the estuary foreshore where these samples were collected.

The presence of nickel and vanadium in sediments on the site can generally be attributed to leaching from boiler residues disposed of on site.

Overall, analysis has shown that the metal concentrations in sediment pose a potential risk to controlled waters (i.e. the Shannon Estuary) and as such, more detailed assessment is recommended.

### **Other Analytes**

Phenol and fluoride concentrations in sediment samples were similar to those observed in soil at the site and in terms of a risk to controlled waters they are not considered a cause for concern.

## **5.6.3 Groundwater Quality**

### **Hydrocarbon and PAH Compounds**

The analytical results for the groundwater sample collected from monitoring well BH318 located to the southeast of the 220kV switching yard indicate that there is slight groundwater impact in this area, with low-level detections of TPH, PAHs, hydrocarbon

related SVOCs (including TICs) and PCBs present. TPH and PCB concentrations in this sample were in excess of their respective IGVs.

The SVOC compound detected (bis(2-ethylhexyl)phthalate, also known as DEHP) is commonly found in capacitors. The concentration detected (1µg/l) was below the IGV of 8µg/l.

The presence of these compounds may indicate some impact from transformer oils stored on the 220kV compound or the oil filled cable that runs between the compound and monitoring well BH318, although it is understood that the transformer oils used on site did not contain PCBs. The presence of the observed compounds may also be as a result of the composition of the fill materials used in that portion of the site. These compounds were not detected in any of the other groundwater or surface water samples collected on the island portion of the site. The findings of further groundwater sampling undertaken at monitoring well BH318 in December 2008 are described below in Section 5.6.5. In addition, a letter report issued to ESB on 3 February 2009 is contained in Appendix D.

TPH concentrations were detected above the IGV in a sample collected from monitoring well BH24 located downgradient of the oil interceptor trench on the mainland. Low-level concentrations of PAHs were also detected. These concentrations may indicate impact from the oil product known to be present in soil on that portion of the site. This well should be included in any future groundwater monitoring strategy for the site.

### **Heavy Metals**

The elevated metal concentrations in groundwater were mostly detected adjacent to capped waste disposal areas (MW102, MW202, BH1 and BH5) or areas where fill materials were observed at the surface (RC2, BH318, BH321) and are likely to be as a result of leaching from these horizons.

In particular, the elevated vanadium concentrations in monitoring wells BH1 and BH5 are likely to be attributed to the boiler washings known to have been disposed of in the former station dump.

### **Other Analytes**

The detection of elevated concentrations of anions and cations in groundwater in several of the wells is related to brackish nature of the groundwater, caused by the site's proximity to the estuary.

Nitrogen compounds and phosphate were detected above their respective IGVs in several locations across the site and were found to be most elevated in the groundwater wells located in or close to the former waste disposal areas. The more elevated concentrations are probably due to leaching from these areas.

Total phenol concentrations in shallow groundwater were above the IGV in most of the samples analysed. The levels detected were only slightly above the laboratory MDL and are not considered to pose a risk to the underlying bedrock aquifer.

Elevated concentrations of coliforms were detected in groundwater across the site. The occurrence of these coliforms may be associated with sewage effluent from the treatment systems on site or from local agricultural practices. However their presence on a widespread basis across the site suggests a regional influence rather than a point source on the site.

#### 5.6.4 Surface Water Quality

##### Hydrocarbon and PAH Compounds

Hydrocarbon or PAH compounds were not detected in any of the surface water samples analysed, indicating that the low-level impact observed in soil and sediment is not having a significant impact on surface water.

##### Heavy Metals

Selenium was detected at concentrations above the EQS value of 0.02mg/l in seven surface water samples collected directly from either the estuary or cooling water lagoon.

Given that selenium was not detected in any of the soil or sediment samples analysed during this ESA, and selenium was not detected above the EQS in any of the samples collected from station discharge points, it is considered unlikely that the selenium concentrations observed are not derived from activities on the site.

Concentrations of arsenic and zinc were detected at concentrations slightly above the EQS in surface water sample SW7. This sample was collected from a shallow groundwater seepage at the surface of the estuary foreshore and may be attributed to the presence of shallow fill materials on this portion of the island. Given the concentrations observed and the dilution capacity of the River Shannon, these concentrations are not considered to be a significant issue.

##### Other Analytes

The detection of elevated concentrations of anions and cations in surface water in several of the sampling locations is related to brackish nature of the estuarine water and is not considered to be environmentally significant.

The elevated phosphate concentrations in surface water were observed in samples collected from the estuary foreshore and are likely to reflect impact on the estuary from agricultural practices in the region.

Nitrite, BOD and total coliforms were detected above their respective EQS values in sample SW10 collected from the discharge point of the sewage treatment plant on the northern portion of the island. This indicates that maintenance of the sewage treatment plant may need to be undertaken.

Elevated coliform levels were also detected in sample SW15 collected from a discharge point to the north of the island HFO tank farm. The origin of this coliform contamination is not known.

### **5.6.5 Additional Sampling Works**

The presence of PCBs in the groundwater sample collected from monitoring well BH318 on 27 December 2009 confirms the finding of the initial groundwater monitoring event undertaken on 24 October 2008 for this well (see Appendix D).

It is understood that PCB containing oils have never been used at the site. In addition, PCBs were not detected in groundwater in any of the other twenty-four monitoring wells sampled at the site during the 2008 ESA or in any of the soil, sediment or surface water samples collected during the initial investigation in October 2008 or the additional sampling works undertaken in December 2008.

Given these findings, it is likely that the PCB impact is localised in the vicinity of monitoring well BH318. However the installation of additional groundwater monitoring wells in the vicinity of BH318 should be undertaken in order to further assess the extent of PCBs in groundwater at this part of the site. In addition, it is proposed that trial pits be excavated in the vicinity of monitoring well BH318 to assess the source of the PCB impact.

## 6. CONCLUSIONS

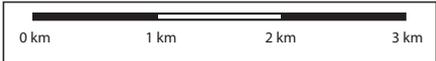
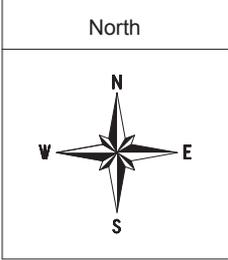
Based on the results and observations of the Phase 1 and 2 ESA, URS has drawn the following conclusions:

- From the perspective of human health and potential risks posed by environmental soil, sediment, groundwater and surface water quality to site users, the site is considered suitable for continued industrial use.
- In general, the analytical results for most soil and sediment analytes were comparable to Dutch screening values. There were exceedances of the Dutch intervention values for hydrocarbons (mineral oil), copper, vanadium, nickel and zinc at four locations across the site.
- A conservative assessment of the soil analytical data (using GACs) collected during the ESA identified potential risks to controlled waters (i.e. groundwater and surface water) from a number of metals across the entire site as well as TPH and PAH compounds on the island portion of the site. Their presence warrants a quantitative risk assessment (QRA) to assess in more detail potential risks to the local ecosystems (estuary). Such an assessment may comprise additional sampling, but would be largely desktop based. It is considered unlikely that these findings represent significant liability issues.
- A localised area of hydrocarbon impact was observed in soil and sediment in the vicinity of the heavy waste storage area on the island portion of the site. Further investigation should be undertaken to assess the extent of the observed hydrocarbon impact and the need for remedial action.
- Elevated hydrocarbon and polychlorinated biphenyl (PCB) concentrations were detected in a groundwater sample collected from monitoring well BH318 located immediately south of the 220kV switching yard. It is understood that PCBs were never detected in the main transformers at Tarbert. In addition, PCBs were not detected in any of the other soil, sediment, groundwater or surface water samples analysed.
- Further groundwater sampling carried out at monitoring well BH318 in December 2008 confirmed the findings of the initial groundwater monitoring event. The installation of additional groundwater monitoring wells in the vicinity of BH318 should be undertaken in order to further assess the extent of PCBs in groundwater at this part of the site. In addition, trial pits should be excavated in the vicinity of monitoring well BH318 to assess the source of the PCB impact.
- TPH concentrations were detected above the IGV in a sample collected from monitoring well BH24 located downgradient of the oil interceptor trench on the mainland. Low-level concentrations of PAHs were also detected. These concentrations may indicate impact from the oil product known to be present in soil on that portion of the site. This well should be included in any future groundwater monitoring strategy for the site.

- The former waste disposal areas (which were capped in 2006) appear to be impacting on groundwater quality beneath the site, with elevated levels of nitrogen compounds observed in monitoring wells installed in and adjacent to these areas. Impact on controlled waters from these areas should be assessed as part of the ongoing groundwater and surface water monitoring programme at the site.
- Elevated concentrations of coliforms were detected in groundwater and surface waters across the site. The occurrence of these coliforms may be associated with sewage effluent from the treatment systems on site or from local agricultural practices. However their presence on a widespread basis across the site suggests a regional influence rather than a point source on the site.
- The presence of asbestos containing materials (ACM) in the subsurface is considered unlikely, except in the capped waste disposal areas, where ACM is known to exist.

In summary, no remedial action is currently considered necessary at the site under a continued industrial land use scenario, from the perspective of environmental soil and groundwater quality; however further assessment of a number of issues is recommended.

# Figures



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CLIENT  
**ESB**

PROJECT LOCATION  
**PHASE 2 ESA TARBERT**

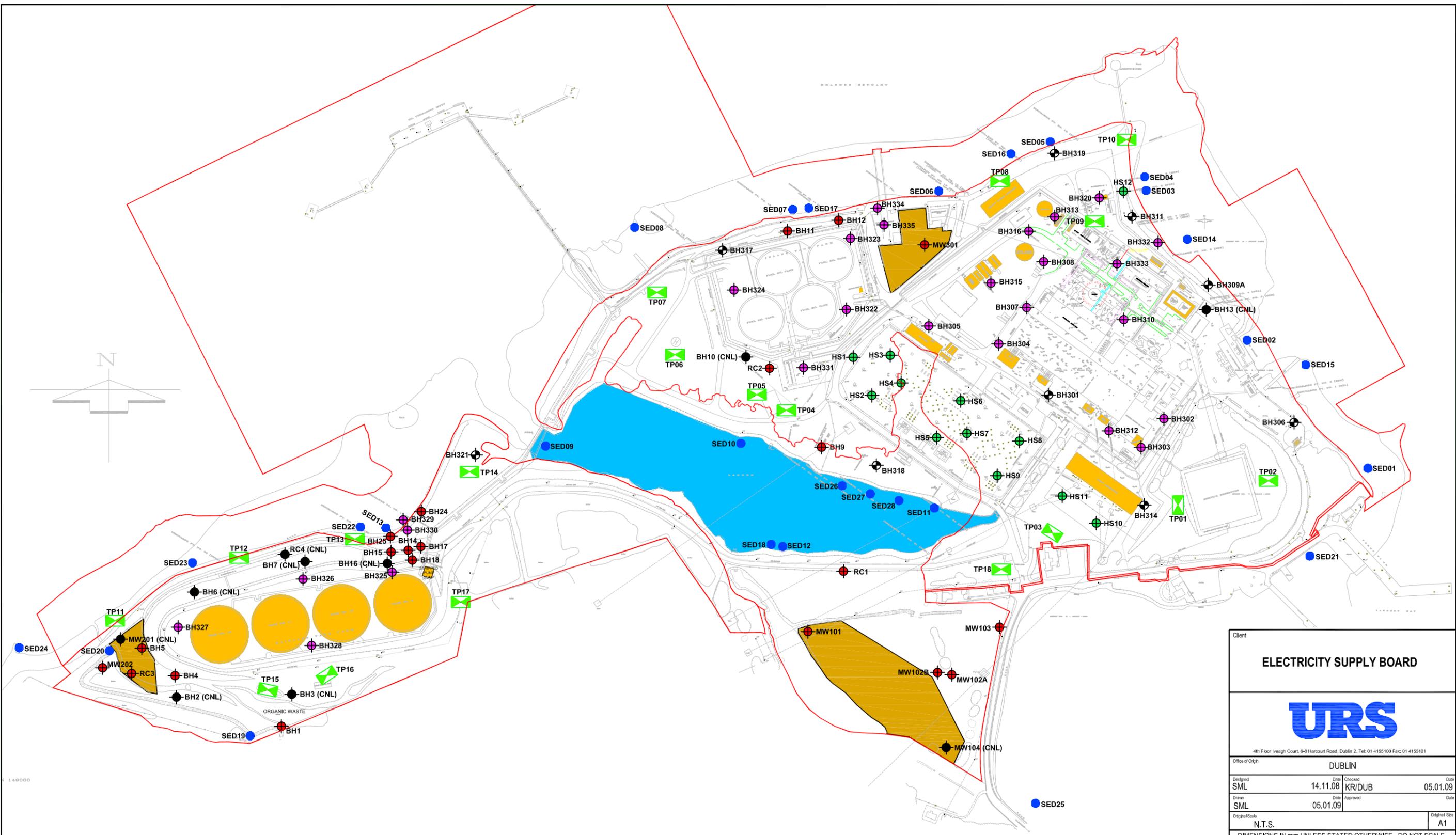
DRAWING TITLE  
**FIGURE 1 - SITE LOCATION PLAN**

ENVIRONMENTAL CONSULTANTS



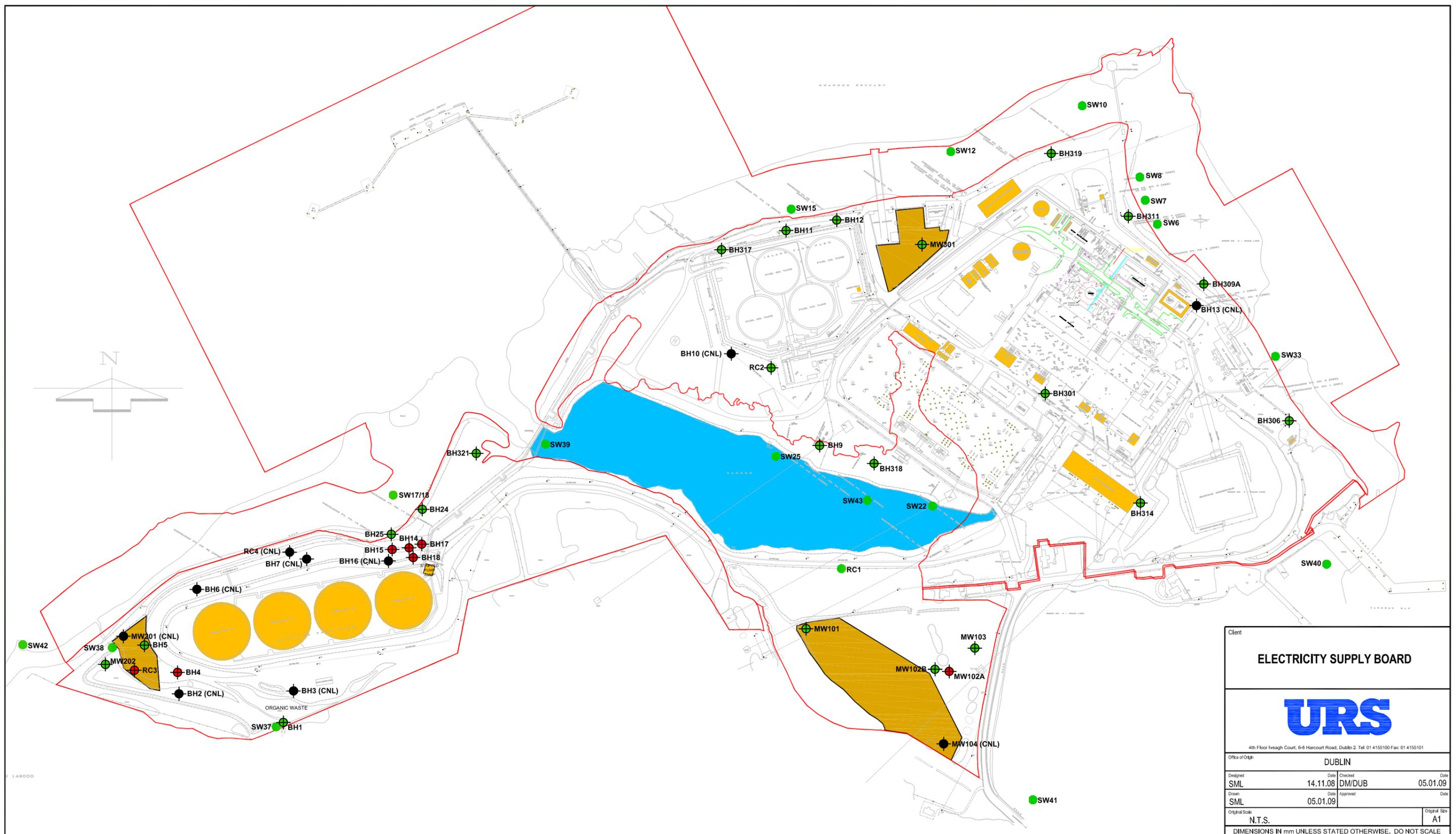
Iveagh Court, 6-8 Harcourt Road, Dublin2  
 TEL +353 1 4155100 FAX +353 1 4155101

DRAWN SML	TRACED	CHECKED DM	APPROVED DM/DUB	DATE OCT 2008
SCALE AS SHOWN	Job No. <b>49341640</b>		REV. A	



- LEGEND**
- TERRIER RIG
  - BOREHOLE / MONITORING WELL LOCATION
  - EXISTING MONITORING WELL LOCATION
  - HAND EXCAVATION / SAMPLE
  - SEDIMENT SAMPLE LOCATION
  - TRIAL PIT LOCATION
  - CAPPED DISPOSAL AREAS
  - COULD NOT LOCATE WELL - PRESUME DESTROYED

Client			
<b>ELECTRICITY SUPPLY BOARD</b>			
<small>4th Floor Iveagh Court, 6-8 Harcourt Road, Dublin 2, Tel: 01 4155100 Fax: 01 4155101</small>			
Office of Origin <b>DUBLIN</b>			
Designed	Date	Checked	Date
SML	14.11.08	KR/DUB	05.01.09
Drawn	Date	Approved	Date
SML	05.01.09		
Original Scale			Original Size
N.T.S.			A1
DIMENSIONS IN mm UNLESS STATED OTHERWISE. DO NOT SCALE			
Project			
<b>PHASE 2 ESA TARBERT</b>			
Drg. Title			
<b>FIGURE 2 _ SITE LAYOUT PLAN SHOWING SOIL AND SEDIMENT SAMPLE LOCATIONS</b>			
Drg. No.	Rev.	Sheet No.	
<b>49341640</b>			



**LEGEND**

- SURFACE WATER SAMPLE LOCATION
- EXISTING BOREHOLE/MONITORING WELL LOCATION - NO SAMPLE COLLECTED
- COULD NOT LOCATE WELL - PRESUME DESTROYED

Client			
<b>ELECTRICITY SUPPLY BOARD</b>			
<b>URS</b>			
<small>4th Floor Iveagh Court, 6-8 Harcourt Road, Dublin 2. Tel: 01 4155100 Fax: 01 4155101</small>			
Office of Origin			
DUBLIN			
Designed	Date	Checked	Date
SML	14.11.08	DM/DUB	05.01.09
Drawn	Date	Approved	Date
SML	05.01.09		
Original Scale	N.T.S.		Original Spc
DIMENSIONS IN mm UNLESS STATED OTHERWISE. DO NOT SCALE			
Project			
<b>PHASE 2 ESA TARBERT</b>			
Drg. Title			
<b>FIGURE 3 _ SITE LAYOUT PLAN SHOWING GROUNDWATER AND SURFACE WATER SAMPLE LOCATIONS</b>			
Drg. No.	Rev.	Sheet No.	
<b>49341640</b>			



CLIENT  
**ELECTRICITY SUPPLY BOARD**

DRAWING TITLE  
**FIGURE 4 - PANORAMIC AND GROUND LEVEL PHOTOGRAPHIC SURVEY LOCATIONS**

PROJECT  
**PHASE 2 ESA TARBERT**

DRAWN SML	TRACED	CHECKED KR	APPROVED DM/DUB	DATE JAN '09
SCALE AS SHOWN	Job No: <b>49340640</b>			REV A

Notes:

-  SITE BOUNDARY LINE
-  URS GROUND LEVEL PHOTOGRAPH LOCATION
-  MURPHY'S SURVEY LTD PANORAMIC PHOTOGRAPHIC SURVEY LOCATION

STATUS  
**DRAFT**

ENVIRONMENTAL CONSULTANTS



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# Tables

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

220kV Switching Yard

Sample Type								Soil							
Sample ID								HS2	HS3	HS4	HS5	HS6	HS7	HS8	HS9
Depth (m)								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Date								15-Oct-08							
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value									
<b>Hydrocarbons</b>															
<b>Aromatics</b>															
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-	-	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-	-	-	-	-	-	-
<b>Aliphatics</b>															
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	-	-	-	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	<b>5000</b>	-	-	-	-	-	-	-	-	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	-	-	-	-	-	-	-	-
<b>BTEX</b>															
Benzene	mg/kg	0.01	0.001	1.5	0.01	<b>1</b>	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	<b>130</b>	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	<b>50</b>	-	-	-	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	<b>25</b>	-	-	-	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	<b>100</b>	-	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

110 kV Switching Yard

Sample Type							Soil	Soil	Soil
Sample ID							HS10	HS11	QA6 - Duplicate of HS11
Depth (m)							0.1	0.1	0.1
Date							15-Oct-08	15-Oct-08	15-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-
<b>Aliphatics</b>									
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	<b>5000</b>	-	-	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	-	-
<b>BTEX</b>									
Benzene	mg/kg	0.01	0.001	1.5	0.01	<b>1</b>	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	<b>130</b>	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	<b>50</b>	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	<b>25</b>	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	<b>100</b>	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Island Area

Sample Type								Soil								
Sample ID								HS1	BH301	BH302	BH302	BH303	BH304	BH305	BH306	BH306
Depth (m)								0.1	0.50	0.50	1.0M	0.5M	0.5M	0.50	0.4	1.0
Date								15-Oct-08	13-Oct-08							
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value										
<b>Hydrocarbons</b>																
<b>Aromatics</b>																
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	-	-	-	-	-	-	0.506	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	-	-	-	-	-	-	0.562	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-	-	-	-	-	0.107	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-	-	-	-	-	1.175	-	-
<b>Aliphatics</b>																
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	45	-	-	-	14	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-	-	-	-	54	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	100	-	-	-	-	51	-	740	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	5000	-	100	45	-	-	-	119	-	740	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	100	45	-	-	-	119	1.175	740	-
<b>BTEX</b>																
Benzene	mg/kg	0.01	0.001	1.5	0.01	1	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	130	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	50	-	-	-	-	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	25	-	-	-	-	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	100	-	-	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Island Area

Sample Type	Soil													
Sample ID	BH307	BH308	BH309	BH309	BH310	BH310	BH312	BH313	BH313					
Depth (m)	0.5	0.50	0.5	2.0	0.5	1.2	0.5	0.5	2.5					
Date	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08				
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value								
<b>Hydrocarbons</b>														
<b>Aromatics</b>														
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-	-	-	-	-	-
<b>Aliphatics</b>														
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	-	-	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	<b>5000</b>	-	-	-	-	-	-	-	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	-	-	-	-	-	-	-
<b>BTEX</b>														
Benzene	mg/kg	0.01	0.001	1.5	0.01	<b>1</b>	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	<b>130</b>	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	<b>50</b>	-	-	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	<b>25</b>	-	-	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	<b>100</b>	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Island Area

Sample Type															
Sample ID															
Depth (m)															
Date															
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil BH315	Soil BH315	Soil BH316	Soil BH316	Soil BH320	Soil BH320	Soil BH322	Soil BH322	Soil BH323
<b>Hydrocarbons</b>															
<b>Aromatics</b>															
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-	-	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-	-	-	-	-	-	-
<b>Aliphatics</b>															
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	-	-	-	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	<b>5000</b>	-	-	-	-	-	-	-	-	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	-	-	-	-	-	-	-	-
<b>BTEX</b>															
Benzene	mg/kg	0.01	0.001	1.5	0.01	<b>1</b>	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	<b>130</b>	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	<b>50</b>	-	-	-	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	<b>25</b>	-	-	-	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	<b>100</b>	-	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Island Area

Sample Type								Soil								
Sample ID								BH323	BH324	BH324	BH331	BH331	BH332	BH332	BH333	BH333
Depth (m)								1.0	0.5	2.0	0.5	2.0	0.5	1.0	0.5	2.0
Date								13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value										
<b>Hydrocarbons</b>																
<b>Aromatics</b>																
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	-	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	-	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-	-	-	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
<b>Aliphatics</b>																
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	<b>5000</b>	-	-	-	-	-	-	-	-	-	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
<b>BTEX</b>																
Benzene	mg/kg	0.01	0.001	1.5	0.01	<b>1</b>	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	<b>130</b>	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	<b>50</b>	-	-	-	-	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	<b>25</b>	-	-	-	-	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	<b>100</b>	-	-	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Island Area

Sample Type	Soil													
Sample ID	QA7 - Duplicate of BH333	TP01	TP02	TP02	TP03	TP04	TP05	TP06	TP06	TP06				
Depth (m)	2.0	0.4	0.3	1.0	0.3	0.4	0.4	0.3	0.6					
Date	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08				
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value								
<b>Hydrocarbons</b>														
<b>Aromatics</b>														
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	-	-	0.139	-	-	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	0.163	-	-	0.123	-	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	0.163	-	-	0.262	-	-	-
<b>Aliphatics</b>														
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-	19	-	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	-	-	170	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	5000	-	-	-	189	-	-	-	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	0.163	-	-	189	0.262	-	-
<b>BTEX</b>														
Benzene	mg/kg	0.01	0.001	1.5	0.01	1	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	130	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	50	-	-	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	25	-	-	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	100	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Island Area

Sample Type	Soil									
Sample ID	TP07	TP08	TP08	QA8 - Duplicate of TP08	TP08	TP09	TP09	TP10	TP10	
Depth (m)	0.3	0.3	1.0	1.0	1.5	0.2	0.6	0.4	1.0	
Date	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value				
<b>Hydrocarbons</b>										
<b>Aromatics</b>										
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	0.524	2.205	11.035
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	0.118	0.271	0.652
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	0.108	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	0.75	2.476	11.687
<b>Aliphatics</b>										
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	70	2628	2484
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	89	2095	1929
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	282	1684	1565
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	5000	-	441	6407	5978
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	441.75	6409.476	5989.687
<b>BTEX</b>										
Benzene	mg/kg	0.01	0.001	1.5	0.01	1	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	130	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	50	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	25	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	100	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Island Area

Sample Type							Soil	Soil	Soil	Soil	Soil	Soil
Sample ID							TP18	QA9 - Duplicate of TP18	TP18	QA10 - Duplicate of TP18	HS12	QA11 - Duplicate of HS12
Depth (m)							0.25	0.25	1.00	1.00	0.20	0.20
Date							20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value						
<b>Hydrocarbons</b>												
<b>Aromatics</b>												
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	0.306	0.567	2.116	2.759	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	0.434	0.847	2.433	3.455	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	0.114	0.195	0.717	0.802	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	0.854	1.609	5.266	7.016	-	-
<b>Aliphatics</b>												
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	-	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	5000	-	-	-	-	-	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	0.854	1.609	5.266	7.016	-	-
<b>BTEX</b>												
Benzene	mg/kg	0.01	0.001	1.5	0.01	1	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	130	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	50	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	25	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	100	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Mainland Area

Sample Type								Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID								BH325	QA1 - Duplicate of BH325	BH326	BH326	QA2 - Duplicate of BH326	BH327	BH327
Depth (m)								0.5	0.5	0.5	1.0	1.00	0.5	1.0
Date								13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value								
<b>Hydrocarbons</b>														
<b>Aromatics</b>														
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	0.257	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	0.257	-	-	-	-	-	-	-
<b>Aliphatics</b>														
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	83	30	-	-	-	-	2	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	102	34	-	-	-	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	59	-	-	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	5000	244	64	-	-	-	-	2	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	244.3	64	-	-	-	-	2	-
<b>BTEX</b>														
Benzene	mg/kg	0.01	0.001	1.5	0.01	1	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	130	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	50	-	-	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	25	-	-	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	100	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Mainland Area

Sample Type	Mainland Area									
Sample ID	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (m)	BH328	QA3 - Duplicate of BH328	BH329	BH329	QA4 - Duplicate of BH329	BH330	BH330	TP11	TP11	
Date	0.5	0.5	0.5	1.0	0.5	0.5	1.0	0.3	1.0	
Parameters	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	15-Oct-08	15-Oct-08	
Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value					
<b>Hydrocarbons</b>										
<b>Aromatics</b>										
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	-	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	-	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-	-
<b>Aliphatics</b>										
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	5000	-	-	-	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	-	-	-
<b>BTEX</b>										
Benzene	mg/kg	0.01	0.001	1.5	0.01	1	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	130	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	50	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	25	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	100	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 1 : Soil Analytical Results - Hydrocarbons

Mainland Area

Sample Type	Mainland Area										
Sample ID	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth (m)	TP12	TP12	TP13	TP14	TP14	TP15	TP15	TP16	TP16	TP17	TP17
Date	0.3	1.6	0.3	0.30	1.00	0.15	2.00	0.20	1.90	0.30	1.10
	15-Oct-08	15-Oct-08	15-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value					
<b>Hydrocarbons</b>											
<b>Aromatics</b>											
C6-C7	mg/kg	0.01	0.083	650	nv	nv	-	-	-	-	-
C7-C8	mg/kg	0.01	0.104	670	nv	nv	-	-	-	-	-
C8-C10	mg/kg	0.01	0.130	230	nv	nv	-	-	-	-	-
C10-C12	mg/kg	0.01	0.205	45,000	nv	nv	-	-	-	-	-
C12-C16	mg/kg	0.1	0.408	73,000	nv	nv	-	-	-	-	-
C16-C21	mg/kg	0.1	1.29	57,000	nv	nv	-	-	-	-	-
C21-C35	mg/kg	0.1	10.2	57,000	nv	nv	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-	-	-
<b>Aliphatics</b>											
C5-C6	mg/kg	0.01	0.0742	370	nv	nv	-	-	-	-	-
C6-C8	mg/kg	0.01	0.337	740	nv	nv	-	-	-	-	-
C8-C10	mg/kg	0.01	2.58	230,000	nv	nv	-	-	-	-	-
C10-C12	mg/kg	0.01	20.4	150,000	nv	nv	-	-	-	-	-
C12-C16	mg/kg	0.1	406	180,000	nv	nv	-	-	-	-	-
C16-C21	mg/kg	0.1	51,100	IR	nv	nv	-	-	-	-	-
C21-C35	mg/kg	0.1	615,000	nv	nv	nv	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	5000	-	-	-	-	-
Total TPH	mg/kg	0.1	0.0742	nv	nv	nv	-	-	-	-	-
<b>BTEX</b>											
Benzene	mg/kg	0.01	0.001	1.5	0.01	1	-	-	-	-	-
Toluene	mg/kg	0.01	0.0130	150	0.01	130	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0366	48,000	0.03	50	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0360	320	0.1	25	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-
MTBE	mg/kg	0.01	0.01	1,780	nv	100	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 2 :** Soil Analytical Results - PAHs

220kV Switching Yard

Sample Type								Soil							
Sample ID								HS2	HS3	HS4	HS5	HS6	HS7	HS8	HS9
Depth (m)								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Date								15-Oct-08							
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value									
<b>PAHs</b>															
Naphthalene*	ug/kg	1	10.6	270,000	nv	nv	-	-	-	-	-	-	-	-	-
Acenaphthylene	ug/kg	1	457	2,100,000	nv	nv	-	-	-	-	-	-	-	-	-
Acenaphthene	ug/kg	1	21,000	34,000,000	nv	nv	-	-	-	-	-	-	-	-	-
Fluorene	ug/kg	1	27,200	69,000,000	nv	nv	-	-	-	-	-	-	-	-	-
Phenanthrene*	ug/kg	1	1,860	34,000,000	nv	nv	-	-	-	-	-	-	-	-	-
Anthracene*	ug/kg	1	23.9	520,000,000	nv	nv	-	-	-	-	-	-	-	-	-
Fluoranthene*	ug/kg	1	86.8	3,400,000	nv	nv	-	-	-	-	-	-	-	-	-
Pyrene	ug/kg	1	155,000	35,000,000	nv	nv	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene*	ug/kg	1	27.7	340,000	nv	nv	-	-	-	-	-	-	-	-	-
Chrysene*	ug/kg	1	342.4	3,500,000	nv	nv	-	-	-	-	-	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene*	ug/kg	1	82.9	35,000	nv	nv	-	-	-	-	-	-	-	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	-	-	-	-	-
Dibenzo(ah)anthracene	ug/kg	1	284	35,000	nv	nv	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	-	-	-	-	-	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	<b>40,000</b>	-	-	-	-	-	-	-	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment  
xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 2 : Soil Analytical Results - PAHs

110kV Switching Yard

Sample Type							Soil	Soil	Soil
Sample ID							HS10	HS11	QA6 - Duplicate of HS11
Depth (m)							0.1	0.1	0.1
Date							15-Oct-08	15-Oct-08	15-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
<b>PAHs</b>									
Naphthalene*	ug/kg	1	10.6	270,000	nv	nv	-	-	-
Acenaphthylene	ug/kg	1	457	2,100,000	nv	nv	-	-	-
Acenaphthene	ug/kg	1	21,000	34,000,000	nv	nv	-	-	-
Fluorene	ug/kg	1	27,200	69,000,000	nv	nv	-	-	-
Phenanthrene*	ug/kg	1	1,860	34,000,000	nv	nv	-	-	-
Anthracene*	ug/kg	1	23.9	520,000,000	nv	nv	-	-	-
Fluoranthene*	ug/kg	1	86.8	3,400,000	nv	nv	-	-	-
Pyrene	ug/kg	1	155,000	35,000,000	nv	nv	-	-	-
Benzo(a)anthracene*	ug/kg	1	27.7	340,000	nv	nv	-	-	-
Chrysene*	ug/kg	1	342.4	3,500,000	nv	nv	-	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	-	-
Benzo(a)pyrene*	ug/kg	1	82.9	35,000	nv	nv	-	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	-
Dibenzo(ah)anthracene	ug/kg	1	284	35,000	nv	nv	-	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	<b>40,000</b>	-	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	-	-

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 2 : Soil Analytical Results - PAHs

Island Area

Sample Type															
Sample ID															
Depth (m)															
Date															
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil HS1	Soil BH301	Soil BH302	Soil BH303	Soil BH304	Soil BH305	Soil BH306	Soil BH307	Soil BH308
<b>PAHs</b>															
Naphthalene*	ug/kg	1	10.6	270,000	nv	nv	-	-	2	-	-	8	4	-	-
Acenaphthylene	ug/kg	1	457	2,100,000	nv	nv	-	-	8	-	-	7	7	-	-
Acenaphthene	ug/kg	1	21,000	34,000,000	nv	nv	-	-	1	-	-	4	1	-	-
Fluorene	ug/kg	1	27,200	69,000,000	nv	nv	-	-	3	-	-	7	3	-	-
Phenanthrene*	ug/kg	1	1,860	34,000,000	nv	nv	-	-	20	-	-	37	101	-	-
Anthracene*	ug/kg	1	23.9	520,000,000	nv	nv	-	-	3	-	-	5	16	-	-
Fluoranthene*	ug/kg	1	86.8	3,400,000	nv	nv	-	-	12	-	-	10	215	-	-
Pyrene	ug/kg	1	155,000	35,000,000	nv	nv	-	-	12	-	-	10	163	-	-
Benzo(a)anthracene*	ug/kg	1	27.7	340,000	nv	nv	-	-	26	-	-	24	108	-	-
Chrysene*	ug/kg	1	342.4	3,500,000	nv	nv	-	-	18	-	-	19	194	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	-	14	-	-	11	192	-	-
Benzo(a)pyrene*	ug/kg	1	82.9	35,000	nv	nv	-	-	3	-	-	4	99	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	6	-	-	2	69	-	-
Dibenzo(ah)anthracene	ug/kg	1	284	35,000	nv	nv	-	-	2	-	-	3	14	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	8	-	-	5	93	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	40,000	-	-	112	-	-	125	1091	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	-	138	-	-	158	1279	-	-

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 2 : Soil Analytical Results - PAHs

Island Area

Sample Type											Soil								
Sample ID											BH309	BH310	BH312	BH313	BH315	BH316	BH320	BH322	BH323
Depth (m)											0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Date											13-Oct-08								
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value													
<b>PAHs</b>																			
Naphthalene*	ug/kg	1	10.6	270,000	nv	nv	-	-	-	-	19	-	-	-	-	-	-	-	-
Acenaphthylene	ug/kg	1	457	2,100,000	nv	nv	-	-	-	-	9	-	-	-	-	-	-	-	-
Acenaphthene	ug/kg	1	21,000	34,000,000	nv	nv	-	-	-	-	106	-	-	-	-	-	-	-	-
Fluorene	ug/kg	1	27,200	69,000,000	nv	nv	-	-	-	-	40	-	-	-	-	-	-	-	-
Phenanthrene*	ug/kg	1	1,860	34,000,000	nv	nv	-	-	-	-	55	-	-	-	-	-	-	-	-
Anthracene*	ug/kg	1	23.9	520,000,000	nv	nv	-	-	-	-	12	-	-	-	-	-	-	-	-
Fluoranthene*	ug/kg	1	86.8	3,400,000	nv	nv	-	-	-	-	78	-	-	-	-	-	-	-	-
Pyrene	ug/kg	1	155,000	35,000,000	nv	nv	-	-	-	-	65	-	-	-	-	-	-	-	-
Benzo(a)anthracene*	ug/kg	1	27.7	340,000	nv	nv	-	-	-	-	115	-	-	-	-	-	-	-	-
Chrysene*	ug/kg	1	342.4	3,500,000	nv	nv	-	-	-	-	51	-	-	-	-	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	61	-	-	-	-	-	-	-	-
Benzo(a)pyrene*	ug/kg	1	82.9	35,000	nv	nv	-	-	-	-	35	-	-	-	-	-	-	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	28	-	-	-	-	-	-	-	-
Dibenzo(ah)anthracene	ug/kg	1	284	35,000	nv	nv	-	-	-	-	8	-	-	-	-	-	-	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	-	-	60	-	-	-	-	-	-	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	40,000	-	-	-	-	514	-	-	-	-	-	-	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	-	-	-	739	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 2 : Soil Analytical Results - PAHs

Island Area

Sample Type											Soil								
Sample ID											BH324	BH331	BH332	BH333	TP01	TP02	TP03	TP04	TP05
Depth (m)											0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.4	0.4
Date											13-Oct-08	13-Oct-08	15-Oct-08						
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value													
<b>PAHs</b>																			
Naphthalene*	ug/kg	1	10.6	270,000	nv	nv	-	-	-	-	2	2	-	2	-				
Acenaphthylene	ug/kg	1	457	2,100,000	nv	nv	-	-	-	-	3	2	-	3	-				
Acenaphthene	ug/kg	1	21,000	34,000,000	nv	nv	-	-	-	-	21	32	-	35	-				
Fluorene	ug/kg	1	27,200	69,000,000	nv	nv	-	-	-	-	1	1	-	3	-				
Phenanthrene*	ug/kg	1	1,860	34,000,000	nv	nv	-	-	-	-	17	21	-	17	-				
Anthracene*	ug/kg	1	23.9	520,000,000	nv	nv	-	-	-	-	4	3	-	5	-				
Fluoranthene*	ug/kg	1	86.8	3,400,000	nv	nv	-	-	-	-	22	26	-	33	-				
Pyrene	ug/kg	1	155,000	35,000,000	nv	nv	-	-	-	-	27	40	-	43	-				
Benzo(a)anthracene*	ug/kg	1	27.7	340,000	nv	nv	-	-	-	-	101	79	-	42	-				
Chrysene*	ug/kg	1	342.4	3,500,000	nv	nv	-	-	-	-	19	35	-	30	-				
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	33	34	-	42	-				
Benzo(a)pyrene*	ug/kg	1	82.9	35,000	nv	nv	-	-	-	-	11	18	-	10	-				
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	10	12	-	9	-				
Dibenzo(ah)anthracene	ug/kg	1	284	35,000	nv	nv	-	-	-	-	3	2	-	2	-				
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	-	-	10	10	-	9	-				
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	40,000	-	-	-	-	229	240	-	199	-				
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	-	-	-	284	316	-	287	-				

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 2 : Soil Analytical Results - PAHs

Island Area

Sample Type							Soil	Soil	Soil	Soil	Soil	Soil
Sample ID							TP06	TP07	TP08	TP09	TP10	QA9 - Duplicate of TP18
Depth (m)							0.3	0.3	0.3	0.2	0.4	0.25
Date							15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	20-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value						
<b>PAHs</b>												
Naphthalene*	ug/kg	1	10.6	270,000	nv	nv	-	-	23	-	-	6
Acenaphthylene	ug/kg	1	457	2,100,000	nv	nv	-	-	22	-	-	15
Acenaphthene	ug/kg	1	21,000	34,000,000	nv	nv	-	-	203	-	-	19
Fluorene	ug/kg	1	27,200	69,000,000	nv	nv	-	-	61	-	-	4
Phenanthrene*	ug/kg	1	1,860	34,000,000	nv	nv	-	-	37	-	-	69
Anthracene*	ug/kg	1	23.9	520,000,000	nv	nv	-	-	10	-	-	19
Fluoranthene*	ug/kg	1	86.8	3,400,000	nv	nv	-	-	78	-	-	255
Pyrene	ug/kg	1	155,000	35,000,000	nv	nv	-	-	113	-	-	186
Benzo(a)anthracene*	ug/kg	1	27.7	340,000	nv	nv	-	-	56	-	-	445
Chrysene*	ug/kg	1	342.4	3,500,000	nv	nv	-	-	27	-	-	163
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	-	15	-	-	239
Benzo(a)pyrene*	ug/kg	1	82.9	35,000	nv	nv	-	-	33	-	-	114
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	20	-	-	62
Dibenzo(ah)anthracene	ug/kg	1	284	35,000	nv	nv	-	-	11	-	-	38
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	97	-	-	95
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	<b>40,000</b>	-	-	396	-	-	1467
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	-	806	-	-	1729

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 2 :** Soil Analytical Results - PAHs

Island Area

Sample Type							Soil	Soil	Soil	Soil
Sample ID							TP18	QA10 - Duplicate of TP18	HS12	QA11- Duplicate of HS12
Depth (m)							1	1	0.2	0.2
Date							20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value				
<b>PAHs</b>										
Naphthalene*	ug/kg	1	10.6	270,000	nv	nv	27	25	-	-
Acenaphthylene	ug/kg	1	457	2,100,000	nv	nv	52	69	-	-
Acenaphthene	ug/kg	1	21,000	34,000,000	nv	nv	20	28	-	-
Fluorene	ug/kg	1	27,200	69,000,000	nv	nv	13	17	-	-
Phenanthrene*	ug/kg	1	1,860	34,000,000	nv	nv	316	433	-	-
Anthracene*	ug/kg	1	23.9	520,000,000	nv	nv	63	93	-	-
Fluoranthene*	ug/kg	1	86.8	3,400,000	nv	nv	927	1205	-	-
Pyrene	ug/kg	1	155,000	35,000,000	nv	nv	725	914	-	-
Benzo(a)anthracene*	ug/kg	1	27.7	340,000	nv	nv	1109	1868	-	-
Chrysene*	ug/kg	1	342.4	3,500,000	nv	nv	467	503	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	857	1084	-	-
Benzo(a)pyrene*	ug/kg	1	82.9	35,000	nv	nv	412	515	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	267	309	-	-
Dibenzo(ah)anthracene	ug/kg	1	284	35,000	nv	nv	120	108	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	330	385	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	<b>40,000</b>	4775	6420	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	5705	7556	-	-

xx Exceeds Human Health Generic Assessment  
xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 2 : Soil Analytical Results - PAHs

Mainland Area

Sample Type								Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID								BH325	QA1 - Duplicate of BH325	BH326	BH327	BH328	QA3 - Duplicate of BH328	BH329
Depth (m)								0.5	0.5	0.5	0.5	0.5	0.5	0.5
Date								13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value								
<b>PAHs</b>														
Naphthalene*	ug/kg	1	10.6	270,000	nv	nv	2	-	-	-	-	-	-	-
Acenaphthylene	ug/kg	1	457	2,100,000	nv	nv	34	-	-	-	-	-	-	-
Acenaphthene	ug/kg	1	21,000	34,000,000	nv	nv	166	-	-	-	-	-	-	-
Fluorene	ug/kg	1	27,200	69,000,000	nv	nv	24	-	-	-	-	-	-	-
Phenanthrene*	ug/kg	1	1,860	34,000,000	nv	nv	6	-	-	-	-	-	-	-
Anthracene*	ug/kg	1	23.9	520,000,000	nv	nv	4	-	-	-	-	-	-	-
Fluoranthene*	ug/kg	1	86.8	3,400,000	nv	nv	9	-	-	-	-	-	-	-
Pyrene	ug/kg	1	155,000	35,000,000	nv	nv	15	-	-	-	-	-	-	-
Benzo(a)anthracene*	ug/kg	1	27.7	340,000	nv	nv	17	-	-	-	-	-	-	-
Chrysene*	ug/kg	1	342.4	3,500,000	nv	nv	12	-	-	-	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	6	-	-	-	-	-	-	-
Benzo(a)pyrene*	ug/kg	1	82.9	35,000	nv	nv	-	-	-	-	-	-	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	-	-	-	-
Dibenzo(ah)anthracene	ug/kg	1	284	35,000	nv	nv	-	-	-	-	-	-	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	-	-	-	-	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	<b>40,000</b>	56	-	-	-	-	-	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	294	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 2 :** Soil Analytical Results - PAHs

Mainland Area

Sample Type	Mainland Area													
Sample ID	Soil													
Depth (m)	QA4 - Duplicate of BH329													
Date	0.5													
	13-Oct-08													
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil							
<b>PAHs</b>														
Naphthalene*	ug/kg	1	10.6	270,000	nv	nv	-	-	-	-	-	-	-	-
Acenaphthylene	ug/kg	1	457	2,100,000	nv	nv	-	-	-	-	-	-	-	-
Acenaphthene	ug/kg	1	21,000	34,000,000	nv	nv	-	-	-	-	-	-	-	-
Fluorene	ug/kg	1	27,200	69,000,000	nv	nv	-	-	-	-	-	-	-	-
Phenanthrene*	ug/kg	1	1,860	34,000,000	nv	nv	-	-	-	-	-	-	-	-
Anthracene*	ug/kg	1	23.9	520,000,000	nv	nv	-	-	-	-	-	-	-	-
Fluoranthene*	ug/kg	1	86.8	3,400,000	nv	nv	-	-	-	-	-	-	-	-
Pyrene	ug/kg	1	155,000	35,000,000	nv	nv	-	-	-	-	-	-	-	-
Benzo(a)anthracene*	ug/kg	1	27.7	340,000	nv	nv	-	-	-	-	-	-	-	-
Chrysene*	ug/kg	1	342.4	3,500,000	nv	nv	-	-	-	-	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	-	-	-	-
Benzo(a)pyrene*	ug/kg	1	82.9	35,000	nv	nv	-	-	-	-	-	-	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	-	-	-	-
Dibenzo(ah)anthracene	ug/kg	1	284	35,000	nv	nv	-	-	-	-	-	-	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	-	-	-	-	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	<b>40,000</b>	-	-	-	-	-	-	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment  
xx Exceeds Controlled Waters Generic Assessment  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 3 :** Soil Analytical Results - PCBs

220kV Switching Yard

Sample Type														
Sample ID														
Depth (m)														
Date														
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil HS2	Soil HS3	Soil HS4	Soil HS5	Soil HS6	Soil HS7	Soil HS8	Soil HS9
<b>PCBs</b>														
PCB Congener 28	mg/kg	0.001	0.033	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	0.041	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	0.275	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	1.81	6.82	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	0.6	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	0.416	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	0.791	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Total of 7 Congeners	mg/kg	0.001	0.003	16.8	0.02	1	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic  
xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 3 :** Soil Analytical Results - PCBs

110kV Switching Yard
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Sample Type	Soil			Soil			Soil		
Sample ID	HS10	HS11	QA6 - Duplicate of HS11						
Depth (m)	0.1	0.1	0.1						
Date	15-Oct-08	15-Oct-08	15-Oct-08						
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
PCBs									
PCB Congener 28	mg/kg	0.001	0.033	16.8	nv	nv	-	-	-
PCB Congener 52	mg/kg	0.001	0.041	16.8	nv	nv	-	-	-
PCB Congener 101	mg/kg	0.001	0.275	16.8	nv	nv	-	-	-
PCB Congener 118	mg/kg	0.001	1.81	6.82	nv	nv	-	-	-
PCB Congener 153	mg/kg	0.001	0.6	16.8	nv	nv	-	-	-
PCB Congener 138	mg/kg	0.001	0.416	16.8	nv	nv	-	-	-
PCB Congener 180	mg/kg	0.001	0.791	16.8	nv	nv	-	-	-
PCB Total of 7 Congeners	mg/kg	0.001	0.003	16.8	0.02	1	-	-	-

xx	Exceeds Human Health Generic
xx	Exceeds Controlled Waters Generic
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 3 :** Soil Analytical Results - PCBs

Island Area

Sample Type														
Sample ID														
Depth (m)														
Date														
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
PCBs							HS1	BH303	BH307	BH309	BH312	BH313	BH315	BH316
PCB Congener 28	mg/kg	0.001	0.033	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	0.041	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	0.275	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	1.81	6.82	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	0.6	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	0.416	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	0.791	16.8	nv	nv	-	-	-	-	-	-	-	-
PCB Total of 7 Congeners	mg/kg	0.001	0.003	16.8	0.02	1	-	-	-	-	-	-	-	-

xx	Exceeds Human Health Generic
xx	Exceeds Controlled Waters Generic
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 3 :** Soil Analytical Results - PCBs

Island Area

Sample Type													
Sample ID													
Depth (m)													
Date													
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil	
<b>PCBs</b>													
PCB Congener 28	mg/kg	0.001	0.033	16.8	nv	nv	-	-	-	-	-	-	
PCB Congener 52	mg/kg	0.001	0.041	16.8	nv	nv	-	-	-	-	-	-	
PCB Congener 101	mg/kg	0.001	0.275	16.8	nv	nv	-	-	-	-	-	-	
PCB Congener 118	mg/kg	0.001	1.81	6.82	nv	nv	-	-	-	-	-	-	
PCB Congener 153	mg/kg	0.001	0.6	16.8	nv	nv	-	-	-	-	-	-	
PCB Congener 138	mg/kg	0.001	0.416	16.8	nv	nv	-	-	-	-	-	-	
PCB Congener 180	mg/kg	0.001	0.791	16.8	nv	nv	-	-	-	-	-	-	
PCB Total of 7 Congeners	mg/kg	0.001	0.003	16.8	0.02	1	-	-	-	-	-	-	

xx	Exceeds Human Health Generic
xx	Exceeds Controlled Waters Generic
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 3 :** Soil Analytical Results - PCBs

Island Area

Sample Type												
Sample ID												
Depth (m)												
Date												
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil TP02	Soil TP07	Soil QA8 - Duplicate of TP08	Soil TP08	Soil TP09	Soil TP10
<b>PCBs</b>												
PCB Congener 28	mg/kg	0.001	0.033	16.8	nv	nv	-	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	0.041	16.8	nv	nv	-	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	0.275	16.8	nv	nv	-	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	1.81	6.82	nv	nv	-	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	0.6	16.8	nv	nv	-	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	0.416	16.8	nv	nv	-	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	0.791	16.8	nv	nv	-	-	-	-	-	-
PCB Total of 7 Congeners	mg/kg	0.001	0.003	16.8	0.02	1	-	-	-	-	-	-

xx	Exceeds Human Health Generic
xx	Exceeds Controlled Waters Generic
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 3 :** Soil Analytical Results - PCBs

Mainland Area

Sample Type					Soil	Soil	Soil	Soil
Sample ID					BH326	QA2 - Duplicate of BH326	BH327	BH329
Depth (m)					1.0	1.00	0.5	1.0
Date					13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value		
<b>PCBs</b>								
PCB Congener 28	mg/kg	0.001	0.033	16.8	nv	nv	-	-
PCB Congener 52	mg/kg	0.001	0.041	16.8	nv	nv	-	-
PCB Congener 101	mg/kg	0.001	0.275	16.8	nv	nv	-	-
PCB Congener 118	mg/kg	0.001	1.81	6.82	nv	nv	-	-
PCB Congener 153	mg/kg	0.001	0.6	16.8	nv	nv	-	-
PCB Congener 138	mg/kg	0.001	0.416	16.8	nv	nv	-	-
PCB Congener 180	mg/kg	0.001	0.791	16.8	nv	nv	-	-
PCB Total of 7 Congeners	mg/kg	0.001	0.003	16.8	0.02	1	-	-

xx	Exceeds Human Health Generic
xx	Exceeds Controlled Waters Generic
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 3 :** Soil Analytical Results - PCBs

Mainland Area

Sample Type											
Sample ID											
Depth (m)											
Date											
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil
							BH330	TP11	TP12	TP14	TP16
							0.5	1.0	0.3	0.30	1.90
							13-Oct-08	15-Oct-08	15-Oct-08	20-Oct-08	20-Oct-08
<b>PCBs</b>											
PCB Congener 28	mg/kg	0.001	0.033	16.8	nv	nv	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	0.041	16.8	nv	nv	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	0.275	16.8	nv	nv	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	1.81	6.82	nv	nv	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	0.6	16.8	nv	nv	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	0.416	16.8	nv	nv	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	0.791	16.8	nv	nv	-	-	-	-	-
PCB Total of 7 Congeners	mg/kg	0.001	0.003	16.8	0.02	1	-	-	-	-	-

xx Exceeds Human Health Generic  
xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 4 : Soil Analytical Results - Heavy Metals

220kV Switching Yard

Sample Type															
Sample ID															
Depth (m)															
Date															
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil HS2	Soil HS3	Soil HS4	Soil HS5	Soil HS6	Soil HS7	Soil HS8	Soil HS9
<b>Heavy Metals</b>															
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	-	-	-	-	-	-	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	55	3	-	-	-	-	-	-	-
Barium	mg/kg	6	4.11	28,000	454.5	160	625	14	-	-	11	15	-	-	-
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	0.3	0.2	0.4	-	0.4	0.3	0.2	0.2
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	9.9	-	-	11	13	-	-	-
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	9.1	2.3	3.4	5.4	7.5	0.6	1.2	1.4
Copper	mg/kg	6	0.035	IR	45.9	36	190	19	-	15	-	19	-	-	-
Lead	mg/kg	2	0.399	750	61.9	85	530	21	4	9	4	12	-	-	3
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	0.5	0.5	-	-	0.4	0.4	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	-	-	0.9	-	-	-	-	-
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	65	12	33	19	31	7	11	6.9
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	110	16	59	17	45	10	16	7.5
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	240	40	170	37	150	23	28	18

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx `
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 4 :** Soil Analytical Results - Heavy Metals

110 Switching Yard
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Sample Type			Soil	Soil	Soil					
Sample ID			HS10	HS11	QA6 - Duplicate of HS11					
Depth (m)			0.1	0.1	0.1					
Date			15-Oct-08	15-Oct-08	15-Oct-08					
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
<b>Heavy Metals</b>										
Antimony	mg/kg	1.5	0.226	15	1.54	3	<b>15</b>	-	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	<b>55</b>	3	-	-
Barium	mg/kg	6	4.11	28,000	454.5	160	<b>625</b>	28	-	-
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	<b>12</b>	0.3	-	0.4
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	<b>380</b>	15	-	4.5
Cobalt	mg/kg	0.4	33	3,000	15.1	9	<b>240</b>	9.3	1.3	3.6
Copper	mg/kg	6	0.035	IR	45.9	36	<b>190</b>	18	-	9
Lead	mg/kg	2	0.399	750	61.9	85	<b>530</b>	10	3	5
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	<b>10</b>	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	<b>200</b>	-	-	-
Nickel	mg/kg	0.9	1.91	5,000	50	35	<b>210</b>	43	11	28
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	<b>100</b>	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	<b>250</b>	57	17	43
Zinc	mg/kg	2.5	0.289	IR	144.7	140	<b>720</b>	96	50	80

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 4 :** Soil Analytical Results - Heavy Metals

Island Area

Sample Type	Island Area															
Sample ID																
Depth (m)																
Date																
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil								
Heavy Metals																
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	2.1	-	-	2.9	-	3.1	2.8	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	55	5	7	7	-	4	4	4	9	9
Barium	mg/kg	6	4.11	28,000	454.5	160	625	68	41	50	34	36	36	31	47	44
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	0.3	-	-	-	-	0.2	-	-	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	26	36	34	26	34	27	23	32	28
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	13	20	21	17	19	16	13	15	13
Copper	mg/kg	6	0.035	IR	45.9	36	190	26	34	36	31	36	40	41	50	24
Lead	mg/kg	2	0.399	750	61.9	85	530	29	16	22	15	20	11	320	72	71
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	1.8	1	1	-	-	-	1.5	1	2
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	53	48	43	48	45	47	40	36	28
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	130	58	55	19	55	21	36	65	42
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	240	83	96	260	86	92	310	91	75

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 4 :** Soil Analytical Results - Heavy Metals

Island Area

Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil							
Sample ID	BH307	BH308	BH309	BH309	BH310	BH310	BH312	BH313	BH313							
Depth (m)	0.5	0.50	0.5	2.0	0.5	1.2	0.5	0.5	2.5							
Date	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08							
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value									
<b>Heavy Metals</b>																
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	2.2	-	-	4.2	2.5	3.2	-	3.2	3.2
Arsenic	mg/kg	3	0.294	500	21.9	29	55	4	8	14	8	5	5	13	4	7
Barium	mg/kg	6	4.11	28,000	454.5	160	625	21	22	36	50	26	37	39	59	33
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	0.3	-	-	-	0.4	-	-	-	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	20	6	34	36	21	30	34	24	31
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	11	4	20	13	12	15	24	19	15
Copper	mg/kg	6	0.035	IR	45.9	36	190	19	13	26	22	22	28	37	160	27
Lead	mg/kg	2	0.399	750	61.9	85	530	12	7	24	200	16	20	52	57	12
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	-	1	1	-	-	-	-	2.4	1
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	28	11	39	34	33	41	47	96	40
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	24	57	51	20	16	22	51	19	22
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	59	31	77	86	69	73	106	690	69

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 4 : Soil Analytical Results - Heavy Metals

Island Area

Sample Type	Island Area																
Sample ID																	
Depth (m)																	
Date																	
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil									
Heavy Metals																	
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	-	3.9	-	-	-	-	-	-	2.2	3
Arsenic	mg/kg	3	0.294	500	21.9	29	55	-	8	-	14	9	10	6	5	9	9
Barium	mg/kg	6	4.11	28,000	454.5	160	625	10	40	31	56	39	19	41	33	41	41
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	0.6	-	-	-	-	-	2	-	-	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	8.2	31	17	34	34	23	24	27	31	31
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	5.1	21	9.1	24	18	7	14	14	16	16
Copper	mg/kg	6	0.035	IR	45.9	36	190	31	32	13	36	34	6	44	19	27	27
Lead	mg/kg	2	0.399	750	61.9	85	530	18	9	7	13	16	11	24	11	5	5
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	0.6	0.7	0.6	-	1	2	1	-	-	-
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	17	49	24	56	38	10	35	35	42	42
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	11	22	15	51	51	55	49	18	20	20
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	160	59	47	77	74	39	135	57	55	55

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 4 :** Soil Analytical Results - Heavy Metals

Island Area

Sample Type	Island Area															
Sample ID																
Depth (m)																
Date																
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil BH323	Soil BH324	Soil BH324	Soil BH331	Soil BH331	Soil BH332	Soil BH332	Soil BH333	Soil BH333
<b>Heavy Metals</b>																
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	-	3.5	1.8	-	3.1	2.1	2.9	-	2.9
Arsenic	mg/kg	3	0.294	500	21.9	29	55	6	-	3	5	8	5	12	13	6
Barium	mg/kg	6	4.11	28,000	454.5	160	625	24	56	36	33	33	34	35	66	30
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	-	-	-	0.9	-	0.3	-	2	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	13	32	22	6.7	29	20	31	23	27
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	5	19	10	6	15	11	17	13	12
Copper	mg/kg	6	0.035	IR	45.9	36	190	9	34	17	9	25	20	27	48	20
Lead	mg/kg	2	0.399	750	61.9	85	530	34	20	25	6	10	13	9	54	22
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	1	-	2.4	-	-	-	-	3	-
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	4	49	20	16	41	54	44	57	30
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	25	23	21	7.3	20	250	24	109	22
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	22	100	130	42	60	85	55	380	75

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 4 : Soil Analytical Results - Heavy Metals

Island Area

Sample Type	Soil															
Sample ID	QA7 - Duplicate of BH333	TP01	TP02	TP02	TP03	TP04	TP05	TP06	TP06							
Depth (m)	2.0	0.4	0.3	1.0	0.3	0.4	0.4	0.3	0.6							
Date	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08							
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value									
<b>Heavy Metals</b>																
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	2.5	2.9	3.4	3.4	-	2.3	2.9	3.8	2.2
Arsenic	mg/kg	3	0.294	500	21.9	29	55	4	4	7	4	6	5	6	5	-
Barium	mg/kg	6	4.11	28,000	454.5	160	625	43	55	56	43	40	36	39	13	40
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	-	-	-	-	-	0.3	0.3	2.9	0.3
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	25	28	27	27	28	21	28	-	25
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	10	13	11	9.1	16	10	17	4.3	14
Copper	mg/kg	6	0.035	IR	45.9	36	190	17	21	19	13	30	28	31	12	27
Lead	mg/kg	2	0.399	750	61.9	85	530	17	37	36	16	36	15	11	14	12
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	0.8	-	-	-	1	0.7	-	-	-
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	25	33	32	18	33	44	44	18	39
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	24	30	29	30	46	110	21	9	19
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	61	83	81	68	94	140	77	110	80

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 4 :** Soil Analytical Results - Heavy Metals

Island Area

Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil								
Sample ID	TP07	TP08	TP08	QA8 - Duplicate of TP08	TP08	TP09	TP09	TP10							
Depth (m)	0.3	0.3	1.0	1.0	1.5	0.2	0.6	0.4							
Date	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08							
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value								
<b>Heavy Metals</b>															
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	-	3.3	-	2.8	2.6	2.9	3.4	3.3
Arsenic	mg/kg	3	0.294	500	21.9	29	55	3	3	24	6	5	7	4	7
Barium	mg/kg	6	4.11	28,000	454.5	160	625	-	71	34	65	18	56	53	31
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	1	-	-	-	-	0.3	-	0.3
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	-	32	31	31	24	31	31	22
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	2.9	17	1	13	11	20	17	9.4
Copper	mg/kg	6	0.035	IR	45.9	36	190	7	30	35	27	11	37	32	25
Lead	mg/kg	2	0.399	750	61.9	85	530	7	9	78	45	8	20	15	48
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	-	-	-	0.7	-	-	-	1.2
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	13	43	31	41	29	51	47	39
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	10	25	247	27	86	34	24	70
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	51	79	60	82	60	110	99	340

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 4 :** Soil Analytical Results - Heavy Metals

Island Area

Sample Type								Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID								TP10	TP18	QA9 - Duplicate of TP18	TP18	QA10 - Duplicate of TP18	HS12	QA11 - Duplicate of HS12
Depth (m)								1.0	0.25	0.25	1.00	1.00	0.20	0.20
Date								15-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value							
<b>Heavy Metals</b>														
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	-	-	-	-	-	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	55	11	13	10	11	15	2	2
Barium	mg/kg	6	4.11	28,000	454.5	160	625	22	144	74	126	173	67	67
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	-	-	-	-	-	-	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	30	23	23	19	27	31	31
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	11	17	14	9	13	15	17
Copper	mg/kg	6	0.035	IR	45.9	36	190	16	44	35	59	71	33	38
Lead	mg/kg	2	0.399	750	61.9	85	530	42	152	97	295	422	28	31
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	1	1	2	1	2	2	2
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	38	-	31	21	29	143	207
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	85	67	61	47	65	633	934
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	87	115	93	118	161	257	215

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 4 :** Soil Analytical Results - Heavy Metals

Mainland Area

Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sample ID	BH325	QA1 - Duplicate of BH325	BH326	BH326	QA2 - Duplicate of BH326	BH327	BH327	BH328
Depth (m)	0.5	0.5	0.5	1.0	1.00	0.5	1.0	0.5
Date	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	
<b>Heavy Metals</b>								
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	6.1 1.7 2.9 3.4 - 2.9 3.3 3.3
Arsenic	mg/kg	3	0.294	500	21.9	29	55	- - 7 6 14 7 9 6
Barium	mg/kg	6	4.11	28,000	454.5	160	625	120 18 35 37 31 40 37 40
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	1.7 0.2 0.3 - - -
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	25 15 27 29 37 31 29 31
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	19 6.8 16 13 16 14 16 15
Copper	mg/kg	6	0.035	IR	45.9	36	190	51 15 28 20 20 26 24 31
Lead	mg/kg	2	0.399	750	61.9	85	530	34 9 15 19 19 13 12 16
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	- - - - - - -
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	1.8 - - - 1 - - -
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	57 23 43 35 31 39 40 43
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	- - - - - - -
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	22 12 19 25 52 20 22 20
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	390 87 89 87 78 68 74 76

xx Exceeds Human Health Generic  
 xx Exceeds Controlled Waters Generic  
 xx  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 4 :** Soil Analytical Results - Heavy Metals

Mainland Area

Sample Type	Soil															
Sample ID	QA3 - Duplicate of BH328	BH329	QA4 - Duplicate of BH329	BH329	BH330	BH330	TP11	TP11	TP12							
Depth (m)	0.5	0.5	0.5	1.0	0.5	1.0	0.3	1.0	0.3							
Date	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	13-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08							
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value									
<b>Heavy Metals</b>																
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	2.8	3.3	-	2.7	2.9	-	3.9	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	55	9	15	17	6	17	9	11	-	4
Barium	mg/kg	6	4.11	28,000	454.5	160	625	36	34	44	21	29	25	28	-	13
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	0.3	0.2	-	-	-	-	0.4	0.3	0.5
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	28	27	33	25	25	25	17	-	10
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	16	13	21	10	12	5	11	2.3	5.6
Copper	mg/kg	6	0.035	IR	45.9	36	190	29	23	38	13	19	8	41	7	12
Lead	mg/kg	2	0.399	750	61.9	85	530	21	15	23	15	13	18	15	3	7
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	-	-	1	-	-	2	0.9	0.8	-
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	43	37	38	30	35	3	27	6.6	17
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	19	19	48	17	20	41	16	3.8	13
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	85	81	94	70	63	29	170	39	50

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx `
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 4 : Soil Analytical Results - Heavy Metals

Mainland Area

Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil							
Sample ID	TP12	TP13	TP14	TP14	TP15	TP15	TP16	TP16	TP17	TP17							
Depth (m)	1.6	0.3	0.30	1.00	0.15	2.00	0.20	1.90	0.30	1.10							
Date	15-Oct-08	15-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08							
Parameters	Units	MDL	Controlled Water GAC Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value										
<b>Heavy Metals</b>																	
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	3.3	6	-	-	-	-	-	-	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	55	8	23	31	10	7	13	12	2	3	2
Barium	mg/kg	6	4.11	28,000	454.5	160	625	30	354	27	34	255	52	39	38	47	26
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	-	1	-	-	-	-	-	-	-	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	31	51	29	35	44	32	36	32	21	27
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	17	42	20	12	19	14	21	16	9	13
Copper	mg/kg	6	0.035	IR	45.9	36	190	25	1007	28	11	57	15	30	25	5	21
Lead	mg/kg	2	0.399	750	61.9	85	530	5	401	19	28	313	17	19	17	12	10
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	-	26	1	1	6	1	1	-	1	1
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	41	135	39	-	442	25	-	40	4	-
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	20	78	46	78	1735	63	53	48	41	41
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	58	6318	85	78	226	60	73	77	41	67

- xx Exceeds Human Health Generic
- xx Exceeds Controlled Waters Generic
- xx
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified potential

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

220kV Switching Yard

Sample Type	Soil													
Sample ID	HS2 HS3 HS4 HS5 HS6 HS7 HS8 HS9													
Depth (m)	0.1													
Date	15-Oct-08													
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value								
<b>TOC</b>														
Total Organic Carbon	%	0.2	nv	nv	nv	nv	2.1	1.3	1.0	0.4	0.9	-	-	-
<b>Miscellaneous</b>														
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	na	0.05	na	0.07	na	0.02	na	0.03
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	na	-	na	-	na	-	na	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	na	17	na	na	51	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	na	<b>1.0</b>	na	na	<b>0.5</b>	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	na	na	-	na	na	-	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na	na	na	na

**xx** Exceeds Human Health Generic  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

110kV Switching Yard
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Sample Type			Soil	Soil	Soil				
Sample ID			HS10	HS11	QA6 - Duplicate of HS11				
Depth (m)			0.1	0.1	0.1				
Date			15-Oct-08	15-Oct-08	15-Oct-08				
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
<b>TOC</b>									
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.7	0.7	1.0
<b>Miscellaneous</b>									
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	na	0.24	0.03
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	na	-	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	45	14
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	0.8	0.5
Sulphate	g/l	0.003	nv	nv	nv	nv	na	0.014	-
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	- *	- *
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	- *	- *

xx	Exceeds Human Health Generic
xx	Exceeds Controlled Waters Generic
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value
*	All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Island Area

Sample Type	Island Area														
Sample ID															
Depth (m)															
Date															
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil HS1	Soil BH301	Soil BH302	Soil BH302	Soil BH303	Soil BH304	Soil BH305	Soil BH306	Soil BH306
<b>TOC</b>															
Total Organic Carbon	%	0.2	nv	nv	nv	nv	4.50	0.5	0.3	0.2	0.5	0.4	0.9	1.6	1.1
<b>Miscellaneous</b>															
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.19	0.04	0.03	na	0.02	0.01	0.02	0.04	na
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	-	-	-	na	-	-	-	-	na
Chloride	mg/kg	5.00	nv	nv	nv	nv	116	na	na	na	6	na	na	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	-	na	na	na	<b>3.4</b>	na	na	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	0.005	na	na	na	0.04	na	na	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na	na	na	na	na

**xx** Exceeds Human Health Generic  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Island Area

Sample Type															
Sample ID															
Depth (m)															
Date															
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
<b>TOC</b>															
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.6	0.2	0.5	1.5	0.7	0.7	0.4	0.6	na
<b>Miscellaneous</b>															
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.02	0.04	0.02	na	0.02	na	0.02	0.02	na
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	-	-	-	na	-	na	-	-	na
Chloride	mg/kg	5.00	nv	nv	nv	nv	1120	na	na	1225	na	na	22	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	<b>4.1</b>	na	na	-	na	na	<b>7.3</b>	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	0.048	na	na	0.274	na	na	0.028	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	- *	na	na	- *	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	- *	na	na	- *	na

**xx** Exceeds Human Health Generic  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Island Area

Sample Type																	
Sample ID																	
Depth (m)																	
Date																	
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
<b>TOC</b>																	
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.3	2	0.5	-	0.6	na	0.4	1.1	0.7		
<b>Miscellaneous</b>																	
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	na	0.03	na	0.03	na	na	0.04	-	0.03		
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	na	-	na	-	na	na	-	-	-		
Chloride	mg/kg	5.00	nv	nv	nv	nv	186	47	na	na	18	na	na	5511	-		
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	-	<b>2.4</b>	na	na	<b>4.1</b>	na	na	<b>2.8</b>	-		
Sulphate	g/l	0.003	nv	nv	nv	nv	0.063	0.19	na	na	0.017	na	na	0.412	0.014		
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	- *	na	na	na	na	na	na	na		
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	- *	na	na	na	na	na	na	na		

**xx** Exceeds Human Health Generic  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Island Area

Sample Type															
Sample ID															
Depth (m)															
Date															
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
<b>TOC</b>															
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.6	0.6	11.5	0.4	14.4	0.4	0.6	1.6	0.7
<b>Miscellaneous</b>															
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	na	0.03	na	0.03	na	0.02	na	0.03	na
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	na	-	na	-	na	-	na	-	na
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	35	na	na	51	na	552	na	12
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	-	na	na	<b>1.8</b>	na	-	na	<b>1.1</b>
Sulphate	g/l	0.003	nv	nv	nv	nv	na	0.012	na	na	0.321	na	-	na	0.044
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na	na	na	na	na

xx Exceeds Human Health Generic  
xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Island Area

Sample Type															
Sample ID															
Depth (m)															
Date															
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
<b>TOC</b>															
Total Organic Carbon	%	0.2	nv	nv	nv	nv	1.7	1.3	0.9	1.8	1	0.8	0.5	0.7	0.7
<b>Miscellaneous</b>															
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.02	na	na	0.03	0.01	na	0.01	0.01	0.03
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	-	na	na	-	-	na	-	-	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	18	na	na	na	na	139	na	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	1.3	na	na	na	na	-	na	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	0.006	na	na	na	na	0.05	na	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	- *	na							
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	- *	na							

**xx** Exceeds Human Health Generic  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Island Area

Sample Type	Soil											
Sample ID	TP06 TP06 TP07 TP08 TP08 QA8 - Duplicate of TP08											
Depth (m)	0.3 0.6 0.3 0.3 1.0 1.0											
Date	15-Oct-08 15-Oct-08 15-Oct-08 15-Oct-08 15-Oct-08 15-Oct-08											
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value						
<b>TOC</b>												
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.5	0.5	0.3	1.3	3.2	1.7
<b>Miscellaneous</b>												
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.02	na	0.01	0.02	na	na
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	-	na	-	-	na	na
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	na	125	na	na	57
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	na	1.7	na	na	4
Sulphate	g/l	0.003	nv	nv	nv	nv	na	na	0.004	na	na	0.011
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na	na

**xx** Exceeds Human Health Generic  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Island Area

Sample Type											
Sample ID											
Depth (m)											
Date											
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil TP08	Soil TP09	Soil TP09	Soil TP10	Soil TP10
<b>TOC</b>											
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.4	1.1	0.5	3.2	0.8
<b>Miscellaneous</b>											
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	na	-	na	0.02	na
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	na	-	na	-	na
Chloride	mg/kg	5.00	nv	nv	nv	nv	23	na	23	na	54
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	-	na	4.1	na	1.1
Sulphate	g/l	0.003	nv	nv	nv	nv	-	na	0.017	na	0.009
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na

xx Exceeds Human Health Generic  
xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Mainland area

Sample Type														
Sample ID														
Depth (m)														
Date														
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
<b>TOC</b>														
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.4	0.2	0.4	0.8	0.7	0.4	0.3	0.2
<b>Miscellaneous</b>														
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.02	0.02	0.05	na	na	0.02	na	0.04
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	-	-	-	na	na	-	na	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	na	na	95	126	34	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	na	na	-	-	<b>0.6</b>	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	na	na	na	-	0.006	0.005	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	- *	na	na	na	na	na

**xx** Exceeds Human Health Generic  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Mainland area

Sample Type														
Sample ID														
Depth (m)														
Date														
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
<b>TOC</b>														
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.3	0.8	0.5	1.1	0.3	1.6	1.1	1
<b>Miscellaneous</b>														
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.04	0.02	0.02	na	0.02	na	0.02	na
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	-	-	-	na	-	na	-	na
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	na	na	143	-	na	na	103
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	na	na	-	-	na	na	-
Sulphate	g/l	0.003	nv	nv	nv	nv	na	na	na	-	0.039	na	na	-
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	- *	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	- *	na	na	na	na	na

xx Exceeds Human Health Generic  
xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Mainland area

Sample Type													
Sample ID													
Depth (m)													
Date													
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil	
TOC													
Total Organic Carbon	%	0.2	nv	nv	nv	nv	1.4	0.8	1.6	1.4	1.1	1.2	1.4
<b>Miscellaneous</b>													
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.02	na	0.04	0.03	na	na	0.05
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	-	na	-	-	na	na	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	287	na	na	31	na	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	-	na	na	<b>1.9</b>	na	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	0.012	na	na	0.021	na	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na	na	na

xx Exceeds Human Health Generic  
xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Mainland area

Sample Type	Mainland area											
Sample ID												
Depth (m)												
Date												
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil	Soil	Soil
<b>TOC</b>												
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.6	0.5	0.7	0.3	2	1.7
<b>Miscellaneous</b>												
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	na	0.03	0.11	na	na	0.02
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	na	-	-	na	na	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	11	na	na	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	0.6	na	na	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	na	-	na	na	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na	na

**xx** Exceeds Human Health Generic  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 5 :** Soil Analytical Results - Miscellaneous

Mainland area

Sample Type										
Sample ID										
Depth (m)										
Date										
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil	Soil	Soil	Soil
<b>TOC</b>										
Total Organic Carbon	%	0.2	nv	nv	nv	nv	11.3	8.6	2.4	2.1
<b>Miscellaneous</b>										
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.04	0.02	0.06	0.02
Total Cyanide	mg/kg	2.50	50	nv	1	<b>20</b>	-	-	-	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	na	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	na	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	na	na	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na

xx	Exceeds Human Health Generic
xx	Exceeds Controlled Waters Generic
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value
*	All individual SVOCs and VOCs were less than detection limit. No TICs

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 6: Relative Percentage Difference - Soil

Sample Type	Sample ID	Depth (m)	Date	Soil		%RPDs	Soil		%RPDs
				BH325	QA1 - Duplicate of BH325		BH326	QA2 - Duplicate of BH326	
				0.5	0.5		1.0	1.00	
				13-Oct-08	13-Oct-08		13-Oct-08	13-Oct-08	
Parameters	Units	MDL							
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	mg/kg	0.01	-	-	NC	-	-	-	NC
C7-C8	mg/kg	0.01	-	-	NC	-	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC	-	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC	-	-	-	NC
C12-C16	mg/kg	0.1	0.257	-	NC	-	-	-	NC
C16-C21	mg/kg	0.1	-	-	NC	-	-	-	NC
C21-C35	mg/kg	0.1	-	-	NC	-	-	-	NC
Total Aromatics	mg/kg	0.1	0.257	-	NC	-	-	-	NC
<b>Aliphatics</b>									
C5-C6	mg/kg	0.01	-	-	NC	-	-	-	NC
C6-C8	mg/kg	0.01	-	-	NC	-	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC	-	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC	-	-	-	NC
C12-C16	mg/kg	0.1	83	30	<b>93.81</b>	-	-	-	NC
C16-C21	mg/kg	0.1	102	34	<b>100.00</b>	-	-	-	NC
C21-C35	mg/kg	0.1	59	-	NC	-	-	-	NC
Total Aliphatics (MO)	mg/kg	0.1	244	64	<b>116.88</b>	-	-	-	NC
Total TPH	mg/kg	0.1	244.257	64	<b>116.95</b>	-	-	-	NC
<b>BTEX</b>									
Benzene	mg/kg	0.01	-	-	NC	-	-	-	NC
Toluene	mg/kg	0.01	-	-	NC	-	-	-	NC
Ethylbenzene	mg/kg	0.01	-	-	NC	-	-	-	NC
Total Xylene	mg/kg	0.01	-	-	NC	-	-	-	NC
BTEX	mg/kg	nv	-	-	NC	-	-	-	NC
MTBE	mg/kg	0.01	-	-	NC	-	-	-	NC
<b>TOC</b>									
Total Organic Carbon	%	0.2	0.4	0.2	66.67	0.8	0.7		13.33
<b>PAHs</b>									
Naphthalene	ug/kg	1	2	-	NC	na	na		NC
Acenaphthylene	ug/kg	1	34	-	NC	na	na		NC
Acenaphthene	ug/kg	1	166	-	NC	na	na		NC
Fluorene	ug/kg	1	24	-	NC	na	na		NC
Phenanthrene	ug/kg	1	6	-	NC	na	na		NC
Anthracene	ug/kg	1	4	-	NC	na	na		NC
Fluoranthene	ug/kg	1	9	-	NC	na	na		NC
Pyrene	ug/kg	1	15	-	NC	na	na		NC
Benzo(a)anthracene	ug/kg	1	17	-	NC	na	na		NC
Chrysene	ug/kg	1	12	-	NC	na	na		NC
Benzo(b)+Benzo(k)fluoranthene	ug/kg	1	6	-	NC	na	na		NC
Benzo(a)pyrene	ug/kg	1	-	-	NC	na	na		NC
Indeno(123cd)pyrene	ug/kg	1	-	-	NC	na	na		NC
Dibenzo(ah)anthracene	ug/kg	1	-	-	NC	na	na		NC
Benzo(ghi)perylene	ug/kg	1	-	-	NC	na	na		NC
Total 16 EPA PAHs (16)	ug/kg	nv	294	-	NC	na	na		NC
<b>PCBs</b>									
PCB Total of 7 Congeners	ug/kg	1	na	na	NC	-	-		NC
<b>Heavy Metals</b>									
Antimony	mg/kg	1.5	6	2	113	3	-		NC
Arsenic	mg/kg	3	-	-	NC	6	14		80
Barium	mg/kg	6	120	18	147.8	37	31		18
Cadmium	mg/kg	0.2	1.7	0.2	157.9	-	-		NC
Chromium	mg/kg	4.5	25	15	50.0	29	37		24
Cobalt	mg/kg	0.4	19	6.8	<b>94.6</b>	13	16		21
Copper	mg/kg	6	51	15	109	20	20		0
Lead	mg/kg	2	34	9	116.3	19	19		0
Mercury	mg/kg	0.4	-	-	NC	-	-		NC
Molybdenum	mg/kg	0.6	1.8	-	NC	-	1		NC
Nickel	mg/kg	0.9	57	23	<b>85.0</b>	35	31		12
Selenium	mg/kg	3	-	-	NC	-	-		NC
Vanadium	mg/kg	1.5	22	12	58.8	25	52		<b>70</b>
Zinc	mg/kg	2.5	390	87	<b>127.0</b>	87	78		11
<b>Miscellaneous</b>									
Total Phenols	mg/kg	0.01	0.02	0.02	0.0	na	na		NC
Total Cyanide	mg/kg	2.50	-	-	NC	na	na		NC
Chloride	mg/kg	5.00	na	na	NC	95	126		28
Fluoride	mg/kg	0.50	na	na	NC	-	-		NC
Sulphate	g/l	0.003	na	na	NC	-	0.006		NC
SVOCs	ug/kg	100	na	na	NC	na	na		NC
VOCs	ug/kg	1	na	na	NC	na	na		NC

"-" - Less than MDL

na - Not Analysed

NC - Not Calculable

**Bold** - % RPD greater than 40% and results reported greater than ten times the MDL.

\* - All individual SVOCs and VOCs were less than detection limit. No TICs were detected.

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 6: Relative Percentage Difference - Soil

Sample Type	Sample ID	Depth (m)	Date	Soil	Soil	%RPDs	Soil	Soil	%RPDs
				BH328	QA3 - Duplicate of BH328		BH329	QA4 - Duplicate of BH329	
				0.5	0.5		1.0	0.5	
				13-Oct-08	13-Oct-08		13-Oct-08	13-Oct-08	
<b>Parameters</b>	<b>Units</b>	<b>MDL</b>							
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	mg/kg	0.01	-	-	NC	-	-	-	NC
C7-C8	mg/kg	0.01	-	-	NC	-	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC	-	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC	-	-	-	NC
C12-C16	mg/kg	0.1	-	-	NC	-	-	-	NC
C16-C21	mg/kg	0.1	-	-	NC	-	-	-	NC
C21-C35	mg/kg	0.1	-	-	NC	-	-	-	NC
Total Aromatics	mg/kg	0.1	-	-	NC	-	-	-	NC
<b>Aliphatics</b>									
C5-C6	mg/kg	0.01	-	-	NC	-	-	-	NC
C6-C8	mg/kg	0.01	-	-	NC	-	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC	-	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC	-	-	-	NC
C12-C16	mg/kg	0.1	-	-	NC	-	-	-	NC
C16-C21	mg/kg	0.1	-	-	NC	-	-	-	NC
C21-C35	mg/kg	0.1	-	-	NC	-	-	-	NC
Total Aliphatics (MO)	mg/kg	0.1	-	-	NC	-	-	-	NC
Total TPH	mg/kg	0.1	-	-	NC	-	-	-	NC
<b>BTEX</b>									
Benzene	mg/kg	0.01	-	-	NC	-	-	-	NC
Toluene	mg/kg	0.01	-	-	NC	-	-	-	NC
Ethylbenzene	mg/kg	0.01	-	-	NC	-	-	-	NC
Total Xylene	mg/kg	0.01	-	-	NC	-	-	-	NC
BTEX	mg/kg	nv	-	-	NC	-	-	-	NC
MTBE	mg/kg	0.01	-	-	NC	-	-	-	NC
<b>TOC</b>									
Total Organic Carbon	%	0.2	0.2	0.3	40.00	0.8	0.5		46.15
<b>PAHs</b>									
Naphthalene	ug/kg	1	-	-	NC	-	-	-	NC
Acenaphthylene	ug/kg	1	-	-	NC	-	-	-	NC
Acenaphthene	ug/kg	1	-	-	NC	-	-	-	NC
Fluorene	ug/kg	1	-	-	NC	-	-	-	NC
Phenanthrene	ug/kg	1	-	-	NC	-	-	-	NC
Anthracene	ug/kg	1	-	-	NC	-	-	-	NC
Fluoranthene	ug/kg	1	-	-	NC	-	-	-	NC
Pyrene	ug/kg	1	-	-	NC	-	-	-	NC
Benzo(a)anthracene	ug/kg	1	-	-	NC	-	-	-	NC
Chrysene	ug/kg	1	-	-	NC	-	-	-	NC
Benzo(b)+Benzo(k)fluoranthene	ug/kg	1	-	-	NC	-	-	-	NC
Benzo(a)pyrene	ug/kg	1	-	-	NC	-	-	-	NC
Indeno(123cd)pyrene	ug/kg	1	-	-	NC	-	-	-	NC
Dibenzo(ah)anthracene	ug/kg	1	-	-	NC	-	-	-	NC
Benzo(ghi)perylene	ug/kg	1	-	-	NC	-	-	-	NC
Total 16 EPA PAHs (16)	ug/kg	nv	-	-	NC	-	-	-	NC
<b>PCBs</b>									
PCB Total of 7 Congeners	ug/kg	1	na	na	NC	na	na		NC
<b>Heavy Metals</b>									
Antimony	mg/kg	1.5	3.3	2.8	16	3.3	-		NC
Arsenic	mg/kg	3	6	9	40	15	17		13
Barium	mg/kg	6	40	36	11	34	44		26
Cadmium	mg/kg	0.2	-	0.3	NC	0.2	-		NC
Chromium	mg/kg	4.5	31	28	10	27	33		20
Cobalt	mg/kg	0.4	15	16	6	13	21		47
Copper	mg/kg	6	31	29	7	23	38		49
Lead	mg/kg	2	16	21	27	15	23		42
Mercury	mg/kg	0.4	-	-	NC	-	-		NC
Molybdenum	mg/kg	0.6	-	-	NC	-	1		NC
Nickel	mg/kg	0.9	43	43	0	37	38		3
Selenium	mg/kg	3	-	-	NC	-	-		NC
Vanadium	mg/kg	1.5	20	19	5	19	48		87
Zinc	mg/kg	2.5	76	85	11	81	94		15
<b>Miscellaneous</b>									
Total Phenols	mg/kg	0.01	0.04	0.04	0	0.02	0.02		0
Total Cyanide	mg/kg	2.50	-	-	NC	-	-		NC
Chloride	mg/kg	5.00	na	na	NC	na	na		NC
Fluoride	mg/kg	0.50	na	na	NC	na	na		NC
Sulphate	g/l	0.003	na	na	NC	na	na		NC
SVOCs	ug/kg	100	na	na	NC	na	- *		NC
VOCs	ug/kg	1	na	na	NC	na	- *		NC

"-" - Less than MDL

na - Not Analysed

NC - Not Calculable

**Bold** - % RPD greater than 40% and results reported greater than ten times

\* - All individual SVOCs and VOCs were less than detection limit. No TIC

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 6: Relative Percentage Difference - Soil

Sample Type	Sample ID	Depth (m)	Date	Soil	Soil	%RPDs	Soil	Soil	%RPDs
				BH333	QA7 - Duplicate of BH333		TP08	QA8 - Duplicate of TP08	
				2.0	2.0		1.0	1.0	
				15-Oct-08	15-Oct-08		15-Oct-08	15-Oct-08	
Parameters	Units	MDL							
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	mg/kg	0.01	-	-	NC	-	-	-	NC
C7-C8	mg/kg	0.01	-	-	NC	-	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC	-	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC	-	-	-	NC
C12-C16	mg/kg	0.1	-	-	NC	2.205	11.035		<b>133.38</b>
C16-C21	mg/kg	0.1	-	-	NC	0.271	0.652		<b>82.56</b>
C21-C35	mg/kg	0.1	-	-	NC	-	-		NC
Total Aromatics	mg/kg	0.1	-	-	NC	2.476	11.687		
<b>Aliphatics</b>									
C5-C6	mg/kg	0.01	-	-	NC	-	-		NC
C6-C8	mg/kg	0.01	-	-	NC	-	-		NC
C8-C10	mg/kg	0.01	-	-	NC	-	-		NC
C10-C12	mg/kg	0.01	-	-	NC	-	-		NC
C12-C16	mg/kg	0.1	-	-	NC	2628	2484		5.63
C16-C21	mg/kg	0.1	-	-	NC	2095	1929		8.25
C21-C35	mg/kg	0.1	-	-	NC	1684	1565		7.33
Total Aliphatics (MO)	mg/kg	0.1	-	-	NC	6407	5978		6.93
Total TPH	mg/kg	0.1	-	-	NC	6409	5990		6.77
<b>BTEX</b>									
Benzene	mg/kg	0.01	-	-	NC	-	-		NC
Toluene	mg/kg	0.01	-	-	NC	-	-		NC
Ethylbenzene	mg/kg	0.01	-	-	NC	-	-		NC
Total Xylene	mg/kg	0.01	-	-	NC	-	-		NC
BTEX	mg/kg	nv	-	-	NC	-	-		NC
MTBE	mg/kg	0.01	-	-	NC	-	-		NC
<b>TOC</b>									
Total Organic Carbon	%	0.2	1.3	0.9	36.36	3.2	1.7		61.22
<b>PAHs</b>									
Naphthalene	ug/kg	1	na	na	NC	na	na		NC
Acenaphthylene	ug/kg	1	na	na	NC	na	na		NC
Acenaphthene	ug/kg	1	na	na	NC	na	na		NC
Fluorene	ug/kg	1	na	na	NC	na	na		NC
Phenanthrene	ug/kg	1	na	na	NC	na	na		NC
Anthracene	ug/kg	1	na	na	NC	na	na		NC
Fluoranthene	ug/kg	1	na	na	NC	na	na		NC
Pyrene	ug/kg	1	na	na	NC	na	na		NC
Benzo(a)anthracene	ug/kg	1	na	na	NC	na	na		NC
Chrysene	ug/kg	1	na	na	NC	na	na		NC
Benzo(b)+Benzo(k)fluoranthene	ug/kg	1	na	na	NC	na	na		NC
Benzo(a)pyrene	ug/kg	1	na	na	NC	na	na		NC
Indeno(123cd)pyrene	ug/kg	1	na	na	NC	na	na		NC
Dibenzo(ah)anthracene	ug/kg	1	na	na	NC	na	na		NC
Benzo(ghi)perylene	ug/kg	1	na	na	NC	na	na		NC
Total 16 EPA PAHs (16)	ug/kg	nv	na	na	NC	na	na		NC
<b>PCBs</b>									
PCB Total of 7 Congeners	ug/kg	1	na	na	NC	na	-		NC
<b>Heavy Metals</b>									
Antimony	mg/kg	1.5	2.9	2.5	15	-	3		NC
Arsenic	mg/kg	3	6	4	40	24	6		120
Barium	mg/kg	6	30	43	36	34	65		63
Cadmium	mg/kg	0.2	-	-	NC	-	-		NC
Chromium	mg/kg	4.5	27	25	8	31	31		0
Cobalt	mg/kg	0.4	12	10	18	1	13		171
Copper	mg/kg	6	20	17	16	35	27		26
Lead	mg/kg	2	22	17	26	78	45		<b>54</b>
Mercury	mg/kg	0.4	-	-	NC	-	-		NC
Molybdenum	mg/kg	0.6	-	0.8	NC	-	0.7		NC
Nickel	mg/kg	0.9	30	25	18	31	41		28
Selenium	mg/kg	3	-	-	NC	-	-		NC
Vanadium	mg/kg	1.5	22	24	9	247	27		<b>161</b>
Zinc	mg/kg	2.5	75	61	21	60	82		31
<b>Miscellaneous</b>									
Total Phenols	mg/kg	0.01	na	na	NC	na	na		NC
Total Cyanide	mg/kg	2.50	na	na	NC	na	na		NC
Chloride	mg/kg	5.00	na	na	NC	na	57		NC
Fluoride	mg/kg	0.50	na	na	NC	na	4		NC
Sulphate	g/l	0.003	na	na	NC	na	0.011		NC
SVOCs	ug/kg	100	na	na	NC	na	na		NC
VOCs	ug/kg	1	na	na	NC	na	na		NC

"-" - Less than MDL

na - Not Analysed

NC - Not Calculable

**Bold** - % RPD greater than 40% and results reported greater than ten times

\* - All individual SVOCs and VOCs were less than detection limit. No TIC

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 6: Relative Percentage Difference - Soil

Sample Type	Sample ID	Depth (m)	Date	Soil	Soil	%RPDs	Soil	Soil	%RPDs
				TP18	QA9 - Duplicate of TP18		TP18	QA10 - Duplicate of TP18	
Parameters	Units	MDL							
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	mg/kg	0.01	-	-	NC	-	-	-	NC
C7-C8	mg/kg	0.01	-	-	NC	-	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC	-	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC	-	-	-	NC
C12-C16	mg/kg	0.1	0.306	0.567	<b>59.79</b>	2.116	2.759	26.38	
C16-C21	mg/kg	0.1	0.434	0.847	<b>64.48</b>	2.433	3.455	34.71	
C21-C35	mg/kg	0.1	0.114	0.195	<b>52.43</b>	0.717	0.802	11.19	
Total Aromatics	mg/kg	0.1	0.854	1.609	<b>61.31</b>	5.266	7.016	28.50	
<b>Aliphatics</b>									
C5-C6	mg/kg	0.01	-	-	NC	-	-	-	NC
C6-C8	mg/kg	0.01	-	-	NC	-	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC	-	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC	-	-	-	NC
C12-C16	mg/kg	0.1	-	-	NC	-	-	-	NC
C16-C21	mg/kg	0.1	-	-	NC	-	-	-	NC
C21-C35	mg/kg	0.1	-	-	NC	-	-	-	NC
Total Aliphatics (MO)	mg/kg	0.1	-	-	NC	-	-	-	NC
Total TPH	mg/kg	0.1	0.854	1.609	<b>61.31</b>	5.266	7.016	28.50	
<b>BTEX</b>									
Benzene	mg/kg	0.01	-	-	NC	-	-	-	NC
Toluene	mg/kg	0.01	-	-	NC	-	-	-	NC
Ethylbenzene	mg/kg	0.01	-	-	NC	-	-	-	NC
Total Xylene	mg/kg	0.01	-	-	NC	-	-	-	NC
BTEX	mg/kg	nv	-	-	NC	-	-	-	NC
MTBE	mg/kg	0.01	-	-	NC	-	-	-	NC
<b>TOC</b>									
Total Organic Carbon	%	0.2	2	1.7	16.22	11.3	8.6	27.14	
<b>PAHs</b>									
Naphthalene	ug/kg	1	na	6	NC	27	25	7.69	
Acenaphthylene	ug/kg	1	na	15	NC	52	69	28.10	
Acenaphthene	ug/kg	1	na	19	NC	20	28	33.33	
Fluorene	ug/kg	1	na	4	NC	13	17	26.67	
Phenanthrene	ug/kg	1	na	69	NC	316	433	31.24	
Anthracene	ug/kg	1	na	19	NC	63	93	38.46	
Fluoranthene	ug/kg	1	na	255	NC	927	1205	26.08	
Pyrene	ug/kg	1	na	186	NC	725	914	23.06	
Benzo(a)anthracene	ug/kg	1	na	445	NC	1109	1868	<b>50.99</b>	
Chrysene	ug/kg	1	na	163	NC	467	503	7.42	
Benzo(b)+Benzo(k) fluoranthene	ug/kg	1	na	239	NC	857	1084	23.39	
Benzo(a)pyrene	ug/kg	1	na	114	NC	412	515	22.22	
Indeno(123cd)pyrene	ug/kg	1	na	62	NC	267	309	14.58	
Dibenzo(ah)anthracene	ug/kg	1	na	38	NC	120	108	10.53	
Benzo(ghi)perylene	ug/kg	1	na	95	NC	330	385	15.38	
Total 16 EPA PAHs (16)	ug/kg	nv	na	1729	NC	5705	7556	27.92	
<b>PCBs</b>									
PCB Total of 7 Congeners	ug/kg	1	na	na	NC	na	na	NC	
<b>Heavy Metals</b>									
Antimony	mg/kg	1.5	-	-	NC	-	-	-	NC
Arsenic	mg/kg	3	13	10	26	11	15	31	
Barium	mg/kg	6	144	74	<b>64</b>	126	173	31	
Cadmium	mg/kg	0.2	-	-	NC	-	-	-	NC
Chromium	mg/kg	4.5	23	23	0	19	27	35	
Cobalt	mg/kg	0.4	17	14	19	9	13	36	
Copper	mg/kg	6	44	35	23	59	71	18	
Lead	mg/kg	2	152	97	<b>44</b>	295	422	35	
Mercury	mg/kg	0.4	-	-	NC	-	-	-	NC
Molybdenum	mg/kg	0.6	1	2	67	1	2	67	
Nickel	mg/kg	0.9	-	31	NC	21	29	32	
Selenium	mg/kg	3	-	-	NC	-	-	-	NC
Vanadium	mg/kg	1.5	67	61	9	47	65	32	
Zinc	mg/kg	2.5	115	93	21	118	161	31	
<b>Miscellaneous</b>									
Total Phenols	mg/kg	0.01	na	0.02	NC	0.04	0.02	67	
Total Cyanide	mg/kg	2.50	na	-	NC	-	-	-	NC
Chloride	mg/kg	5.00	na	na	NC	na	na	NC	
Fluoride	mg/kg	0.50	na	na	NC	na	na	NC	
Sulphate	g/l	0.003	na	na	NC	na	na	NC	
SVOCs	ug/kg	100	na	na	NC	na	na	NC	
VOCs	ug/kg	1	na	na	NC	na	na	NC	

"-" - Less than MDL

na - Not Analysed

NC - Not Calculable

**Bold** - % RPD greater than 40% and results reported greater than ten times

\* - All individual SVOCs and VOCs were less than detection limit. No TIC

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 6: Relative Percentage Difference - Soil

Sample Type	Sample ID	Depth (m)	Date	Soil		%RPDs
				HS12	QA11 - Duplicate of HS12	
				0.20	0.20	
				20-Oct-08	20-Oct-08	
Parameters	Units	MDL				
<b>Hydrocarbons</b>						
<b>Aromatics</b>						
C6-C7	mg/kg	0.01	-	-		NC
C7-C8	mg/kg	0.01	-	-		NC
C8-C10	mg/kg	0.01	-	-		NC
C10-C12	mg/kg	0.01	-	-		NC
C12-C16	mg/kg	0.1	-	-		NC
C16-C21	mg/kg	0.1	-	-		NC
C21-C35	mg/kg	0.1	-	-		NC
Total Aromatics	mg/kg	0.1	-	-		NC
<b>Aliphatics</b>						
C5-C6	mg/kg	0.01	-	-		NC
C6-C8	mg/kg	0.01	-	-		NC
C8-C10	mg/kg	0.01	-	-		NC
C10-C12	mg/kg	0.01	-	-		NC
C12-C16	mg/kg	0.1	-	-		NC
C16-C21	mg/kg	0.1	-	-		NC
C21-C35	mg/kg	0.1	-	-		NC
Total Aliphatics (MO)	mg/kg	0.1	-	-		NC
Total TPH	mg/kg	0.1	-	-		NC
<b>BTEX</b>						
Benzene	mg/kg	0.01	-	-		NC
Toluene	mg/kg	0.01	-	-		NC
Ethylbenzene	mg/kg	0.01	-	-		NC
Total Xylene	mg/kg	0.01	-	-		NC
BTEX	mg/kg	nv	-	-		NC
MTBE	mg/kg	0.01	-	-		NC
<b>TOC</b>						
Total Organic Carbon	%	0.2	2.4	2.1		13.33
<b>PAHs</b>						
Naphthalene	ug/kg	1	-	-		NC
Acenaphthylene	ug/kg	1	-	-		NC
Acenaphthene	ug/kg	1	-	-		NC
Fluorene	ug/kg	1	-	-		NC
Phenanthrene	ug/kg	1	-	-		NC
Anthracene	ug/kg	1	-	-		NC
Fluoranthene	ug/kg	1	-	-		NC
Pyrene	ug/kg	1	-	-		NC
Benzo(a)anthracene	ug/kg	1	-	-		NC
Chrysene	ug/kg	1	-	-		NC
Benzo(b)+Benzo(k)fluoranthene	ug/kg	1	-	-		NC
Benzo(a)pyrene	ug/kg	1	-	-		NC
Indeno(123cd)pyrene	ug/kg	1	-	-		NC
Dibenzo(ah)anthracene	ug/kg	1	-	-		NC
Benzo(ghi)perylene	ug/kg	1	-	-		NC
Total 16 EPA PAHs (16)	ug/kg	nv	-	-		NC
<b>PCBs</b>						
PCB Total of 7 Congeners	ug/kg	1	na	na		NC
<b>Heavy Metals</b>						
Antimony	mg/kg	1.5	-	-		NC
Arsenic	mg/kg	3	2	2		0
Barium	mg/kg	6	67	67		0
Cadmium	mg/kg	0.2	-	-		NC
Chromium	mg/kg	4.5	31	31		0
Cobalt	mg/kg	0.4	15	17		13
Copper	mg/kg	6	33	38		14
Lead	mg/kg	2	28	31		10
Mercury	mg/kg	0.4	-	-		NC
Molybdenum	mg/kg	0.6	2	2		0
Nickel	mg/kg	0.9	143	207		37
Selenium	mg/kg	3	-	-		NC
Vanadium	mg/kg	1.5	633	934		38
Zinc	mg/kg	2.5	257	215		18
<b>Miscellaneous</b>						
Total Phenols	mg/kg	0.01	0.06	0.02		100
Total Cyanide	mg/kg	2.50	-	-		NC
Chloride	mg/kg	5.00	na	na		NC
Fluoride	mg/kg	0.50	na	na		NC
Sulphate	g/l	0.003	na	na		NC
SVOCs	ug/kg	100	na	na		NC
VOCs	ug/kg	1	na	na		NC

"-" - Less than MDL

na - Not Analysed

NC - Not Calculable

**Bold** - % RPD greater than 40% and results reported greater than ten times

\* - All individual SVOCs and VOCs were less than detection limit. No TIC

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 7 :** Asbestos Identification Results - Soil

Sample Location	Depth Sampled (m)	Material Sampled	Asbestos Detected / Type (Primary Samples)	Asbestos Detected / Type (Duplicate Samples)
HS1	0.20	Soil	No asbestos detected	na
HS2	0.10	Soil	No asbestos detected	na
HS3	0.10	Soil	Chrysotile	No asbestos detected
HS3A*	0.10	Soil	No asbestos detected	na
HS3B*	0.10	Soil	No asbestos detected	na
HS3C*	0.10	Soil	No asbestos detected	na
HS3D*	0.10	Soil	No asbestos detected	na
HS4	0.10	Soil	No asbestos detected	na
HS5	0.10	Soil	No asbestos detected	na
HS6	0.10	Soil	No asbestos detected	na
HS7	0.10	Soil	No asbestos detected	na
HS8	0.10	Soil	No asbestos detected	na
HS9	0.10	Soil	No asbestos detected	na
HS10	0.10	Soil	No asbestos detected	na
HS11	0.10	Soil	No asbestos detected	na
HS12	0.10	Soil	No asbestos detected	na
BH301	0.50	Soil	No asbestos detected	na
BH302	0.50	Soil	No asbestos detected	na
BH303	0.50	Soil	No asbestos detected	na
BH304	0.50	Soil	No asbestos detected	na
BH305	0.50	Soil	No asbestos detected	na
BH306	0.50	Soil	No asbestos detected	na
BH307	0.50	Soil	No asbestos detected	na
BH308	0.50	Soil	No asbestos detected	na
BH309	0.50	Soil	No asbestos detected	na
BH310	0.50	Soil	No asbestos detected	na
BH312	0.50	Soil	No asbestos detected	na
BH313	0.50	Soil	No asbestos detected	na
BH315	0.50	Soil	No asbestos detected	na
BH316	0.50	Soil	No asbestos detected	na
BH320	0.50	Soil	No asbestos detected	na
BH322	0.50	Soil	No asbestos detected	na
BH323	0.50	Soil	No asbestos detected	na
BH324	0.50	Soil	No asbestos detected	na
BH325	0.50	Soil	No asbestos detected	na
BH326	0.50	Soil	No asbestos detected	na
BH327	0.50	Soil	No asbestos detected	na
BH328	0.50	Soil	No asbestos detected	na
BH329	0.50	Soil	No asbestos detected	na
BH330	0.50	Soil	No asbestos detected	na
BH331	0.50	Soil	No asbestos detected	na
BH332	0.50	Soil	No asbestos detected	na
BH333	0.50	Soil	No asbestos detected	na
TP01	0.40	Soil	No asbestos detected	na
TP02	0.40	Soil	No asbestos detected	na
TP03	0.30	Soil	No asbestos detected	na
TP04	0.40	Soil	No asbestos detected	na
TP05	0.40	Soil	No asbestos detected	na
TP06	0.30	Soil	No asbestos detected	na
TP07	0.30	Soil	No asbestos detected	na
TP08	0.30	Soil	No asbestos detected	na
TP09	0.20	Soil	No asbestos detected	na
TP10	0.40	Soil	No asbestos detected	na
TP11	0.30	Soil	No asbestos detected	na
TP12	0.30	Soil	No asbestos detected	na
TP13	0.30	Soil	No asbestos detected	na
TP14	0.30	Soil	No asbestos detected	na
TP15	0.15	Soil	No asbestos detected	na
TP16	0.40	Soil	No asbestos detected	na
TP17	0.30	Soil	No asbestos detected	na
TP18	0.25	Soil	No asbestos detected	na

Note: Detection limit <0.01 %

\* Bracketing sampling around HS3

na Not analysed

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 8 : Sediment Analytical Results - Hydrocarbons

Island Area

Sample Type	Soil													
Sample ID	SED01	SED02	SED03	SED04	SED05	SED06	SED07	SED08	SED09					
Depth (m)	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN					
Date	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08					
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value								
<b>Hydrocarbons</b>														
<b>Aromatics</b>														
C6-C7	mg/kg	0.01	0.106	650	nv	nv	-	-	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.133	670	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.167	230	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.263	45,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.524	73,000	nv	nv	-	0.252	0.303	-	0.113	-	-	-
C16-C21	mg/kg	0.1	1.65	57,000	nv	nv	-	0.292	0.34	-	0.114	-	-	-
C21-C35	mg/kg	0.1	13.1	57,000	nv	nv	-	-	-	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	0.544	0.643	-	0.227	-	-	-
<b>Aliphatics</b>														
C5-C6	mg/kg	0.01	0.093	370	nv	nv	-	-	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.429	740	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	3.32	230,000	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	26.2	150,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	523	180,000	nv	nv	-	-	-	-	6	-	-	-
C16-C21	mg/kg	0.1	65,800	IR	nv	nv	-	-	-	-	20	-	-	-
C21-C35	mg/kg	0.1	791,000	nv	nv	nv	-	-	-	-	18	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	<b>5000</b>	-	-	-	-	44	-	-	-
Total TPH	mg/kg	0.1	0.093	nv	nv	nv	-	0.544	0.643	-	44.227	-	-	-
<b>BTEX</b>														
Benzene	mg/kg	0.01	0.00156	1.5	0.01	<b>1</b>	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0162	150	0.01	<b>130</b>	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0467	48,000	0.03	<b>50</b>	-	-	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0458	320	0.1	<b>25</b>	-	-	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.00699	1,780	nv	<b>100</b>	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 8 : Sediment Analytical Results - Hydrocarbons

Island Area

Sample Type								Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID								SED10	SED11	SED12	SED14	QA12 - Duplicate of SED14	SED15	QA13 - Duplicate of SED15
Depth (m)								UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Date								15-Oct-08	15-Oct-08	15-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value								
<b>Hydrocarbons</b>														
<b>Aromatics</b>														
C6-C7	mg/kg	0.01	0.106	650	nv	nv	-	-	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.133	670	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.167	230	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.263	45,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.524	73,000	nv	nv	0.264	0.226	0.15	1.733	-	-	-	-
C16-C21	mg/kg	0.1	1.65	57,000	nv	nv	0.397	0.407	0.216	1.095	-	-	-	-
C21-C35	mg/kg	0.1	13.1	57,000	nv	nv	-	-	-	0.265	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	0.661	0.633	0.366	3.093	-	-	-	-
<b>Aliphatics</b>														
C5-C6	mg/kg	0.01	0.093	370	nv	nv	-	-	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.429	740	nv	nv	-	-	-	-	-	-	-	-
C8-C10	mg/kg	0.01	3.32	230,000	nv	nv	-	-	-	-	-	-	-	-
C10-C12	mg/kg	0.01	26.2	150,000	nv	nv	-	-	-	-	-	-	-	-
C12-C16	mg/kg	0.1	523	180,000	nv	nv	-	-	-	-	-	-	-	-
C16-C21	mg/kg	0.1	65,800	IR	nv	nv	-	-	-	-	-	-	-	-
C21-C35	mg/kg	0.1	791,000	nv	nv	nv	-	-	-	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	5000	-	-	-	-	-	-	-	-
Total TPH	mg/kg	0.1	0.093	nv	nv	nv	0.661	0.633	0.366	3.093	-	-	-	-
<b>BTEX</b>														
Benzene	mg/kg	0.01	0.00156	1.5	0.01	1	-	-	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0162	150	0.01	130	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0467	48,000	0.03	50	-	-	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0458	320	0.1	25	-	-	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.00699	1,780	nv	100	-	-	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 8 : Sediment Analytical Results - Hydrocarbons

Island Area

Sample Type							Soil	Soil	Soil	Soil	Soil	Soil
Sample ID							SED16	SED17	QA14 - Duplicate of SED17	SED18	SED21	SED 25
Depth (m)							UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	0.1
Date							20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	30-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value						
<b>Hydrocarbons</b>												
<b>Aromatics</b>												
C6-C7	mg/kg	0.01	0.106	650	nv	nv	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.133	670	nv	nv	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.167	230	nv	nv	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.263	45,000	nv	nv	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.524	73,000	nv	nv	-	-	-	0.293	-	-
C16-C21	mg/kg	0.1	1.65	57,000	nv	nv	-	-	-	0.231	-	-
C21-C35	mg/kg	0.1	13.1	57,000	nv	nv	-	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-	0.524	-	-
<b>Aliphatics</b>												
C5-C6	mg/kg	0.01	0.093	370	nv	nv	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.429	740	nv	nv	-	-	-	-	-	-
C8-C10	mg/kg	0.01	3.32	230,000	nv	nv	-	-	-	-	-	-
C10-C12	mg/kg	0.01	26.2	150,000	nv	nv	-	-	-	-	-	-
C12-C16	mg/kg	0.1	523	180,000	nv	nv	-	-	-	-	-	-
C16-C21	mg/kg	0.1	65,800	IR	nv	nv	-	-	-	-	-	-
C21-C35	mg/kg	0.1	791,000	nv	nv	nv	-	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	5000	-	-	-	-	-	-
Total TPH	mg/kg	0.1	0.093	nv	nv	nv	-	-	-	0.524	-	-
<b>BTEX</b>												
Benzene	mg/kg	0.01	0.00156	1.5	0.01	1	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0162	150	0.01	130	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0467	48,000	0.03	50	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0458	320	0.1	25	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.00699	1,780	nv	100	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 8 : Sediment Analytical Results - Hydrocarbons

Mainland Area

Sample Type							Soil	Soil	Soil	Soil	Soil	Soil
Sample ID							SED13	SED19	SED20	SED22	SED 23	SED 24
Depth (m)							UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	0.1
Date							15-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	30-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value						
<b>Hydrocarbons</b>												
<b>Aromatics</b>												
C6-C7	mg/kg	0.01	0.106	650	nv	nv	-	-	-	-	-	-
C7-C8	mg/kg	0.01	0.133	670	nv	nv	-	-	-	-	-	-
C8-C10	mg/kg	0.01	0.167	230	nv	nv	-	-	-	-	-	-
C10-C12	mg/kg	0.01	0.263	45,000	nv	nv	-	-	-	-	-	-
C12-C16	mg/kg	0.1	0.524	73,000	nv	nv	-	-	-	-	-	-
C16-C21	mg/kg	0.1	1.65	57,000	nv	nv	-	-	-	-	-	-
C21-C35	mg/kg	0.1	13.1	57,000	nv	nv	-	-	-	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-	-	-	-
<b>Aliphatics</b>												
C5-C6	mg/kg	0.01	0.093	370	nv	nv	-	-	-	-	-	-
C6-C8	mg/kg	0.01	0.429	740	nv	nv	-	-	-	-	-	-
C8-C10	mg/kg	0.01	3.32	230,000	nv	nv	-	-	-	-	-	-
C10-C12	mg/kg	0.01	26.2	150,000	nv	nv	-	-	-	-	-	-
C12-C16	mg/kg	0.1	523	180,000	nv	nv	-	-	-	-	-	-
C16-C21	mg/kg	0.1	65,800	IR	nv	nv	-	-	-	-	-	-
C21-C35	mg/kg	0.1	791,000	nv	nv	nv	-	-	-	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	<b>5000</b>	-	-	-	-	-	-
Total TPH	mg/kg	0.1	0.093	nv	nv	nv	-	-	-	-	-	-
<b>BTEX</b>												
Benzene	mg/kg	0.01	0.00156	1.5	0.01	<b>1</b>	-	-	-	-	-	-
Toluene	mg/kg	0.01	0.0162	150	0.01	<b>130</b>	-	-	-	-	-	-
Ethylbenzene	mg/kg	0.01	0.0467	48,000	0.03	<b>50</b>	-	-	-	-	-	-
Total Xylene	mg/kg	0.01	0.0458	320	0.1	<b>25</b>	-	-	-	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-
MTBE	mg/kg	0.01	0.00699	1,780	nv	<b>100</b>	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment  
 xx Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 9 :** Sediment Analytical Results - PAHs

Island Area

Sample Type															
Sample ID															
Depth (m)															
Date															
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil SED01	Soil SED02	Soil SED03	Soil SED04	Soil SED05	Soil SED06	Soil SED07	Soil SED08	Soil SED09
PAHs															
Naphthalene*	ug/kg	1	13.6	270,000	nv	nv	-	6	4	-	3	-	-	-	-
Acenaphthylene	ug/kg	1	588	2,100,000	nv	nv	-	6	2	-	3	-	-	-	-
Acenaphthene	ug/kg	1	56,700	34,000,000	nv	nv	-	5	27	-	30	-	-	-	-
Fluorene	ug/kg	1	35,100	69,000,000	nv	nv	-	8	3	-	2	-	-	-	-
Phenanthrene*	ug/kg	1	2,390	34,000,000	nv	nv	-	62	46	-	14	-	-	-	-
Anthracene*	ug/kg	1	30.8	52,000,000	nv	nv	-	13	8	-	3	-	-	-	-
Fluoranthene*	ug/kg	1	112	3,400,000	nv	nv	-	88	114	-	33	-	-	-	-
Pyrene	ug/kg	1	199,000	35,000,000	nv	nv	-	70	103	-	28	-	-	-	-
Benzo(a)anthracene*	ug/kg	1	35.7	340,000	nv	nv	-	112	115	-	41	-	-	-	-
Chrysene*	ug/kg	1	440	3,500,000	nv	nv	-	56	74	-	29	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	95	126	-	34	-	-	-	-
Benzo(a)pyrene*	ug/kg	1	106.7	35,000	nv	nv	-	36	22	-	13	-	-	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	29	25	-	10	-	-	-	-
Dibenzo(ah)anthracene	ug/kg	1	365	35,000	nv	nv	-	9	12	-	2	-	-	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	35	34	-	8	-	-	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	40,000	-	532	568	-	188	-	-	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	630	715	-	252	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
 xx Exceeds Controlled Waters Generic Assessment Criteria  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 9 :** Sediment Analytical Results - PAHs

Island Area

Sample Type	Island Area												
Sample ID													
Depth (m)													
Date													
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil SED10	Soil SED11	Soil SED12	Soil SED14	Soil QA12 - Duplicate of SED14	Soil SED15	Soil QA13 - Duplicate of SED15
							UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
							15-Oct-08	15-Oct-08	15-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08
<b>PAHs</b>													
Naphthalene*	ug/kg	1	13.6	270,000	nv	nv	3	5	4	27	-	-	-
Acenaphthylene	ug/kg	1	588	2,100,000	nv	nv	5	5	4	1	-	-	-
Acenaphthene	ug/kg	1	56,700	34,000,000	nv	nv	2	2	14	2	-	-	-
Fluorene	ug/kg	1	35,100	69,000,000	nv	nv	4	5	3	46	-	-	-
Phenanthrene*	ug/kg	1	2,390	34,000,000	nv	nv	36	43	20	670	-	-	-
Anthracene*	ug/kg	1	30.8	52,000,000	nv	nv	13	12	7	52	-	-	-
Fluoranthene*	ug/kg	1	112	3,400,000	nv	nv	108	88	57	462	-	-	-
Pyrene	ug/kg	1	199,000	35,000,000	nv	nv	96	71	45	500	-	-	-
Benzo(a)anthracene*	ug/kg	1	35.7	340,000	nv	nv	159	224	89	387	-	-	-
Chrysene*	ug/kg	1	440	3,500,000	nv	nv	56	54	36	369	-	-	-
Benzo(b)+Benzo(k)fluoranthene*	ug/kg	1	nv	350,000	nv	nv	136	103	70	339	-	-	-
Benzo(a)pyrene*	ug/kg	1	106.7	35,000	nv	nv	44	25	24	90	-	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	46	26	21	110	-	-	-
Dibenzo(ah)anthracene	ug/kg	1	365	35,000	nv	nv	7	7	6	25	-	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	55	37	28	130	-	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	40,000	656	617	356	2636	-	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	770	707	428	3209	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
xx Exceeds Controlled Waters Generic Assessment Criteria  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 9 :** Sediment Analytical Results - PAHs

Island Area

Sample Type							Soil	Soil	Soil	Soil	Soil	Soil
Sample ID							SED16	SED17	QA14 - Duplicate of SED17	SED18	SED21	SED 25
Depth (m)							UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	0.1
Date							20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	30-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value						
PAHs												
Naphthalene*	ug/kg	1	13.6	270,000	nv	nv	-	-	-	-	9	4
Acenaphthylene	ug/kg	1	588	2,100,000	nv	nv	-	-	-	-	4	6
Acenaphthene	ug/kg	1	56,700	34,000,000	nv	nv	-	-	-	-	4	4
Fluorene	ug/kg	1	35,100	69,000,000	nv	nv	-	-	-	-	6	4
Phenanthrene*	ug/kg	1	2,390	34,000,000	nv	nv	-	-	-	-	55	9
Anthracene*	ug/kg	1	30.8	52,000,000	nv	nv	-	-	-	-	7	3
Fluoranthene*	ug/kg	1	112	3,400,000	nv	nv	-	-	-	-	72	20
Pyrene	ug/kg	1	199,000	35,000,000	nv	nv	-	-	-	-	145	15
Benzo(a)anthracene*	ug/kg	1	35.7	340,000	nv	nv	-	-	-	-	68	22
Chrysene*	ug/kg	1	440	3,500,000	nv	nv	-	-	-	-	78	11
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	85	23
Benzo(a)pyrene*	ug/kg	1	106.7	35,000	nv	nv	-	-	-	-	30	7
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	30	7
Dibenzo(ah)anthracene	ug/kg	1	365	35,000	nv	nv	-	-	-	-	5	1
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	-	-	33	8
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	40,000	-	-	-	-	467	114
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	-	-	-	631	144

xx Exceeds Human Health Generic Assessment Criteria  
xx Exceeds Controlled Waters Generic Assessment Criteria  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 9 :** Sediment Analytical Results - PAHs

Mainland Area

Sample Type							Soil	Soil	Soil	Soil	Soil	Soil
Sample ID							SED13	SED19	SED20	SED22	SED 23	SED 24
Depth (m)							UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	0.1
Date							15-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	30-Oct-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value						
PAHs												
Naphthalene*	ug/kg	1	13.6	270,000	nv	nv	-	-	-	-	-	-
Acenaphthylene	ug/kg	1	588	2,100,000	nv	nv	-	-	-	-	-	-
Acenaphthene	ug/kg	1	56,700	34,000,000	nv	nv	-	-	-	-	-	-
Fluorene	ug/kg	1	35,100	69,000,000	nv	nv	-	-	-	-	-	-
Phenanthrene*	ug/kg	1	2,390	34,000,000	nv	nv	-	-	-	-	-	-
Anthracene*	ug/kg	1	30.8	52,000,000	nv	nv	-	-	-	-	-	-
Fluoranthene*	ug/kg	1	112	3,400,000	nv	nv	-	-	-	-	-	-
Pyrene	ug/kg	1	199,000	35,000,000	nv	nv	-	-	-	-	-	-
Benzo(a)anthracene*	ug/kg	1	35.7	340,000	nv	nv	-	-	-	-	-	-
Chrysene*	ug/kg	1	440	3,500,000	nv	nv	-	-	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	-	-
Benzo(a)pyrene*	ug/kg	1	106.7	35,000	nv	nv	-	-	-	-	-	-
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	-	-	-	-	-	-
Dibenzo(ah)anthracene	ug/kg	1	365	35,000	nv	nv	-	-	-	-	-	-
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	-	-	-	-	-	-
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	<b>40,000</b>	-	-	-	-	-	-
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	-	-	-	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
xx Exceeds Controlled Waters Generic Assessment Criteria  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value



**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 11 :** Sediment Analytical Results - Heavy Metals

Island Area

Sample Type	Island Area															
Sample ID																
Depth (m)																
Date																
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	EPA Background	Dutch MAC Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil SED01	Soil SED02	Soil SED03	Soil SED04	Soil SED05	Soil SED06	Soil SED07	Soil SED08	Soil SED09
<b>Heavy Metals</b>																
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	2.1	-	1.6	-	2	-	2.3	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	55	9	12	5	12	6	18	8	17	10
Barium	mg/kg	6	4.11	28,000	454.5	160	625	26	31	20	20	23	19	29	15	21
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	0.2	-	0.3	-	-	-	-	-	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	20	22	24	25	29	24	23	23	24
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	7.8	7	8.7	6	9.7	11	11	10	9
Copper	mg/kg	6	0.035	IR	45.9	36	190	10	26	11	8	11	20	14	13	16
Lead	mg/kg	2	0.399	750	61.9	85	530	10	21	15	11	16	35	9	17	17
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	1.1	2	4.5	6	-	4	-	2	1
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	29	20	120	24	29	21	38	30	24
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	33	69	370	79	23	654	42	63	58
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	60	127	88	47	95	382	99	181	141

- xx Exceeds Human Health Generic Assessment
- xx Exceeds Controlled Waters Generic
- xx Exceeding EPA Background 95 Percentile
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 11 :** Sediment Analytical Results - Heavy Metals

Island Area

Sample Type	Island Area												
Sample ID													
Depth (m)													
Date													
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil SED10	Soil SED11	Soil SED12	Soil SED14	Soil QA12 - Duplicate of SED14	Soil SED15
								15-Oct-08	15-Oct-08	15-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08
<b>Heavy Metals</b>													
Antimony	mg/kg	1.5	0.226	15	1.54	3	<b>15</b>	-	-	-	-	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	<b>55</b>	11	8	10	6	5	13
Barium	mg/kg	6	4.11	28,000	454.5	160	<b>625</b>	48	23	39	35	40	24
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	<b>12</b>	-	-	-	-	-	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	<b>380</b>	32	18	20	35	33	19
Cobalt	mg/kg	0.4	33	3,000	15.1	9	<b>240</b>	11	6	7	12	10	8
Copper	mg/kg	6	0.035	IR	45.9	36	<b>190</b>	37	10	10	16	15	10
Lead	mg/kg	2	0.399	750	61.9	85	<b>530</b>	22	12	16	18	21	9
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	<b>10</b>	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	<b>200</b>	7	4	2	6	5	1
Nickel	mg/kg	0.9	1.91	5,000	50	35	<b>210</b>	29	9	16	201	166	33
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	<b>100</b>	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	<b>250</b>	89	44	81	<b>569</b>	<b>546</b>	69
Zinc	mg/kg	2.5	0.289	IR	144.7	140	<b>720</b>	436	46	62	96	89	52

- xx Exceeds Human Health Generic Assessment
- xx Exceeds Controlled Waters Generic
- xx Exceeding EPA Background 95 Percentile
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 11 :** Sediment Analytical Results - Heavy Metals

Island Area

Sample Type	Sample ID	Depth (m)	Date					Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	EPA Background	Dutch MAC Screening (S) Value	Dutch MAC - Intervention (I) Value	QA13 - Duplicate of SED15	SED16	SED17	QA14 - Duplicate of SED17
								UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	0.1
								20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	30-Oct-08
<b>Heavy Metals</b>														
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	-	-	-	-	-	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	55	14	9	10	9	12	10	13
Barium	mg/kg	6	4.11	28,000	454.5	160	625	16	32	14	21	33	28	47
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	-	-	-	-	-	-	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	36	20	28	30	18	20	31
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	10	7	12	13	6	7	10
Copper	mg/kg	6	0.035	IR	45.9	36	190	9	6	14	16	11	12	8
Lead	mg/kg	2	0.399	750	61.9	85	530	8	16	8	6	10	18	24
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	1	1	1	-	1	-	1
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	30	10	40	37	21	11	16
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	57	55	70	61	56	57	84
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	50	56	72	67	55	52	88

- xx Exceeds Human Health Generic Assessment
- xx Exceeds Controlled Waters Generic
- xx Exceeding EPA Background 95 Percentile
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 11 :** Sediment Analytical Results - Heavy Metals

Mainland Area

Sample Type													
Sample ID													
Depth (m)													
Date													
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	EPA Background	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil SED13	Soil SED19	Soil SED20	Soil SED22	Soil SED 23	Soil SED 24
<b>Heavy Metals</b>													
Antimony	mg/kg	1.5	0.226	15	1.54	3	15	2.9	-	-	-	-	-
Arsenic	mg/kg	3	0.294	500	21.9	29	55	9	4	4	9	13	10
Barium	mg/kg	6	4.11	28,000	454.5	160	625	26	209	10	25	28	19
Cadmium	mg/kg	0.2	0.55	1,400	1.652	0.8	12	0.6	-	-	-	-	-
Chromium	mg/kg	4.5	6.50	5,000	86.8	100	380	19	15	10	23	21	33
Cobalt	mg/kg	0.4	33	3,000	15.1	9	240	7.9	13	3	9	8	15
Copper	mg/kg	6	0.035	IR	45.9	36	190	15	30	22	14	9	13
Lead	mg/kg	2	0.399	750	61.9	85	530	18	17	8	12	16	6
Mercury	mg/kg	0.4	0.006	480	0.237	0.3	10	-	-	-	-	-	-
Molybdenum	mg/kg	0.6	1.41	1,310	3.29	3	200	0.9	1	1	1	1	1
Nickel	mg/kg	0.9	1.91	5,000	50	35	210	23	19	8	25	19	37
Selenium	mg/kg	3	0.05	8,000	2.67	0.7	100	-	-	-	-	-	-
Vanadium	mg/kg	1.5	20	23,400	104.8	42	250	25	81	93	55	60	74
Zinc	mg/kg	2.5	0.289	IR	144.7	140	720	100	113	21	98	62	67

- xx Exceeds Human Health Generic Assessment
- xx Exceeds Controlled Waters Generic
- xx Exceeding EPA Background 95 Percentile
- MDL Method Detection Limit
- Less than MDL
- na Not Analysed
- nv No Value
- IR Insignificant risk to identified

Note: There may be some minor variations in MDL between the tables and the lab certificates, as some samples were analysed by Alcontrols facility at Chester.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 12 :** Sediment Analytical Results - Miscellaneous

Island Area

Sample Type	Soil														
Sample ID	Soil														
Depth (m)	Soil														
Date	Soil														
	SED01	SED02	SED03	SED04	SED05	SED06	SED07	SED08	SED09	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	15-Oct-08	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value									
<b>TOC</b>															
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.5	1.3	1.3	1.5	0.5	0.5	0.3	0.4	1.6
<b>Miscellaneous</b>															
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.03	-	-	-	0.03	0.16	0.12	0.02	0.02
Total Cyanide	mg/kg	2.50	nv	50	1	<b>20</b>	-	-	-	-	-	-	-	-	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	2889	na	na	na	1881	na	na	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	<b>2.1</b>	na	na	na	<b>5</b>	na	na	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	0.145	na	na	na	0.114	na	na	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	- *	na	- *	- *	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	- *	- *	- *	- *	na	na

**xx** Exceeds Human Health Generic Assessment  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs were detected.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 12 :** Sediment Analytical Results - Miscellaneous

Island Area

Sample Type													
Sample ID													
Depth (m)													
Date													
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil SED10	Soil SED11	Soil SED12	Soil SED14	Soil QA12 - Duplicate of SED14	Soil SED15	Soil QA13 - Duplicate of SED15
TOC													
Total Organic Carbon	%	0.2	nv	nv	nv	nv	1.1	1.4	0.9	1	0.8	0.7	0.4
<b>Miscellaneous</b>													
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.04	0.03	-	0.05	0.04	0.04	0.04
Total Cyanide	mg/kg	2.50	nv	50	1	<b>20</b>	-	-	-	-	-	-	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	15	na	na	8515	na	na	na
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	<b>2.2</b>	na	na	<b>1.7</b>	na	na	na
Sulphate	g/l	0.003	nv	nv	nv	nv	0.301	na	na	0.368	na	na	na
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na	na	na

**xx** Exceeds Human Health Generic Assessment  
**xx** Exceeds Controlled Waters Generic  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual SVOCs and VOCs were less than detection limit. No TICs were detected.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 12 :** Sediment Analytical Results - Miscellaneous

Island Area

Sample Type												
Sample ID												
Depth (m)												
Date												
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	Soil SED16 20-Oct-08	Soil SED17 20-Oct-08	Soil QA14 - Duplicate of SED17 UNKNOWN 20-Oct-08	Soil SED18 20-Oct-08	Soil SED21 20-Oct-08	Soil SED 25 0.1 30-Oct-08
<b>TOC</b>												
Total Organic Carbon	%	0.2	nv	nv	nv	nv	4	1	0.6	0.6	0.9	1.4
<b>Miscellaneous</b>												
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	0.17	0.06	0.93	1.63	0.06	-
Total Cyanide	mg/kg	2.50	nv	50	1	<b>20</b>	-	-	-	-	-	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	na	na	na	17214	11811
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	na	na	na	2.8	5.4
Sulphate	g/l	0.003	nv	nv	nv	nv	na	na	na	na	0.656	0.812
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na	na

xx	Exceeds Human Health Generic Assessment
xx	Exceeds Controlled Waters Generic
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value
*	All individual SVOCs and VOCs were less than detection limit. No TICs were detected.

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 12 :** Sediment Analytical Results - Miscellaneous

Mainland Area

Sample Type	Soil											
Sample ID	Soil											
Depth (m)	Soil											
Date	Soil											
	SED13	SED19	SED20	SED22	SED 23	SED 24						
	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	0.1						
	15-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	20-Oct-08	30-Oct-08						
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value						
<b>TOC</b>												
Total Organic Carbon	%	0.2	nv	nv	nv	nv	0.5	14.9	23.3	0.7	1.6	0.4
<b>Miscellaneous</b>												
Total Phenols	mg/kg	0.01	nv	nv	0.05	<b>40</b>	-	-	-	0.06	0.09	0.13
Total Cyanide	mg/kg	2.50	nv	50	1	<b>20</b>	-	-	-	-	-	-
Chloride	mg/kg	5.00	nv	nv	nv	nv	na	na	na	na	na	845
Fluoride	mg/kg	0.50	0.078	36,900	nv	nv	na	na	na	na	na	<b>2</b>
Sulphate	g/l	0.003	nv	nv	nv	nv	na	na	na	na	na	0.049
SVOCs + TICs	ug/kg	100	nv	nv	nv	nv	na	na	na	na	na	na
VOCs + TICs	ug/kg	1	nv	nv	nv	nv	na	na	na	na	na	na

xx	Exceeds Human Health Generic Assessment
xx	Exceeds Controlled Waters Generic
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value
*	All individual SVOCs and VOCs were less than detection limit. No TICs were detected.

Client ESB  
 Project Phase 2 Environmental Investigation  
 Location ESB Tarbert, Co. Kerry  
 Job Number 49341640  
 Table 13: Relative Percentage Difference - Sediment

Sample Type	Sample ID	Depth (m)	Date	Soil		%RPDs	Soil		%RPDs
				SED14	QA12 - Duplicate of SED14		SED15	QA13 - Duplicate of SED15	
Parameters	Units	MDL	UNKNOWN	UNKNOWN		UNKNOWN	UNKNOWN		
			20-Oct-08	20-Oct-08		20-Oct-08	20-Oct-08		
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	mg/kg	0.01	-	-	NC	-	-	-	NC
C7-C8	mg/kg	0.01	-	-	NC	-	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC	-	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC	-	-	-	NC
C12-C16	mg/kg	0.1	1.733	-	NC	-	-	-	NC
C16-C21	mg/kg	0.1	1.095	-	NC	-	-	-	NC
C21-C35	mg/kg	0.1	0.265	-	NC	-	-	-	NC
Total Aromatics	mg/kg	0.1	3.093	-	NC	-	-	-	NC
<b>Aliphatics</b>									
C5-C6	mg/kg	0.01	-	-	NC	-	-	-	NC
C6-C8	mg/kg	0.01	-	-	NC	-	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC	-	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC	-	-	-	NC
C12-C16	mg/kg	0.1	-	-	NC	-	-	-	NC
C16-C21	mg/kg	0.1	-	-	NC	-	-	-	NC
C21-C35	mg/kg	0.1	-	-	NC	-	-	-	NC
Total Aliphatics (MO)	mg/kg	0.1	-	-	NC	-	-	-	NC
Total TPH	mg/kg	0.1	3.093	-	NC	-	-	-	NC
<b>BTEX</b>									
Benzene	mg/kg	0.01	-	-	NC	-	-	-	NC
Toluene	mg/kg	0.01	-	-	NC	-	-	-	NC
Ethylbenzene	mg/kg	0.01	-	-	NC	-	-	-	NC
Total Xylene	mg/kg	0.01	-	-	NC	-	-	-	NC
BTEX	mg/kg	nv	-	-	NC	-	-	-	NC
MTBE	mg/kg	0.01	-	-	NC	-	-	-	NC
<b>TOC</b>									
Total Organic Carbon	%	0.2	1	0.8	22.22	0.7	0.4	54.55	
<b>PAHs</b>									
Naphthalene	ug/kg	1	27	-	NC	-	-	-	NC
Acenaphthylene	ug/kg	1	1	-	NC	-	-	-	NC
Acenaphthene	ug/kg	1	2	-	NC	-	-	-	NC
Fluorene	ug/kg	1	46	-	NC	-	-	-	NC
Phenanthrene	ug/kg	1	670	-	NC	-	-	-	NC
Anthracene	ug/kg	1	52	-	NC	-	-	-	NC
Fluoranthene	ug/kg	1	462	-	NC	-	-	-	NC
Pyrene	ug/kg	1	500	-	NC	-	-	-	NC
Benzo(a)anthracene	ug/kg	1	387	-	NC	-	-	-	NC
Chrysene	ug/kg	1	369	-	NC	-	-	-	NC
Benzo(b)+Benzo(k)fluoranthene	ug/kg	1	339	-	NC	-	-	-	NC
Benzo(a)pyrene	ug/kg	1	90	-	NC	-	-	-	NC
Indeno(123cd)pyrene	ug/kg	1	110	-	NC	-	-	-	NC
Dibenzo(ah)anthracene	ug/kg	1	25	-	NC	-	-	-	NC
Benzo(ghi)perylene	ug/kg	1	130	-	NC	-	-	-	NC
Total 16 EPA PAHs (16)	ug/kg	nv	3209	-	NC	-	-	-	NC
<b>PCBs</b>									
PCB Total of 7 Congeners	ug/kg	1	-	na	NC	na	na	na	NC
<b>Heavy Metals</b>									
Antimony	mg/kg	1.5	-	-	NC	-	-	-	NC
Arsenic	mg/kg	3	6	5	18	13	14	7	
Barium	mg/kg	6	35	40	13.3	24	16	40.0	
Cadmium	mg/kg	0.2	-	-	NC	-	-	-	NC
Chromium	mg/kg	4.5	35	33	5.9	19	36	61.8	
Cobalt	mg/kg	0.4	12	10	18.2	8	10	22	
Copper	mg/kg	6	16	15	6	10	9	11	
Lead	mg/kg	2	18	21	15.4	9	8	11.8	
Mercury	mg/kg	0.4	-	-	NC	-	-	-	NC
Molybdenum	mg/kg	0.6	6	5	18.2	1	1	0.0	
Nickel	mg/kg	0.9	201	166	19.1	33	30	9.5	
Selenium	mg/kg	3	-	-	NC	-	-	-	NC
Vanadium	mg/kg	1.5	569	546	4.1	69	57	19.0	
Zinc	mg/kg	2.5	96	89	7.6	52	50	3.9	
<b>Miscellaneous</b>									
Total Phenols	mg/kg	0.01	0.05	0.04	22.2	0.04	0.04	7.19	
Total Cyanide	mg/kg	2.50	-	-	NC	-	-	-	NC
Chloride	mg/kg	5.00	8515	na	NC	na	na	na	NC
Fluoride	mg/kg	0.50	1.7	na	NC	na	na	na	NC
Sulphate	g/l	0.003	0.368	na	NC	na	na	na	NC
SVOCs	ug/kg	100	na	na	NC	na	na	na	NC
VOCs	ug/kg	1	na	na	NC	na	na	na	NC

nv - No Value  
 "-" - Less than MDL  
 na - Not Analysed  
 NC - Not Calculable  
**Bold** - % RPD greater than 40% and results reported greater than ten times the MDL.

Client ESB  
 Project Phase 2 Environr  
 Location ESB Tarbert, Co.  
 Job Number 49341640  
 Table 13: Relative Percent:

Sample Type			Soil	Soil	%RDPs
Sample ID			SED17	QA14 - Duplicate of SED17	
Depth (m)			UNKNOWN	UNKNOWN	
Date			20-Oct-08	20-Oct-08	
Parameters	Units	MDL			
<b>Hydrocarbons</b>					
<b>Aromatics</b>					
C6-C7	mg/kg	0.01	-	-	NC
C7-C8	mg/kg	0.01	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC
C12-C16	mg/kg	0.1	-	-	NC
C16-C21	mg/kg	0.1	-	-	NC
C21-C35	mg/kg	0.1	-	-	NC
Total Aromatics	mg/kg	0.1	-	-	NC
<b>Aliphatics</b>					
C5-C6	mg/kg	0.01	-	-	NC
C6-C8	mg/kg	0.01	-	-	NC
C8-C10	mg/kg	0.01	-	-	NC
C10-C12	mg/kg	0.01	-	-	NC
C12-C16	mg/kg	0.1	-	-	NC
C16-C21	mg/kg	0.1	-	-	NC
C21-C35	mg/kg	0.1	-	-	NC
Total Aliphatics (MO)	mg/kg	0.1	-	-	NC
Total TPH	mg/kg	0.1	-	-	NC
<b>BTEX</b>					
Benzene	mg/kg	0.01	-	-	NC
Toluene	mg/kg	0.01	-	-	NC
Ethylbenzene	mg/kg	0.01	-	-	NC
Total Xylene	mg/kg	0.01	-	-	NC
BTEX	mg/kg	nv	-	-	NC
MTBE	mg/kg	0.01	-	-	NC
<b>TOC</b>					
Total Organic Carbon	%	0.2	1	0.6	50.00
<b>PAHs</b>					
Naphthalene	ug/kg	1	-	-	NC
Acenaphthylene	ug/kg	1	-	-	NC
Acenaphthene	ug/kg	1	-	-	NC
Fluorene	ug/kg	1	-	-	NC
Phenanthrene	ug/kg	1	-	-	NC
Anthracene	ug/kg	1	-	-	NC
Fluoranthene	ug/kg	1	-	-	NC
Pyrene	ug/kg	1	-	-	NC
Benzo(a)anthracene	ug/kg	1	-	-	NC
Chrysene	ug/kg	1	-	-	NC
Benzo(b)+Benzo(k)fluoranthene	ug/kg	1	-	-	NC
Benzo(a)pyrene	ug/kg	1	-	-	NC
Indeno(123cd)pyrene	ug/kg	1	-	-	NC
Dibenzo(ah)anthracene	ug/kg	1	-	-	NC
Benzo(ghi)perylene	ug/kg	1	-	-	NC
Total 16 EPA PAHs (16)	ug/kg	nv	-	-	NC
<b>PCBs</b>					
PCB Total of 7 Congeners	ug/kg	1	na	na	NC
<b>Heavy Metals</b>					
Antimony	mg/kg	1.5	-	-	NC
Arsenic	mg/kg	3	10	9	11
Barium	mg/kg	6	14	21	40.0
Cadmium	mg/kg	0.2	-	-	NC
Chromium	mg/kg	4.5	28	30	6.9
Cobalt	mg/kg	0.4	12	13	8.0
Copper	mg/kg	6	14	16	13
Lead	mg/kg	2	8	6	28.6
Mercury	mg/kg	0.4	-	-	NC
Molybdenum	mg/kg	0.6	1	-	NC
Nickel	mg/kg	0.9	40	37	7.8
Selenium	mg/kg	3	-	-	NC
Vanadium	mg/kg	1.5	70	61	13.7
Zinc	mg/kg	2.5	72	67	7.2
<b>Miscellaneous</b>					
Total Phenols	mg/kg	0.01	0.06	0.93	175.8
Total Cyanide	mg/kg	2.50	-	-	NC
Chloride	mg/kg	5.00	na	na	NC
Fluoride	mg/kg	0.50	na	na	NC
Sulphate	g/l	0.003	na	na	NC
SVOCs	ug/kg	100	na	na	NC
VOCs	ug/kg	1	na	na	NC

nv - No Value  
 "-" - Less than MDL  
 na - Not Analysed  
 NC - Not Calculable  
**Bold** - % RPD greater than 40% and results r

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 14 :** Asbestos Identification Results - Sediment

Sample Location	Depth Sampled (m)	Material Sampled	Asbestos Detected / Type
SED01	-	Soil	No asbestos detected
SED47	-	Soil	No asbestos detected
SED03	-	Soil	No asbestos detected
SED04	-	Soil	No asbestos detected
SED05	-	Soil	No asbestos detected
SED51	-	Soil	No asbestos detected
SED07	-	Soil	No asbestos detected
SED08	-	Soil	No asbestos detected
SED09	-	Soil	No asbestos detected
SED10	-	Soil	No asbestos detected
SED11	-	Soil	No asbestos detected
SED12	-	Soil	No asbestos detected
SED13	-	Soil	No asbestos detected
SED14	-	Soil	No asbestos detected
SED15	-	Soil	No asbestos detected
SED16	-	Soil	No asbestos detected
SED17	-	Soil	No asbestos detected
SED18	-	Soil	No asbestos detected
SED19	-	Soil	No asbestos detected
SED20	-	Soil	No asbestos detected
SED21	-	Soil	No asbestos detected

Note: Detection limit <0.01 %

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 15:** Groundwater Analytical Results: Hydrocarbons

Island Area

Sample Type											
Sample ID											
Date											
Parameters	UNITS	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater		
				BH 309A	BH 319	BH 311	BH 306	RC 1	MW 101	MW 102B	MW 103
				28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08
<b>Hydrocarbons</b>											
<b>Aromatics</b>											
C6-C7	ug/L	10	nv	-	-	-	-	-	-	-	-
C7-C8	ug/L	10	nv	-	-	-	-	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	-	-	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-	-	-	-	-
Total Aromatics	ug/L	10	nv	-	-	-	-	-	-	-	-
<b>Aliphatics</b>											
C5-C6	ug/L	10	nv	-	-	-	-	-	-	-	-
C6-C8	ug/L	10	nv	-	-	-	-	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	-	-	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-	-	-	-	-
Total Aliphatics (MO)	ug/L	10	nv	-	-	-	-	-	-	-	-
Total TPH	ug/L	10	10	-	-	-	-	-	-	-	-
<b>BTEX</b>											
Benzene	ug/L	10	1	-	-	-	-	-	-	-	-
Toluene	ug/L	10	10	-	-	-	-	-	-	-	-
Ethylbenzene	ug/L	10	10	-	-	-	-	-	-	-	-
Total Xylene	ug/L	10	10	-	-	-	-	-	-	-	-
MTBE	ug/L	10	30	-	-	-	-	-	-	-	-
BTEX	ug/L	10	nv	-	-	-	-	-	-	-	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 MO Mineral Oil  
 NDP No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 15:** Groundwater Analytical Results: Hydrocarbons

Island Area

Sample Type	Groundwater											
Sample ID	Groundwater											
Date	Groundwater											
	RC2	BH317	BH11	BH12	MW301	BH318	BH9	BH314	BH301			
	24-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08	29-Oct-08	29-Oct-08			
Parameters	UNITS	MDL	IGV									
<b>Hydrocarbons</b>												
<b>Aromatics</b>												
C6-C7	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C7-C8	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	nv	-	563	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-	-	-	-	-	-
Total Aromatics	ug/L	10	nv	-	-	-	-	-	563	-	-	-
<b>Aliphatics</b>												
C5-C6	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C6-C8	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-	-	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-	-	-	-	-	-
Total Aliphatics (MO)	ug/L	10	nv	-	-	-	-	-	-	-	-	-
Total TPH	ug/L	10	10	-	-	-	-	-	563	-	-	-
<b>BTEX</b>												
Benzene	ug/L	10	1	-	-	-	-	-	-	-	-	-
Toluene	ug/L	10	10	-	-	-	-	-	-	-	-	-
Ethylbenzene	ug/L	10	10	-	-	-	-	-	-	-	-	-
Total Xylene	ug/L	10	10	-	-	-	-	-	-	-	-	-
MTBE	ug/L	10	30	-	-	-	-	-	-	-	-	-
BTEX	ug/L	10	nv	-	-	-	-	-	-	-	-	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 MO Mineral Oil  
 NDP No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 15:** Groundwater Analytical Results: Hydrocarbons

Mainland Area

Sample Type									
Sample ID									
Date									
Parameters	UNITS	MDL	IGV	Groundwater BH 321 29-Oct-08	Groundwater BH 24 29-Oct-08	Groundwater BH 25 29-Oct-08	Groundwater BH1 24-Oct-08	Groundwater BH5 24-Oct-08	Groundwater MW202 24-Oct-08
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	ug/L	10	nv	-	-	-	-	NDP	-
C7-C8	ug/L	10	nv	-	-	-	-	NDP	-
C8-C10	ug/L	10	nv	-	-	-	-	NDP	-
C10-C12	ug/L	10	nv	-	-	-	-	NDP	-
C12-C16	ug/L	10	nv	-	689	-	-	NDP	-
C16-C21	ug/L	10	nv	-	24	-	-	NDP	-
C21-C35	ug/L	10	nv	-	-	-	-	NDP	-
Total Aromatics	ug/L	10	nv	-	713	-	-	NDP	-
<b>Aliphatics</b>									
C5-C6	ug/L	10	nv	-	-	-	-	NDP	-
C6-C8	ug/L	10	nv	-	-	-	-	NDP	-
C8-C10	ug/L	10	nv	-	-	-	-	NDP	-
C10-C12	ug/L	10	nv	-	-	-	-	NDP	-
C12-C16	ug/L	10	nv	-	-	-	-	NDP	-
C16-C21	ug/L	10	nv	-	-	-	-	NDP	-
C21-C35	ug/L	10	nv	-	-	-	-	NDP	-
Total Aliphatics (MO)	ug/L	10	nv	-	-	-	-	NDP	-
Total TPH	ug/L	10	10	-	713	-	-	NDP	-
<b>BTEX</b>									
Benzene	ug/L	10	1	-	-	-	-	NDP	-
Toluene	ug/L	10	10	-	-	-	-	NDP	-
Ethylbenzene	ug/L	10	10	-	-	-	-	NDP	-
Total Xylene	ug/L	10	10	-	-	-	-	NDP	-
MTBE	ug/L	10	30	-	-	-	-	NDP	-
BTEX	ug/L	10	nv	-	-	-	-	NDP	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 MO Mineral Oil  
 NDP No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 16:** Groundwater Analytical Results: PAHs

Island Area

Sample Type	Groundwater							
Sample ID	BH 309A	BH 319	BH 311	BH 306	RC 1	MW 101	MW 102	MW 103
Date	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08
Parameter	Units	MDL	IGV					
<b>PAHs</b>								
Naphthalene	ug/L	0.01	1	-	-	-	-	-
Acenaphthylene	ug/L	0.01	nv	-	-	-	-	-
Acenaphthene	ug/L	0.01	nv	-	-	-	-	-
Fluorene	ug/L	0.01	nv	-	-	-	-	-
Phenanthrene	ug/L	0.01	nv	-	-	-	-	-
Anthracene	ug/L	0.01	10000	-	-	-	-	-
Fluoranthene**	ug/L	0.01	1	-	-	-	-	-
Pyrene	ug/L	0.01	nv	-	-	-	-	-
Benzo(a)anthracene	ug/L	0.01	nv	-	-	-	-	-
Chrysene	ug/L	0.01	nv	-	-	-	-	-
Benzo(b)+Benzo(k)fluoranthene**	ug/L	0.01	0.05*	-	-	-	-	-
Benzo(a)pyrene**	ug/L	0.01	0.01	-	-	-	-	-
Indeno(123cd)pyrene**	ug/L	0.01	0.05	-	-	-	-	-
Dibenzo(ah)anthracene	ug/L	0.01	nv	-	-	-	-	-
Benzo(ghi)perylene**	ug/L	0.01	0.05	-	-	-	-	-
Sum 6 PAHs	ug/L	-	0.1	-	-	-	-	-
Total 16 EPA PAHs	ug/L	0.01	nv	-	-	-	-	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 \* Laboratory results are presented as a sum of the 2 compounds. Consequently, the lower IGV of 0.05mg/l for benzo(k)fluoranthene is used  
 NDP No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 16:** Groundwater Analytical Results: PAHs

Island Area

Sample Type	Groundwater								
Sample ID	RC2	BH317	BH11	BH12	MW301	BH318	BH9	BH314	BH301
Date	24-Oct-08	29-Oct-08	29-Oct-08						
Parameter	Units	MDL	IGV						
<b>PAHs</b>									
Naphthalene	ug/L	0.01	1	-	-	-	-	0.104	-
Acenaphthylene	ug/L	0.01	nv	-	-	-	-	0.033	-
Acenaphthene	ug/L	0.01	nv	-	-	-	-	0.143	-
Fluorene	ug/L	0.01	nv	-	-	-	-	0.153	-
Phenanthrene	ug/L	0.01	nv	-	-	-	-	0.207	-
Anthracene	ug/L	0.01	10000	-	-	-	-	0.028	-
Fluoranthene**	ug/L	0.01	1	-	-	-	-	-	-
Pyrene	ug/L	0.01	nv	-	-	-	-	-	-
Benzo(a)anthracene	ug/L	0.01	nv	-	-	-	-	-	-
Chrysene	ug/L	0.01	nv	-	-	-	-	-	-
Benzo(b)+Benzo(k)fluoranthene**	ug/L	0.01	0.05*	-	-	-	-	-	-
Benzo(a)pyrene**	ug/L	0.01	0.01	-	-	-	-	-	-
Indeno(123cd)pyrene**	ug/L	0.01	0.05	-	-	-	-	-	-
Dibenzo(ah)anthracene	ug/L	0.01	nv	-	-	-	-	-	-
Benzo(ghi)perylene**	ug/L	0.01	0.05	-	-	-	-	-	-
Sum 6 PAHs	ug/L	-	0.1	-	-	-	-	-	-
Total 16 EPA PAHs	ug/L	0.01	nv	-	-	-	-	0.668	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 \* Laboratory results are presented as a sum of the 2 compounds. Consequently, the lower IGV of 0.05mg/l for benzo(k)fluoranthene is used  
 NDP No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 16:** Groundwater Analytical Results: PAHs

Mainland Area

Sample Type	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater		
Sample ID	BH 321	BH 24	BH 25	BH1	BH5	MW202		
Date	29-Oct-08	29-Oct-08	29-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08		
Parameter	Units	MDL	IGV					
<b>PAHs</b>								
Naphthalene	ug/L	0.01	1	-	0.122	-	NDP	-
Acenaphthylene	ug/L	0.01	nv	-	0.053	-	NDP	-
Acenaphthene	ug/L	0.01	nv	-	0.295	-	NDP	-
Fluorene	ug/L	0.01	nv	-	0.106	-	NDP	-
Phenanthrene	ug/L	0.01	nv	-	0.148	-	NDP	-
Anthracene	ug/L	0.01	10000	-	0.38	-	NDP	-
Fluoranthene**	ug/L	0.01	1	-	0.015	-	NDP	-
Pyrene	ug/L	0.01	nv	-	0.034	-	NDP	-
Benzo(a)anthracene	ug/L	0.01	nv	-	0.013	-	NDP	-
Chrysene	ug/L	0.01	nv	-	0.011	-	NDP	-
Benzo(b)+Benzo(k) fluoranthene**	ug/L	0.01	0.05*	-	-	-	NDP	-
Benzo(a)pyrene**	ug/L	0.01	0.01	-	-	-	NDP	-
Indeno(123cd)pyrene**	ug/L	0.01	0.05	-	-	-	NDP	-
Dibenzo(ah)anthracene	ug/L	0.01	nv	-	-	-	NDP	-
Benzo(ghi)perylene**	ug/L	0.01	0.05	-	-	-	NDP	-
Sum 6 PAHs	ug/L	-	0.1	-	0.015	-	NDP	-
Total 16 EPA PAHs	ug/L	0.01	nv	-	0.835	-	NDP	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 \* Laboratory results are presented as a sum of the 2 compounds. Consequently, the lower IGV of 0.05mg/l for benzo(k)fluoranthene is used  
 NDP No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 17:** Groundwater Analytical Results: Heavy Metals

Island Area

Sample Type	Groundwater												
Sample ID	Groundwater												
Date	Groundwater												
	BH 309A	BH 319	BH 311	BH 306	RC 1	MW 101	MW 102	MW 103					
	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08					
Parameters	UNITS	MDL	IGV										
<b>Metals</b>													
Antimony	mg/L	0.001	nv	-	0.002	-	-	-	-	0.002	-		
Arsenic	mg/L	0.001	0.01	-	0.010	0.003	-	-	0.008	0.021	-		
Barium	mg/L	0.001	0.1	0.003	0.029	0.068	0.008	0.008	0.020	0.094	0.024		
Cadmium	mg/L	0.0004	0.005	-	-	-	-	-	-	-	-		
Chromium	mg/L	0.001	0.03	0.007	0.003	0.008	0.003	0.005	0.007	0.026	0.007		
Cobalt	mg/L	0.001	nv	0.004	-	-	-	-	-	0.006	0.003		
Copper	mg/L	0.001	0.03	0.004	0.004	0.002	0.005	0.004	0.004	0.006	0.004		
Lead	mg/L	0.001	0.01	-	-	-	-	-	-	-	-		
Mercury	mg/L	0.00005	0.001	-	-	-	-	-	-	-	-		
Molybdenum	mg/L	0.001	nv	-	0.036	0.011	-	0.002	0.01	0.002	0.002		
Nickel	mg/L	0.001	0.02	0.002	0.002	0.003	0.002	0.002	0.004	0.005	0.004		
Selenium	mg/L	0.001	nv	-	0.006	0.023	-	-	0.039	0.101	-		
Vanadium	mg/L	0.001	nv	-	0.058	-	0.003	-	0.003	-	-		
Zinc	mg/L	0.001	0.1	0.020	0.016	0.014	0.018	0.018	0.022	0.023	0.021		

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 17:** Groundwater Analytical Results: Heavy Metals

Island Area

Sample Type	Groundwater											
Sample ID	RC2 BH317 BH11 BH12 MW301 BH318 BH9 BH314 BH301											
Date	24-Oct-08 24-Oct-08 24-Oct-08 24-Oct-08 24-Oct-08 24-Oct-08 24-Oct-08 29-Oct-08 29-Oct-08											
Parameters	UNITS	MDL	IGV									
<b>Metals</b>												
Antimony	mg/L	0.001	nv	-	0.003	-	-	-	-	-	-	-
Arsenic	mg/L	0.001	0.01	-	-	-	-	-	-	-	-	-
Barium	mg/L	0.001	0.1	0.037	0.012	0.01	0.005	0.028	0.318	0.542	0.013	0.099
Cadmium	mg/L	0.0004	0.005	-	0.0019	-	-	0.0035	-	-	-	-
Chromium	mg/L	0.001	0.03	0.003	-	-	-	-	0.004	0.003	0.009	0.007
Cobalt	mg/L	0.001	nv	0.078	0.026	0.011	0.002	0.012	-	0.002	0.002	-
Copper	mg/L	0.001	0.03	0.001	0.009	0.004	-	0.001	-	0.001	-	-
Lead	mg/L	0.001	0.01	-	0.001	-	-	-	-	-	-	-
Mercury	mg/L	0.00005	0.001	-	-	-	-	-	-	-	-	-
Molybdenum	mg/L	0.001	nv	-	-	-	-	-	0.002	0.001	0.014	0.01
Nickel	mg/L	0.001	0.02	0.065	0.012	0.006	0.007	0.012	0.003	0.003	-	-
Selenium	mg/L	0.001	nv	-	0.002	-	-	-	0.019	0.004	-	-
Vanadium	mg/L	0.001	nv	0.006	0.004	0.001	0.003	0.007	0.012	0.009	0.544	-
Zinc	mg/L	0.001	0.1	0.013	0.002	0.011	0.019	0.011	0.017	0.004	0.014	0.016

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 17:** Groundwater Analytical Results: Heavy Metals

Mainland Area

Sample Type	Groundwater					
Sample ID	BH 321	BH 24	BH 25	BH1	BH5	MW202
Date	29-Oct-08	29-Oct-08	29-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08
Parameters	UNITS	MDL	IGV			
<b>Metals</b>						
Antimony	mg/L	0.001	nv	-	0.001	0.001
Arsenic	mg/L	0.001	0.01	0.01	0.002	-
Barium	mg/L	0.001	0.1	0.147	0.003	0.047
Cadmium	mg/L	0.0004	0.005	-	-	-
Chromium	mg/L	0.001	0.03	0.006	0.003	0.003
Cobalt	mg/L	0.001	nv	0.004	0.005	-
Copper	mg/L	0.001	0.03	0.002	0.002	0.001
Lead	mg/L	0.001	0.01	-	-	0.001
Mercury	mg/L	0.00005	0.001	-	-	-
Molybdenum	mg/L	0.001	nv	0.002	-	0.009
Nickel	mg/L	0.001	0.02	0.004	0.002	0.013
Selenium	mg/L	0.001	nv	0.046	0.004	0.002
Vanadium	mg/L	0.001	nv	-	-	0.981
Zinc	mg/L	0.001	0.1	0.019	0.013	0.015

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 18: Groundwater Analytical Results: Various

Island Area

Sample Type	Groundwater										
Sample ID	BH 309A	BH 319	BH 311	BH 306	RC 1	MW 101	MW 102	MW 103			
Date	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08			
Parameter	Units	MDL	IGV								
<b>Anions and Cations</b>											
Aluminium	mg/L	0.002	0.2	0.002	-	-	0.124	-	-	-	-
Boron	mg/L	0.003	1	0.057	0.542	1.045	0.031	0.082	1.928	3.298	0.234
Calcium	mg/L	0.12	200	26.68	82.320	104.500	39.760	75.920	129.500	226.400	72.99
Chloride	mg/L	1	30	43	1736	4636	56	467	6961	16956	292
Fluoride	mg/L	0.1	1	0.4	1	0.7	0.3	0.3	0.8	1.8	0.4
Iron	mg/L	0.002	0.2	3.197	0.038	0.008	0.273	-	-	0.062	-
Potassium (Total as K)	mg/L	0.2	5	7.5	49.9	93.8	6.8	7.8	154.2	248.8	9.6
Managanese	mg/L	0.001	0.05	12.38	1.270	0.611	0.672	1.273	0.623	8.416	17.52
Sodium (Total as Na)	mg/L	0.2	150	53.2	980.6	2692	49.6	205.2	4062	7161	230.7
Sulphate	mg/L	3	200	-	179	637	29	43	748	-	-
Alkalinity as CaCO <sub>3</sub>	mg/L	1	nv	220	383	380	160	180	560	2260	500
Total Hardness as CaCO <sub>3</sub>	mg/L	1	200	125	577	1159	143	323	1609	3528	326
Total Dissolved Solids (TDS)	mg/L	5	1000	240	2990	8970	601	910	11800	22700	797
<b>Nutrients</b>											
Ammonia*	mg/L	0.257	0.15	-	3.472	8.745	0.257	0.386	3.472	100.308	5.401
Nitrate (as NO <sub>3</sub> )	mg/L	0.3	25	-	-	-	1.2	0.4	-	-	1.1
Nitrite (as NO <sub>2</sub> )	mg/L	0.05	0.1	-	0.27	0.06	0.09	0.15	0.24	-	2.15
Phosphate	mg/L	0.03	0.03	0.12	-	-	-	-	0.52	3.27	-
<b>Miscellaneous</b>											
Electrical Conductivity	mS/cm	0.014	1	0.505	2.676	14	0.513	1.675	20	36	1.668
pH	pH Units	nv	>6.5 - <9.5	6.68	7.86	7.54	7.12	7.5	7.68	7.58	7.16
Temperature**	° Celcius	nv	25°C	na	na	na	na	na	na	na	na
Redox Potential**	mV	nv	nv	150	18	180	200	160	170	170	170
Total Phenols	mg/L	0.01	0.0005	0.08	0.08	0.08	0.08	0.08	0.08	0.05	0.08
Total Cyanide	mg/L	0.05	0.01	-	-	-	-	-	-	-	-

IGV Interim Guideline Value for Groundwater  
 xx Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 \* Conversion factor of 1.286 used to convert ammoniacial nitrogen (as N) to ammonia (as ammonium as NH<sub>4</sub>)  
 \*\* Measured in the field

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 18:** Groundwater Analytical Results: Various

Island Area

Sample Type	Groundwater											
Sample ID	Groundwater											
Date	Groundwater											
Parameter	Units	MDL	IGV	RC2	BH317	BH11	BH12	MW301	BH318	BH9	BH314	BH301
				24-Oct-08	29-Oct-08	29-Oct-08						
<b>Anions and Cations</b>												
Aluminium	mg/L	0.002	0.2	0.003	0.144	na	0.025	-	na	-	-	0.048
Boron	mg/L	0.003	1	0.087	0.028	na	0.049	0.031	na	0.072	0.022	0.006
Calcium	mg/L	0.12	200	99.01	16.33	na	18.2	151.4	na	76.43	34.41	8.889
Chloride	mg/L	1	30	565	137	na	179	103	na	1.643	14	57
Fluoride	mg/L	0.1	1	0.5	0.4	na	0.2	-	na	0.6	0.3	4.7
Iron	mg/L	0.002	0.2	-	0.017	na	-	-	na	-	0.023	0.104
Potassium (Total as K)	mg/L	0.2	5	10.1	4	na	1	5.3	na	52.1	3.2	3.2
Managanese	mg/L	0.001	0.05	2.507	2.39	na	3.939	3.921	na	3.602	0.098	0.347
Sodium (Total as Na)	mg/L	0.2	150	261.9	105.5	na	147.8	234.8	na	934.9	31.3	105.1
Sulphate	mg/L	3	200	13	26	na	55	963	na	24	47	28
Alkalinity as CaCO <sub>3</sub>	mg/L	1	nv	340	190	na	150	150	na	510	150	130
Total Hardness as CaCO <sub>3</sub>	mg/L	1	200	411	119	na	100	699	na	453	138	33
Total Dissolved Solids (TDS)	mg/L	5	1000	6980	2780	na	382	128	na	408	185	255
<b>Nutrients</b>												
Ammonia*	mg/L	0.257	0.15	2.186	4.372	6.301	12.474	98.379	23.277	8.102	-	1.929
Nitrate (as NO <sub>3</sub> )	mg/L	0.3	25	-	-	0.9	-	-	-	-	1	0.3
Nitrite (as NO <sub>2</sub> )	mg/L	0.05	0.1	-	-	-	-	-	-	0.19	-	-
Phosphate	mg/L	0.03	0.03	-	-	0.03	0.07	-	0.03	-	0.08	0.09
<b>Miscellaneous</b>												
Electrical Conductivity	mS/cm	0.014	1	2.092	0.771	0.464	0.9	2.111	13	5	0.39	0.514
pH	pH Units	nv	>6.5 - <9.5	6.53	6.13	6.5	6.18	6.48	6.82	7.03	7.7	7.97
Temperature**	° Celcius	nv	25°C	13.03	13.25	12.23	11.54	11.77	13.03	12.76	na	na
Redox Potential**	mV	nv	nv	150	150	140	140	140	0	160	120	130
Total Phenols	mg/L	0.01	0.0005	-	0.02	0.04	0.02	0.01	0.01	0.02	0.07	0.09
Total Cyanide	mg/L	0.05	0.01	-	-	-	-	-	-	-	-	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 \* Conversion factor of 1.286 used to convert ammoniacial nitrogen (as N) to ammonia (as ammonium as NH4)  
 \*\* Measured in the field

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 18:** Groundwater Analytical Results: Various

Mainland Area

Sample Type	Groundwater								
Sample ID	BH 321	BH 24	BH 25	BH1	BH5	MW202			
Date	29-Oct-08	29-Oct-08	29-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08			
Parameter	Units	MDL	IGV						
<b>Anions and Cations</b>									
Aluminium	mg/L	0.002	0.2	-	0.033	na	0.019	2.75	0.05
Boron	mg/L	0.003	1	1.242	0.044	na	0.076	0.048	0.039
Calcium	mg/L	0.12	200	153.8	35.47	na	29.18	74.22	27.66
Chloride	mg/L	1	30	5475	82	na	45	36	155
Fluoride	mg/L	0.1	1	0.9	-	na	0.3	0.4	0.3
Iron	mg/L	0.002	0.2	-	0.884	na	0.038	1.324	-
Potassium (Total as K)	mg/L	0.2	5	120	3.7	na	2.8	5.2	4
Managanese	mg/L	0.001	0.05	11.92	8.314	na	1.084	0.15	2.023
Sodium (Total as Na)	mg/L	0.2	150	3254	47.2	na	39.8	42	88.6
Sulphate	mg/L	3	200	665	7	na	10	17	92
Alkalinity as CaCO <sub>3</sub>	mg/L	1	nv	150	150	na	140	310	130
Total Hardness as CaCO <sub>3</sub>	mg/L	1	200	1655	136	na	114	282	182
Total Dissolved Solids (TDS)	mg/L	5	1000	9980	254	na	216	23300	205
<b>Nutrients</b>									
Ammonia*	mg/L	0.257	0.15	1.800	1.415	-	5.530	na	1.029
Nitrate (as NO <sub>3</sub> )	mg/L	0.3	25	-	-	4.8	2.8	na	-
Nitrite (as NO <sub>2</sub> )	mg/L	0.05	0.1	-	0.07	0.06	1.01	na	-
Phosphate	mg/L	0.03	0.03	0.03	-	-	0.06	na	0.04
<b>Miscellaneous</b>									
Electrical Conductivity	mS/cm	0.014	1	15.5	0.529	0.479	0.402	0.68	0.805
pH	pH Units	nv	>6.5 - <9.5	6.74	6.77	7.01	7.25	7.82	6.37
Temperature**	° Celcius	nv	25°C	na	na	na	10.61	11.32	11.69
Redox Potential**	mV	nv	nv	170	150	140	140	130	150
Total Phenols	mg/L	0.01	0.0005	0.08	0.07	0.07	-	0.02	0.01
Total Cyanide	mg/L	0.05	0.01	-	-	-	-	-	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 \* Conversion factor of 1.286 used to convert ammoniacial nitrogen (as N) to ammonia (as ammonium as NH4)  
 \*\* Measured in the field

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 19: Groundwater Analytical Results: VOCs

Island Area

Sample Type	Sample ID	Date	Parameters	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
							BH 309A	BH 319	BH 311	BH 306	RC 1	MW 101
							28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08
Dichlorodifluoromethane				ug/l	3.0	nv	-	-	-	-	-	-
Chloromethane				ug/l	1.0	nv	-	-	-	-	-	-
Vinyl Chloride				ug/l	3.0	nv	-	-	-	-	-	-
Bromomethane				ug/l	3.0	nv	-	-	-	-	-	-
Chloroethane				ug/l	2.0	nv	-	-	-	-	-	-
Trichlorofluoromethane				ug/l	1.0	nv	-	-	-	-	-	-
1,1-Dichloroethene				ug/l	2.0	nv	-	-	-	-	-	-
Carbon Disulphide				ug/l	1.0	nv	-	-	-	-	-	-
Dichloromethane				ug/l	2.0	10	-	-	-	-	-	-
Tert-butyl methyl ether				ug/l	1.0	30	-	-	-	-	-	-
Trans-1,2-Dichloroethene				ug/l	2.0	nv	-	-	-	-	-	-
1,1-Dichloroethane				ug/l	1.0	nv	-	-	-	-	-	-
Cis-1,2-Dichloroethene				ug/l	2.0	nv	-	-	-	-	-	-
2,2-Dichloropropane				ug/l	2.0	nv	-	-	-	-	-	-
Bromochloromethane				ug/l	2.0	nv	-	-	-	-	-	-
Chloroform				ug/l	1.0	12	-	-	-	-	-	-
1,1,1-Trichloroethane				ug/l	2.0	500	-	-	-	-	-	-
1,1-Dichloropropene				ug/l	2.0	nv	-	-	-	-	-	-
Carbontetrachloride				ug/l	1.0	nv	-	-	-	-	-	-
1,2-Dichloroethane				ug/l	2.0	3	-	-	-	-	-	-
Benzene				ug/l	1.0	1	-	-	-	-	-	-
Trichloroethene				ug/l	1.5	70	-	-	-	-	-	-
1,2-Dichloropropane				ug/l	2.0	nv	-	-	-	-	-	-
Dibromomethane				ug/l	3.0	nv	-	-	-	-	-	-
Bromodichloromethane				ug/l	3.0	nv	-	-	-	-	-	-
Cis-1,3-Dichloropropene				ug/l	1.0	nv	-	-	-	-	-	-
Toluene				ug/l	1.0	10	-	-	-	-	-	-
Trans-1,3-Dichloropropene				ug/l	2.0	nv	-	-	-	-	-	-
1,1,2-Trichloroethane				ug/l	3.0	nv	-	-	-	-	-	-
1,3-Dichloropropane				ug/l	2.0	nv	-	-	-	-	-	-
Tetrachloroethene				ug/l	0.4	40	-	-	-	-	-	-
Dibromochloromethane				ug/l	3.0	nv	-	-	-	-	-	-
1,2-Dibromoethane				ug/l	2.5	nv	-	-	-	-	-	-
Chlorobenzene				ug/l	1.0	1	-	-	-	-	-	-
1,1,1,2-tetrachloroethane				ug/l	1.0	nv	-	-	-	-	-	-
Ethylbenzene				ug/l	1.0	10	-	-	-	-	-	-
p/m-Xylene				ug/l	1.0	10	-	-	-	-	-	-
o-Xylene				ug/l	1.5	10	-	-	-	-	-	-
Styrene				ug/l	1.0	nv	-	-	-	-	-	-
Bromoform				ug/l	3.0	nv	-	-	-	-	-	-
Isopropylbenzene				ug/l	1.0	nv	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane				ug/l	3.0	nv	-	-	-	-	-	-
1,2,3-Trichloropropane				ug/l	2.0	nv	-	-	-	-	-	-
Bromobenzene				ug/l	1.0	nv	-	-	-	-	-	-
Propylbenzene				ug/l	1.0	nv	-	-	-	-	-	-
2-Chlorotoluene				ug/l	2.0	nv	-	-	-	-	-	-
1,3,5-Trimethylbenzene				ug/l	1.0	nv	-	-	-	-	-	-
4-Chlorotoluene				ug/l	1.0	nv	-	-	-	-	-	-
Tert-Butylbenzene				ug/l	1.0	nv	-	-	-	-	-	-
1,2,4-Trimethylbenzene				ug/l	1.5	nv	-	-	-	-	-	-
Sec-Butylbenzene				ug/l	1.0	nv	-	-	-	-	-	-
4-Isopropyltoluene				ug/l	1.0	nv	-	-	-	-	-	-
1,3-Dichlorobenzene				ug/l	2.0	nv	-	-	-	-	-	-
1,4-Dichlorobenzene				ug/l	3.0	nv	-	-	-	-	-	-
n-Butylbenzene				ug/l	1.0	nv	-	-	-	-	-	-
1,2-Dichlorobenzene				ug/l	2.0	10	-	-	-	-	-	-
1,2-Dibromo-3-Chloropropan				ug/l	5.0	nv	-	-	-	-	-	-
1,2,4-Trichlorobenzene				ug/l	4.0	0.4	-	-	-	-	-	-
Hexachlorobutadiene				ug/l	1.0	0.1	-	-	-	-	-	-
Naphthalene				ug/l	2.0	1	-	-	-	-	-	-
1,2,3-Trichlorobenzene				ug/l	2.0	nv	-	-	-	-	-	-
VOC TICs				ug/l	nv	nv	nd	nd	nd	nd	nd	nd

IGV Interim Guideline Value for Groundwater  
 xx Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 nd Not Detected  
 \* MDL <1 ug/l

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 19: Groundwater Analytical Results: VOCs

Island Area

Sample Type	Sample ID	Date	Parameters	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
							MW 102	MW 103	RC2	BH317	BH11	BH12
							28-Oct-08	28-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08
Dichlorodifluoromethane			ug/l	3.0		nv	-	-	.*	.*	.*	.*
Chloromethane			ug/l	1.0		nv	-	-	.*	.*	.*	.*
Vinyl Chloride			ug/l	3.0		nv	-	-	.*	.*	.*	.*
Bromomethane			ug/l	3.0		nv	-	-	.*	.*	.*	.*
Chloroethane			ug/l	2.0		nv	-	-	.*	.*	.*	.*
Trichlorofluoromethane			ug/l	1.0		nv	-	-	.*	.*	.*	.*
1,1-Dichloroethene			ug/l	2.0		nv	-	-	.*	.*	.*	.*
Carbon Disulphide			ug/l	1.0		nv	-	-	.*	.*	.*	.*
Dichloromethane			ug/l	2.0		10	-	-	.*	.*	.*	.*
Tert-butyl methyl ether			ug/l	1.0		30	-	-	.*	.*	.*	.*
Trans-1,2-Dichloroethene			ug/l	2.0		nv	-	-	.*	.*	.*	.*
1,1-Dichloroethane			ug/l	1.0		nv	-	-	.*	.*	.*	.*
Cis-1,2-Dichloroethene			ug/l	2.0		nv	-	-	.*	.*	.*	.*
2,2-Dichloropropane			ug/l	2.0		nv	-	-	.*	.*	.*	.*
Bromochloromethane			ug/l	2.0		nv	-	-	.*	.*	.*	.*
Chloroform			ug/l	1.0		12	-	-	.*	.*	.*	.*
1,1,1-Trichloroethane			ug/l	2.0		500	-	-	.*	.*	.*	.*
1,1-Dichloropropene			ug/l	2.0		nv	-	-	.*	.*	.*	.*
Carbontetrachloride			ug/l	1.0		nv	-	-	.*	.*	.*	.*
1,2-Dichloroethane			ug/l	2.0		3	-	-	.*	.*	.*	.*
Benzene			ug/l	1.0		1	-	-	.*	.*	.*	.*
Trichloroethene			ug/l	1.5		70	-	-	.*	.*	.*	.*
1,2-Dichloropropane			ug/l	2.0		nv	-	-	.*	.*	.*	.*
Dibromomethane			ug/l	3.0		nv	-	-	.*	.*	.*	.*
Bromodichloromethane			ug/l	3.0		nv	-	-	.*	.*	.*	.*
Cis-1,3-Dichloropropene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
Toluene			ug/l	1.0		10	-	-	.*	.*	.*	.*
Trans-1,3-Dichloropropene			ug/l	2.0		nv	-	-	.*	.*	.*	.*
1,1,2-Trichloroethane			ug/l	3.0		nv	-	-	.*	.*	.*	.*
1,3-Dichloropropane			ug/l	2.0		nv	-	-	.*	.*	.*	.*
Tetrachloroethene			ug/l	0.4		40	-	-	.*	.*	.*	.*
Dibromochloromethane			ug/l	3.0		nv	-	-	.*	.*	.*	.*
1,2-Dibromoethane			ug/l	2.5		nv	-	-	.*	.*	.*	.*
Chlorobenzene			ug/l	1.0		1	-	-	.*	.*	.*	.*
1,1,1,2-tetrachloroethane			ug/l	1.0		nv	-	-	.*	.*	.*	.*
Ethylbenzene			ug/l	1.0		10	-	-	.*	.*	.*	.*
p/m-Xylene			ug/l	1.0		10	-	-	.*	.*	.*	.*
o-Xylene			ug/l	1.5		10	-	-	.*	.*	.*	.*
Styrene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
Bromoform			ug/l	3.0		nv	-	-	.*	.*	.*	.*
Isopropylbenzene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
1,1,2,2-Tetrachloroethane			ug/l	3.0		nv	-	-	.*	.*	.*	.*
1,2,3-Trichloropropane			ug/l	2.0		nv	-	-	.*	.*	.*	.*
Bromobenzene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
Propylbenzene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
2-Chlorotoluene			ug/l	2.0		nv	-	-	.*	.*	.*	.*
1,3,5-Trimethylbenzene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
4-Chlorotoluene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
Tert-Butylbenzene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
1,2,4-Trimethylbenzene			ug/l	1.5		nv	-	-	.*	.*	.*	.*
Sec-Butylbenzene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
4-Isopropyltoluene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
1,3-Dichlorobenzene			ug/l	2.0		nv	-	-	.*	.*	.*	.*
1,4-Dichlorobenzene			ug/l	3.0		nv	-	-	.*	.*	.*	.*
n-Butylbenzene			ug/l	1.0		nv	-	-	.*	.*	.*	.*
1,2-Dichlorobenzene			ug/l	2.0		10	-	-	.*	.*	.*	.*
1,2-Dibromo-3-Chloropropan			ug/l	5.0		nv	-	-	.*	.*	.*	.*
1,2,4-Trichlorobenzene			ug/l	4.0		0.4	-	-	.*	.*	.*	.*
Hexachlorobutadiene			ug/l	1.0		0.1	-	-	.*	.*	.*	.*
Naphthalene			ug/l	2.0		1	-	-	.*	.*	.*	.*
1,2,3-Trichlorobenzene			ug/l	2.0		nv	-	-	.*	.*	.*	.*
VOC TICs			ug/l	nv		nv	nd	nd	nd	nd	nd	nd

IGV Interim Guideline Value for Groundwater  
 xx Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 nd Not Detected  
 \* MDL <1 ug/l

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 19: Groundwater Analytical Results: VOCs

Island Area

Sample Type	Sample ID	Date	Parameters	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
							MW301	BH318	BH9	BH314	BH301
							24-Oct-08	24-Oct-08	24-Oct-08	29-Oct-08	29-Oct-08
Dichlorodifluoromethane	ug/l	3.0	nv	-*	-*	-*	-*	-*			
Chloromethane	ug/l	1.0	nv	-*	-*	-*	-*	-*			
Vinyl Chloride	ug/l	3.0	nv	-*	-*	-*	-*	-*			
Bromomethane	ug/l	3.0	nv	-*	-*	-*	-*	-*			
Chloroethane	ug/l	2.0	nv	-*	-*	-*	-*	-*			
Trichlorofluoromethane	ug/l	1.0	nv	-*	-*	-*	-*	-*			
1,1-Dichloroethene	ug/l	2.0	nv	-*	-*	-*	-*	-*			
Carbon Disulphide	ug/l	1.0	nv	-*	-*	-*	-*	-*			
Dichloromethane	ug/l	2.0	10	-*	-*	-*	-*	-*			
Tert-butyl methyl ether	ug/l	1.0	30	-*	-*	-*	-*	-*			
Trans-1,2-Dichloroethene	ug/l	2.0	nv	-*	-*	-*	-*	-*			
1,1-Dichloroethane	ug/l	1.0	nv	-*	-*	-*	-*	-*			
Cis-1,2-Dichloroethene	ug/l	2.0	nv	-*	-*	-*	-*	-*			
2,2-Dichloropropane	ug/l	2.0	nv	-*	-*	-*	-*	-*			
Bromochloromethane	ug/l	2.0	nv	-*	-*	-*	-*	-*			
Chloroform	ug/l	1.0	12	-*	-*	-*	-*	-*			
1,1,1-Trichloroethane	ug/l	2.0	500	-*	-*	-*	-*	-*			
1,1-Dichloropropene	ug/l	2.0	nv	-*	-*	-*	-*	-*			
Carbontetrachloride	ug/l	1.0	nv	-*	-*	-*	-*	-*			
1,2-Dichloroethane	ug/l	2.0	3	-*	-*	-*	-*	-*			
Benzene	ug/l	1.0	1	-*	-*	-*	-*	-*			
Trichloroethene	ug/l	1.5	70	-*	-*	-*	-*	-*			
1,2-Dichloropropane	ug/l	2.0	nv	-*	-*	-*	-*	-*			
Dibromomethane	ug/l	3.0	nv	-*	-*	-*	-*	-*			
Bromodichloromethane	ug/l	3.0	nv	-*	-*	-*	-*	-*			
Cis-1,3-Dichloropropene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
Toluene	ug/l	1.0	10	-*	-*	-*	-*	-*			
Trans-1,3-Dichloropropene	ug/l	2.0	nv	-*	-*	-*	-*	-*			
1,1,2-Trichloroethane	ug/l	3.0	nv	-*	-*	-*	-*	-*			
1,3-Dichloropropane	ug/l	2.0	nv	-*	-*	-*	-*	-*			
Tetrachloroethene	ug/l	0.4	40	-*	-*	-*	-*	-*			
Dibromochloromethane	ug/l	3.0	nv	-*	-*	-*	-*	-*			
1,2-Dibromoethane	ug/l	2.5	nv	-*	-*	-*	-*	-*			
Chlorobenzene	ug/l	1.0	1	-*	-*	-*	-*	-*			
1,1,1,2-tetrachloroethane	ug/l	1.0	nv	-*	-*	-*	-*	-*			
Ethylbenzene	ug/l	1.0	10	-*	-*	-*	-*	-*			
p/m-Xylene	ug/l	1.0	10	-*	-*	-*	-*	-*			
o-Xylene	ug/l	1.5	10	-*	-*	-*	-*	-*			
Styrene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
Bromoform	ug/l	3.0	nv	-*	-*	-*	-*	-*			
Isopropylbenzene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
1,1,2,2-Tetrachloroethane	ug/l	3.0	nv	-*	-*	-*	-*	-*			
1,2,3-Trichloropropane	ug/l	2.0	nv	-*	-*	-*	-*	-*			
Bromobenzene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
Propylbenzene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
2-Chlorotoluene	ug/l	2.0	nv	-*	-*	-*	-*	-*			
1,3,5-Trimethylbenzene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
4-Chlorotoluene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
Tert-Butylbenzene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
1,2,4-Trimethylbenzene	ug/l	1.5	nv	-*	-*	-*	-*	-*			
Sec-Butylbenzene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
4-Isopropyltoluene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
1,3-Dichlorobenzene	ug/l	2.0	nv	-*	-*	-*	-*	-*			
1,4-Dichlorobenzene	ug/l	3.0	nv	-*	-*	-*	-*	-*			
n-Butylbenzene	ug/l	1.0	nv	-*	-*	-*	-*	-*			
1,2-Dichlorobenzene	ug/l	2.0	10	-*	-*	-*	-*	-*			
1,2-Dibromo-3-Chloropropan	ug/l	5.0	nv	-*	-*	-*	-*	-*			
1,2,4-Trichlorobenzene	ug/l	4.0	0.4	-*	-*	-*	-*	-*			
Hexachlorobutadiene	ug/l	1.0	0.1	-*	-*	-*	-*	-*			
Naphthalene	ug/l	2.0	1	-*	-*	-*	-*	-*			
1,2,3-Trichlorobenzene	ug/l	2.0	nv	-*	-*	-*	-*	-*			
VOC TICs	ug/l	nv	nv	nd	nd	nd	nd	nd			

IGV Interim Guideline Value for Groundwater  
 xx Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 nd Not Detected  
 \* MDL <1 ug/l

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 19: Groundwater Analytical Results: VOCs

Mainland Area

Sample Type	Sample ID	Date	Parameters	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
							BH 321	BH 24	BH 25	BH1	BH5	MW202
							29-Oct-08	29-Oct-08	29-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08
Dichlorodifluoromethane				ug/l	3.0	nv	-	-	-	.*	.*	.*
Chloromethane				ug/l	1.0	nv	-	-	-	.*	.*	.*
Vinyl Chloride				ug/l	3.0	nv	-	-	-	.*	.*	.*
Bromomethane				ug/l	3.0	nv	-	-	-	.*	.*	.*
Chloroethane				ug/l	2.0	nv	-	-	-	.*	.*	.*
Trichlorofluoromethane				ug/l	1.0	nv	-	-	-	.*	.*	.*
1,1-Dichloroethene				ug/l	2.0	nv	-	-	-	.*	.*	.*
Carbon Disulphide				ug/l	1.0	nv	-	-	-	.*	.*	.*
Dichloromethane				ug/l	2.0	10	-	-	-	.*	.*	.*
Tert-butyl methyl ether				ug/l	1.0	30	-	-	-	.*	.*	.*
Trans-1,2-Dichloroethene				ug/l	2.0	nv	-	-	-	.*	.*	.*
1,1-Dichloroethane				ug/l	1.0	nv	-	-	-	.*	.*	.*
Cis-1,2-Dichloroethene				ug/l	2.0	nv	-	-	-	.*	.*	.*
2,2-Dichloropropane				ug/l	2.0	nv	-	-	-	.*	.*	.*
Bromochloromethane				ug/l	2.0	nv	-	-	-	.*	.*	.*
Chloroform				ug/l	1.0	12	-	-	-	.*	.*	.*
1,1,1-Trichloroethane				ug/l	2.0	500	-	-	-	.*	.*	.*
1,1-Dichloropropene				ug/l	2.0	nv	-	-	-	.*	.*	.*
Carbontetrachloride				ug/l	1.0	nv	-	-	-	.*	.*	.*
1,2-Dichloroethane				ug/l	2.0	3	-	-	-	.*	.*	.*
Benzene				ug/l	1.0	1	-	-	-	.*	.*	.*
Trichloroethene				ug/l	1.5	70	-	-	-	.*	.*	.*
1,2-Dichloropropane				ug/l	2.0	nv	-	-	-	.*	.*	.*
Dibromomethane				ug/l	3.0	nv	-	-	-	.*	.*	.*
Bromodichloromethane				ug/l	3.0	nv	-	-	-	.*	.*	.*
Cis-1,3-Dichloropropene				ug/l	1.0	nv	-	-	-	.*	.*	.*
Toluene				ug/l	1.0	10	-	-	-	.*	.*	.*
Trans-1,3-Dichloropropene				ug/l	2.0	nv	-	-	-	.*	.*	.*
1,1,2-Trichloroethane				ug/l	3.0	nv	-	-	-	.*	.*	.*
1,3-Dichloropropane				ug/l	2.0	nv	-	-	-	.*	.*	.*
Tetrachloroethene				ug/l	0.4	40	-	-	-	.*	.*	.*
Dibromochloromethane				ug/l	3.0	nv	-	-	-	.*	.*	.*
1,2-Dibromoethane				ug/l	2.5	nv	-	-	-	.*	.*	.*
Chlorobenzene				ug/l	1.0	1	-	-	-	.*	.*	.*
1,1,1,2-tetrachloroethane				ug/l	1.0	nv	-	-	-	.*	.*	.*
Ethylbenzene				ug/l	1.0	10	-	-	-	.*	.*	.*
p/m-Xylene				ug/l	1.0	10	-	-	-	.*	.*	.*
o-Xylene				ug/l	1.5	10	-	-	-	.*	.*	.*
Styrene				ug/l	1.0	nv	-	-	-	.*	.*	.*
Bromoform				ug/l	3.0	nv	-	-	-	.*	.*	.*
Isopropylbenzene				ug/l	1.0	nv	-	-	-	.*	.*	.*
1,1,2,2-Tetrachloroethane				ug/l	3.0	nv	-	-	-	.*	.*	.*
1,2,3-Trichloropropane				ug/l	2.0	nv	-	-	-	.*	.*	.*
Bromobenzene				ug/l	1.0	nv	-	-	-	.*	.*	.*
Propylbenzene				ug/l	1.0	nv	-	-	-	.*	.*	.*
2-Chlorotoluene				ug/l	2.0	nv	-	-	-	.*	.*	.*
1,3,5-Trimethylbenzene				ug/l	1.0	nv	-	-	-	.*	.*	.*
4-Chlorotoluene				ug/l	1.0	nv	-	-	-	.*	.*	.*
Tert-Butylbenzene				ug/l	1.0	nv	-	-	-	.*	.*	.*
1,2,4-Trimethylbenzene				ug/l	1.5	nv	-	-	-	.*	.*	.*
Sec-Butylbenzene				ug/l	1.0	nv	-	-	-	.*	.*	.*
4-Isopropyltoluene				ug/l	1.0	nv	-	-	-	.*	.*	.*
1,3-Dichlorobenzene				ug/l	2.0	nv	-	-	-	.*	.*	.*
1,4-Dichlorobenzene				ug/l	3.0	nv	-	-	-	.*	.*	.*
n-Butylbenzene				ug/l	1.0	nv	-	-	-	.*	.*	.*
1,2-Dichlorobenzene				ug/l	2.0	10	-	-	-	.*	.*	.*
1,2-Dibromo-3-Chloropropan				ug/l	5.0	nv	-	-	-	.*	.*	.*
1,2,4-Trichlorobenzene				ug/l	4.0	0.4	-	-	-	.*	.*	.*
Hexachlorobutadiene				ug/l	1.0	0.1	-	-	-	.*	.*	.*
Naphthalene				ug/l	2.0	1	-	-	-	.*	.*	.*
1,2,3-Trichlorobenzene				ug/l	2.0	nv	-	-	-	.*	.*	.*
VOC TICs				ug/l	nv	nv	nd	nd	nd	nd	nd	nd

IGV Interim Guideline Value for Groundwater  
 xx Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 nd Not Detected  
 \* MDL <1 ug/l

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 20: Groundwater Analytical Results: SVOCs

Island Area

Sample Type	Sample ID	Date	Parameters	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
							BH 309A	BH 319	BH 311	BH 306	RC 1	MW 101
							28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08
Phenol				ug/l	1	0.5	-	-	-	-	-	-
2-Chlorophenol				ug/l	1	200	-	-	-	-	-	-
2-Methylphenol				ug/l	1	nv	-	-	-	-	-	-
4-Methylphenol				ug/l	1	nv	-	-	-	-	-	-
2-Nitrophenol				ug/l	1	nv	-	-	-	-	-	-
4-Nitrophenol				ug/l	1	nv	-	-	-	-	-	-
2,4-Dichlorophenol				ug/l	1	nv	-	-	-	-	-	-
2,4-Dimethylphenol				ug/l	1	nv	-	-	-	-	-	-
4-Chloro-3-methylphenol				ug/l	1	nv	-	-	-	-	-	-
2,4,6-Trichlorophenol				ug/l	1	200	-	-	-	-	-	-
2,4,5-Trichlorophenol				ug/l	1	nv	-	-	-	-	-	-
Pentachlorophenol				ug/l	1	2	-	-	-	-	-	-
1,3-Dichlorobenzene				ug/l	1	nv	-	-	-	-	-	-
1,4-Dichlorobenzene				ug/l	1	10	-	-	-	-	-	-
1,2-Dichlorobenzene				ug/l	1	10	-	-	-	-	-	-
1,2,4-Trichlorobenzene				ug/l	1	0.4	-	-	-	-	-	-
Nitrobenzene				ug/l	1	10	-	-	-	-	-	-
Azobenzene				ug/l	1	nv	-	-	-	-	-	-
Hexachlorobenzene				ug/l	1	0.03	-	-	-	-	-	-
Naphthalene				ug/l	1	1	-	-	-	-	-	-
Acenaphthylene				ug/l	1	nv	-	-	-	-	-	-
Acenaphthene				ug/l	1	nv	-	-	-	-	-	-
Fluorene				ug/l	1	nv	-	-	-	-	-	-
Phenanthrene				ug/l	1	nv	-	-	-	-	-	-
Anthracene				ug/l	1	10000	-	-	-	-	-	-
Fluoranthrene				ug/l	1	1	-	-	-	-	-	-
Pyrene				ug/l	1	nv	-	-	-	-	-	-
Benzo(a)anthracene				ug/l	1	nv	-	-	-	-	-	-
Chrysene				ug/l	1	nv	-	-	-	-	-	-
Benzo(b)fluoranthrene				ug/l	1	0.5	-	-	-	-	-	-
Benzo(k)fluoranthrene				ug/l	1	0.05	-	-	-	-	-	-
Benzo(a)pyrene				ug/l	1	0.01	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene				ug/l	1	0.05	-	-	-	-	-	-
Dibenzo(a,h)anthracene				ug/l	1	nv	-	-	-	-	-	-
Benzo(ghi)perylene				ug/l	1	0.05	-	-	-	-	-	-
2-Chloronaphthalene				ug/l	1	nv	-	-	-	-	-	-
2-Methylnaphthalene				ug/l	1	nv	-	-	-	-	-	-
Carbazole				ug/l	1	nv	-	-	-	-	-	-
Isophorone				ug/l	1	nv	-	-	-	-	-	-
Dibenzofuran				ug/l	1	nv	-	-	-	-	-	-
Dimethyl phthalate				ug/l	1	nv	-	-	-	-	-	-
Diethyl phthalate				ug/l	1	10	-	-	-	-	-	-
Di-n-butylphthalate				ug/l	1	2	-	-	-	-	-	-
Di-n-octylphthalate				ug/l	1	0.1	-	-	-	-	-	-
Bis(2-ethylhexyl)phthalate				ug/l	1	8	-	-	-	-	-	-
Butylbenzylphthalate				ug/l	1	1	-	-	-	-	-	-
4-Chloroaniline				ug/l	1	nv	-	-	-	-	-	-
2-Nitroaniline				ug/l	1	10	-	-	-	-	-	-
3-Nitroaniline				ug/l	1	10	-	-	-	-	-	-
4-Nitroaniline				ug/l	1	nv	-	-	-	-	-	-
2,4-Dinitrotoluene				ug/l	1	nv	-	-	-	-	-	-
2,6-Dinitrotoluene				ug/l	1	nv	-	-	-	-	-	-
Bis(2-chloroethyl)ether				ug/l	1	30	-	-	-	-	-	-
4-Bromophenylphenylether				ug/l	1	nv	-	-	-	-	-	-
4-Chlorophenylphenylether				ug/l	1	40	-	-	-	-	-	-
Hexachloroethane				ug/l	1	10	-	-	-	-	-	-
Hexachlorobutadiene				ug/l	1	0.1	-	-	-	-	-	-
Hexachlorocyclopentadiene				ug/l	1	nv	-	-	-	-	-	-
Bis(2-chloroethoxy)methane				ug/l	1	10	-	-	-	-	-	-
N-nitrosodi-n-propylamine				ug/l	1	nv	-	-	-	-	-	-
<b>SVOC-TIC</b>												
1H-Indene, 2,3-dihydro-4-methyl- (CAS)				ug/l	nv	nv	1.05	nd	nd	nd	nd	nd
1,2,4-Methenoazulene, decahydro-1,5,5,8a-tetramethyl-, [1S-(1.alpha.,2.alpha.,3a.beta.,4.alpha.,8a.beta.,9R*)]- (CAS)				ug/l	nv	nv	1.37	nd	nd	nd	nd	nd
Isolongifolene				ug/l	nv	nv	1.94	nd	nd	nd	nd	nd
Eicosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Heneicosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Docosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
14-.BETA.-H-PREGNA				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Hexacosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
9-Hexacosene				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Nonadecane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
1-(4-phenylcyclohexyl)-1-hexanone				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Octadecanoic acid, butyl ester				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Ethanol				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
1,6-Dimethylnaphthalene				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Butyl Octadecanoate				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Tetracosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd

IGV - Interim Guideline Value for Groundwater

xx - Exceeds IGV for Groundwater

MDL - Method Detection Limit

- Less than the MDL

na - Not Analysed

nv - No Value

nd - Not Detected

NDP - No Determination Possible

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 20: Groundwater Analytical Results: SVOCs

Island Area

Sample Type	Sample ID	Date	Parameters	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
							MW 102	MW 103	RC2	BH317	BH11	BH12
							28-Oct-08	28-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08
Phenol				ug/l	1	0.5	-	-	-	-	-	-
2-Chlorophenol				ug/l	1	200	-	-	-	-	-	-
2-Methylphenol				ug/l	1	nv	-	-	-	-	-	-
4-Methylphenol				ug/l	1	nv	-	-	-	-	-	-
2-Nitrophenol				ug/l	1	nv	-	-	-	-	-	-
4-Nitrophenol				ug/l	1	nv	-	-	-	-	-	-
2,4-Dichlorophenol				ug/l	1	nv	-	-	-	-	-	-
2,4-Dimethylphenol				ug/l	1	nv	-	-	-	-	-	-
4-Chloro-3-methylphenol				ug/l	1	nv	-	-	-	-	-	-
2,4,6-Trichlorophenol				ug/l	1	200	-	-	-	-	-	-
2,4,5-Trichlorophenol				ug/l	1	nv	-	-	-	-	-	-
Pentachlorophenol				ug/l	1	2	-	-	-	-	-	-
1,3-Dichlorobenzene				ug/l	1	nv	-	-	-	-	-	-
1,4-Dichlorobenzene				ug/l	1	10	-	-	-	-	-	-
1,2-Dichlorobenzene				ug/l	1	10	-	-	-	-	-	-
1,2,4-Trichlorobenzene				ug/l	1	0.4	-	-	-	-	-	-
Nitrobenzene				ug/l	1	10	-	-	-	-	-	-
Azobenzene				ug/l	1	nv	-	-	-	-	-	-
Hexachlorobenzene				ug/l	1	0.03	-	-	-	-	-	-
Naphthalene				ug/l	1	1	-	-	-	-	-	-
Acenaphthylene				ug/l	1	nv	-	-	-	-	-	-
Acenaphthene				ug/l	1	nv	-	-	-	-	-	-
Fluorene				ug/l	1	nv	-	-	-	-	-	-
Phenanthrene				ug/l	1	nv	-	-	-	-	-	-
Anthracene				ug/l	1	10000	-	-	-	-	-	-
Fluoranthrene				ug/l	1	1	-	-	-	-	-	-
Pyrene				ug/l	1	nv	-	-	-	-	-	-
Benzo(a)anthracene				ug/l	1	nv	-	-	-	-	-	-
Chrysene				ug/l	1	nv	-	-	-	-	-	-
Benzo(b)fluoranthrene				ug/l	1	0.5	-	-	-	-	-	-
Benzo(k)fluoranthrene				ug/l	1	0.05	-	-	-	-	-	-
Benzo(a)pyrene				ug/l	1	0.01	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene				ug/l	1	0.05	-	-	-	-	-	-
Dibenzo(a,h)anthracene				ug/l	1	nv	-	-	-	-	-	-
Benzo(ghi)perylene				ug/l	1	0.05	-	-	-	-	-	-
2-Chloronaphthalene				ug/l	1	nv	-	-	-	-	-	-
2-Methylnaphthalene				ug/l	1	nv	-	-	-	-	-	-
Carbazole				ug/l	1	nv	-	-	-	-	-	-
Isophorone				ug/l	1	nv	-	-	-	-	-	-
Dibenzofuran				ug/l	1	nv	-	-	-	-	-	-
Dimethyl phthalate				ug/l	1	nv	-	-	-	-	-	-
Diethyl phthalate				ug/l	1	10	-	-	-	-	-	-
Di-n-butylphthalate				ug/l	1	2	-	-	-	-	-	-
Di-n-octylphthalate				ug/l	1	0.1	-	-	-	-	-	-
Bis(2-ethylhexyl)phthalate				ug/l	1	8	-	-	-	-	-	-
Butylbenzylphthalate				ug/l	1	1	-	-	-	-	-	-
4-Chloroaniline				ug/l	1	nv	-	-	-	-	-	-
2-Nitroaniline				ug/l	1	10	-	-	-	-	-	-
3-Nitroaniline				ug/l	1	10	-	-	-	-	-	-
4-Nitroaniline				ug/l	1	nv	-	-	-	-	-	-
2,4-Dinitrotoluene				ug/l	1	nv	-	-	-	-	-	-
2,6-Dinitrotoluene				ug/l	1	nv	-	-	-	-	-	-
Bis(2-chloroethyl)ether				ug/l	1	30	-	-	-	-	-	-
4-Bromophenylphenylether				ug/l	1	nv	-	-	-	-	-	-
4-Chlorophenylphenylether				ug/l	1	40	-	-	-	-	-	-
Hexachloroethane				ug/l	1	10	-	-	-	-	-	-
Hexachlorobutadiene				ug/l	1	0.1	-	-	-	-	-	-
Hexachlorocyclopentadiene				ug/l	1	nv	-	-	-	-	-	-
Bis(2-chloroethoxy)methane				ug/l	1	10	-	-	-	-	-	-
N-nitrosodi-n-propylamine				ug/l	1	nv	-	-	-	-	-	-
<b>SVOC-TIC</b>												
1H-Indene, 2,3-dihydro-4-methyl- (CAS)				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
1,2,4-Methenoazulene, decahydro-1,5,5,8a-tetramethyl-, [1S-(1.alpha.,2.alpha.,3a.beta.,4.alpha.,8a.beta.,9R*)]- (CAS)				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Isolongifolene				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Eicosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Heneicosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Docosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
14-BETA.-H-PREGNA				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Hexacosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
9-Hexacosene				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Nonadecane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
1-(4-phenylcyclohexyl)-1-hexanone				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Octadecanoic acid, butyl ester				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Ethanol				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
1,6-Dimethylnaphthalene				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Butyl Octadecanoate				ug/l	nv	nv	nd	nd	nd	nd	nd	nd
Tetracosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd

IGV - Interim Guideline Value for Groundwater

xx - Exceeds IGV for Groundwater

MDL - Method Detection Limit

- Less than the MDL

na - Not Analysed

nv - No Value

nd - Not Detected

NDP - No Determination Possible

Client: ESB

Project: Phase 2 Environmental Investigation

Location: ESB Tarbert, Co. Kerry

Job No: 49341640

Table 20: Groundwater Analytical Results: SVOCs

Island Area
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Sample Type	Sample ID	Date	Groundwater					
			MW301	BH318	BH9	BH314	BH301	
			24-Oct-08	24-Oct-08	24-Oct-08	29-Oct-08	29-Oct-08	
Parameters	Units	MDL	IGV					
Phenol	ug/l	1	0.5	-	-	-	-	-
2-Chlorophenol	ug/l	1	200	-	-	-	-	-
2-Methylphenol	ug/l	1	nv	-	-	-	-	-
4-Methylphenol	ug/l	1	nv	-	-	-	-	-
2-Nitrophenol	ug/l	1	nv	-	-	-	-	-
4-Nitrophenol	ug/l	1	nv	-	-	-	-	-
2,4-Dichlorophenol	ug/l	1	nv	-	-	-	-	-
2,4-Dimethylphenol	ug/l	1	nv	-	-	-	-	-
4-Chloro-3-methylphenol	ug/l	1	nv	-	-	-	-	-
2,4,6-Trichlorophenol	ug/l	1	200	-	-	-	-	-
2,4,5-Trichlorophenol	ug/l	1	nv	-	-	-	-	-
Pentachlorophenol	ug/l	1	2	-	-	-	-	-
1,3-Dichlorobenzene	ug/l	1	nv	-	-	-	-	-
1,4-Dichlorobenzene	ug/l	1	10	-	-	-	-	-
1,2-Dichlorobenzene	ug/l	1	10	-	-	-	-	-
1,2,4-Trichlorobenzene	ug/l	1	0.4	-	-	-	-	-
Nitrobenzene	ug/l	1	10	-	-	-	-	-
Azobenzene	ug/l	1	nv	-	-	-	-	-
Hexachlorobenzene	ug/l	1	0.03	-	-	-	-	-
Naphthalene	ug/l	1	1	-	-	-	-	-
Acenaphthylene	ug/l	1	nv	-	-	-	-	-
Acenaphthene	ug/l	1	nv	-	-	-	-	-
Fluorene	ug/l	1	nv	-	-	-	-	-
Phenanthrene	ug/l	1	nv	-	-	-	-	-
Anthracene	ug/l	1	10000	-	-	-	-	-
Fluoranthrene	ug/l	1	1	-	-	-	-	-
Pyrene	ug/l	1	nv	-	-	-	-	-
Benzo(a)anthracene	ug/l	1	nv	-	-	-	-	-
Chrysene	ug/l	1	nv	-	-	-	-	-
Benzo(b)fluoranthrene	ug/l	1	0.5	-	-	-	-	-
Benzo(k)fluoranthrene	ug/l	1	0.05	-	-	-	-	-
Benzo(a)pyrene	ug/l	1	0.01	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	ug/l	1	0.05	-	-	-	-	-
Dibenzo(a,h)anthracene	ug/l	1	nv	-	-	-	-	-
Benzo(ghi)perylene	ug/l	1	0.05	-	-	-	-	-
2-Chloronaphthalene	ug/l	1	nv	-	-	-	-	-
2-Methylnaphthalene	ug/l	1	nv	-	-	-	-	-
Carbazole	ug/l	1	nv	-	-	-	-	-
Isophorone	ug/l	1	nv	-	-	-	-	-
Dibenzofuran	ug/l	1	nv	-	-	-	-	-
Dimethyl phthalate	ug/l	1	nv	-	-	-	-	-
Diethyl phthalate	ug/l	1	10	-	-	-	-	-
Di-n-butylphthalate	ug/l	1	2	-	-	-	-	-
Di-n-octylphthalate	ug/l	1	0.1	-	-	-	-	-
Bis(2-ethylhexyl)phthalate	ug/l	1	8	-	1	-	-	-
Butylbenzylphthalate	ug/l	1	1	-	-	-	-	-
4-Chloroaniline	ug/l	1	nv	-	-	-	-	-
2-Nitroaniline	ug/l	1	10	-	-	-	-	-
3-Nitroaniline	ug/l	1	10	-	-	-	-	-
4-Nitroaniline	ug/l	1	nv	-	-	-	-	-
2,4-Dinitrotoluene	ug/l	1	nv	-	-	-	-	-
2,6-Dinitrotoluene	ug/l	1	nv	-	-	-	-	-
Bis(2-chloroethyl)ether	ug/l	1	30	-	-	-	-	-
4-Bromophenylphenylether	ug/l	1	nv	-	-	-	-	-
4-Chlorophenylphenylether	ug/l	1	40	-	-	-	-	-
Hexachloroethane	ug/l	1	10	-	-	-	-	-
Hexachlorobutadiene	ug/l	1	0.1	-	-	-	-	-
Hexachlorocyclopentadiene	ug/l	1	nv	-	-	-	-	-
Bis(2-chloroethoxy)methane	ug/l	1	10	-	-	-	-	-
N-nitrosodi-n-propylamine	ug/l	1	nv	-	-	-	-	-
<b>SVOC-TIC</b>								
1H-Indene, 2,3-dihydro-4-methyl- (CAS)	ug/l	nv	nv	nd	nd	nd	nd	nd
1,2,4-Methenoazulene, decahydro-1,5,5,8a-tetramethyl-, [1S-(1.alpha.,2.alpha.,3a.beta.,4.alpha.,8a.beta.,9R*)]- (CAS)	ug/l	nv	nv	nd	nd	nd	nd	nd
Isolongifolene	ug/l	nv	nv	nd	nd	nd	nd	nd
Eicosane	ug/l	nv	nv	nd	nd	1.27	nd	nd
Heneicosane	ug/l	nv	nv	nd	nd	1.11	nd	nd
Docosane	ug/l	nv	nv	nd	nd	1.99	nd	nd
14-BETA.-H-PREGNA	ug/l	nv	nv	nd	nd	1.07	nd	nd
Hexacosane	ug/l	nv	nv	nd	nd	nd	nd	nd
9-Hexacosene	ug/l	nv	nv	nd	nd	nd	nd	nd
Nonadecane	ug/l	nv	nv	nd	nd	nd	nd	nd
1-(4-phenylcyclohexyl)-1-hexanone	ug/l	nv	nv	nd	9.8	nd	nd	nd
Octadecanoic acid, butyl ester	ug/l	nv	nv	nd	nd	nd	nd	nd
Ethanol	ug/l	nv	nv	nd	1.66	nd	nd	nd
1,6-Dimethylnaphthalene	ug/l	nv	nv	nd	2.14	nd	nd	nd
Butyl Octadecanoate	ug/l	nv	nv	nd	6.9	nd	nd	2.28
Tetracosane	ug/l	nv	nv	nd	1.1	nd	nd	1.02

IGV - Interim Guideline Value for Groundwater

xx - Exceeds IGV for Groundwater

MDL - Method Detection Limit

- Less than the MDL

na - Not Analysed

nv - No Value

nd - Not Detected

NDP - No Determination Possible

Client: ESB

Project: Phase 2 Environmental Investigation

Location: ESB Tarbert, Co. Kerry

Job No: 49341640

Table 20: Groundwater Analytical Results: SVOCs

Mainland Area

Sample Type	Sample ID	Date	Parameters	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	
							BH 321	BH 24	BH 25	BH1	BH5	MW202	
							29-Oct-08	29-Oct-08	29-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08	
Phenol				ug/l	1	0.5	-	-	-	-	-	NDP	-
2-Chlorophenol				ug/l	1	200	-	-	-	-	-	NDP	-
2-Methylphenol				ug/l	1	nv	-	-	-	-	-	NDP	-
4-Methylphenol				ug/l	1	nv	-	-	-	-	-	NDP	-
2-Nitrophenol				ug/l	1	nv	-	-	-	-	-	NDP	-
4-Nitrophenol				ug/l	1	nv	-	-	-	-	-	NDP	-
2,4-Dichlorophenol				ug/l	1	nv	-	-	-	-	-	NDP	-
2,4-Dimethylphenol				ug/l	1	nv	-	-	-	-	-	NDP	-
4-Chloro-3-methylphenol				ug/l	1	nv	-	-	-	-	-	NDP	-
2,4,6-Trichlorophenol				ug/l	1	200	-	-	-	-	-	NDP	-
2,4,5-Trichlorophenol				ug/l	1	nv	-	-	-	-	-	NDP	-
Pentachlorophenol				ug/l	1	2	-	-	-	-	-	NDP	-
1,3-Dichlorobenzene				ug/l	1	nv	-	-	-	-	-	NDP	-
1,4-Dichlorobenzene				ug/l	1	10	-	-	-	-	-	NDP	-
1,2-Dichlorobenzene				ug/l	1	10	-	-	-	-	-	NDP	-
1,2,4-Trichlorobenzene				ug/l	1	0.4	-	-	-	-	-	NDP	-
Nitrobenzene				ug/l	1	10	-	-	-	-	-	NDP	-
Azobenzene				ug/l	1	nv	-	-	-	-	-	NDP	-
Hexachlorobenzene				ug/l	1	0.03	-	-	-	-	-	NDP	-
Naphthalene				ug/l	1	1	-	-	-	-	-	NDP	-
Acenaphthylene				ug/l	1	nv	-	-	-	-	-	NDP	-
Acenaphthene				ug/l	1	nv	-	-	-	-	-	NDP	-
Fluorene				ug/l	1	nv	-	-	-	-	-	NDP	-
Phenanthrene				ug/l	1	nv	-	-	-	-	-	NDP	-
Anthracene				ug/l	1	10000	-	-	-	-	-	NDP	-
Fluoranthrene				ug/l	1	1	-	-	-	-	-	NDP	-
Pyrene				ug/l	1	nv	-	-	-	-	-	NDP	-
Benzo(a)anthracene				ug/l	1	nv	-	-	-	-	-	NDP	-
Chrysene				ug/l	1	nv	-	-	-	-	-	NDP	-
Benzo(b)fluoranthrene				ug/l	1	0.5	-	-	-	-	-	NDP	-
Benzo(k)fluoranthrene				ug/l	1	0.05	-	-	-	-	-	NDP	-
Benzo(a)pyrene				ug/l	1	0.01	-	-	-	-	-	NDP	-
Indeno(1,2,3-cd)pyrene				ug/l	1	0.05	-	-	-	-	-	NDP	-
Dibenzo(a,h)anthracene				ug/l	1	nv	-	-	-	-	-	NDP	-
Benzo(ghi)perylene				ug/l	1	0.05	-	-	-	-	-	NDP	-
2-Chloronaphthalene				ug/l	1	nv	-	-	-	-	-	NDP	-
2-Methylnaphthalene				ug/l	1	nv	-	-	-	-	-	NDP	-
Carbazole				ug/l	1	nv	-	-	-	-	-	NDP	-
Isophorone				ug/l	1	nv	-	-	-	-	-	NDP	-
Dibenzofuran				ug/l	1	nv	-	-	-	-	-	NDP	-
Dimethyl phthalate				ug/l	1	nv	-	-	-	-	-	NDP	-
Diethyl phthalate				ug/l	1	10	-	-	-	-	-	NDP	-
Di-n-butylphthalate				ug/l	1	2	-	-	-	-	-	NDP	-
Di-n-octylphthalate				ug/l	1	0.1	-	-	-	-	-	NDP	-
Bis(2-ethylhexyl)phthalate				ug/l	1	8	-	-	-	-	-	NDP	-
Butylbenzylphthalate				ug/l	1	1	-	-	-	-	-	NDP	-
4-Chloroaniline				ug/l	1	nv	-	-	-	-	-	NDP	-
2-Nitroaniline				ug/l	1	10	-	-	-	-	-	NDP	-
3-Nitroaniline				ug/l	1	10	-	-	-	-	-	NDP	-
4-Nitroaniline				ug/l	1	nv	-	-	-	-	-	NDP	-
2,4-Dinitrotoluene				ug/l	1	nv	-	-	-	-	-	NDP	-
2,6-Dinitrotoluene				ug/l	1	nv	-	-	-	-	-	NDP	-
Bis(2-chloroethyl)ether				ug/l	1	30	-	-	-	-	-	NDP	-
4-Bromophenylphenylether				ug/l	1	nv	-	-	-	-	-	NDP	-
4-Chlorophenylphenylether				ug/l	1	40	-	-	-	-	-	NDP	-
Hexachloroethane				ug/l	1	10	-	-	-	-	-	NDP	-
Hexachlorobutadiene				ug/l	1	0.1	-	-	-	-	-	NDP	-
Hexchlorocyclopentadiene				ug/l	1	nv	-	-	-	-	-	NDP	-
Bis(2-chloroethoxy)methane				ug/l	1	10	-	-	-	-	-	NDP	-
N-nitrosodi-n-propylamine				ug/l	1	nv	-	-	-	-	-	NDP	-
<b>SVOC-TIC</b>													
1H-Indene, 2,3-dihydro-4-methyl- (CAS)				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd
1,2,4-Methenoazulene, decahydro-1,5,5,8a-tetramethyl-, [1S-(1.alpha.,2.alpha.,3a.beta.,4.alpha.,8a.beta.,9R*)]- (CAS)				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd
Isolongifolene				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd
Eicosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	1.27
Heneicosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	1.11
Docosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	1.99
14-BETA.-H-PREGNA				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	1.07
Hexacosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	1.04
9-Hexacosene				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	1.54
Nonadecane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd
1-(4-phenylcyclohexyl)-1-hexanone				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd
Octadecanoic acid, butyl ester				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd
Ethanol				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd
1,6-Dimethylnaphthalene				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd
Butyl Octadecanoate				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd
Tetracosane				ug/l	nv	nv	nd	nd	nd	nd	nd	nd	nd

IGV - Interim Guideline Value for Groundwater

xx - Exceeds IGV for Groundwater

MDL - Method Detection Limit

- Less than the MDL

na - Not Analysed

nv - No Value

nd - Not Detected

NDP - No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 21:** Groundwater Analytical Results: PCBs

Island Area

Sample Type	Groundwater											
Sample ID	Groundwater											
Date	Groundwater											
Parameter	Units	MDL	IGV	BH 309A	BH 319	BH 311	BH 306	RC 1	MW 102	MW 103	MW 101	BH318
<b>PCBs</b>												
PCB Congener 28	ug/L	0.01	nv	-	-	-	-	-	-	-	-	-
PCB Congener 52	ug/L	0.01	nv	-	-	-	-	-	-	-	-	-
PCB Congener 101	ug/L	0.01	nv	-	-	-	-	-	-	-	-	-
PCB Congener 118	ug/L	0.01	nv	-	-	-	-	-	-	-	-	-
PCB Congener 153	ug/L	0.01	nv	-	-	-	-	-	-	-	-	-
PCB Congener 138	ug/L	0.01	nv	-	-	-	-	-	-	-	-	-
PCB Congener 180	ug/L	0.01	nv	-	-	-	-	-	-	-	-	-
PCB Total of 7 Congeners	ug/L	0.01	0.01	-	-	-	-	-	-	-	-	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 NDP No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 21:** Groundwater Analytical Results: PCBs

Island Area

Sample Type													
Sample ID													
Date													
Parameter	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Ground Water						
				BH9	RC2	BH317	BH11	BH12	MW301	BH318	BH9	BH314	BH301
				24-Oct-08	24-Oct-08	29-Oct-08	29-Oct-08						
<b>PCBs</b>													
PCB Congener 28	ug/L	0.01	nv	-	-	-	-	-	-	0.037	-	-	-
PCB Congener 52	ug/L	0.01	nv	-	-	-	-	-	-	0.049	-	-	-
PCB Congener 101	ug/L	0.01	nv	-	-	-	-	-	-	0.083	-	-	-
PCB Congener 118	ug/L	0.01	nv	-	-	-	-	-	-	0.061	-	-	-
PCB Congener 153	ug/L	0.01	nv	-	-	-	-	-	-	0.036	-	-	-
PCB Congener 138	ug/L	0.01	nv	-	-	-	-	-	-	0.068	-	-	-
PCB Congener 180	ug/L	0.01	nv	-	-	-	-	-	-	-	-	-	-
PCB Total of 7 Congeners	ug/L	0.01	0.01	-	-	-	-	-	-	<b>0.333</b>	-	-	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 NDP No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 21:** Groundwater Analytical Results: PCBs

Mainland Area

Sample Type									
Sample ID									
Date									
Parameter	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
				BH 321	BH 24	BH 25	BH1	BH5	MW202
				29-Oct-08	29-Oct-08	29-Oct-08	24-Oct-08	24-Oct-08	24-Oct-08
<b>PCBs</b>									
PCB Congener 28	ug/L	0.01	nv	-	-	-	-	NDP	-
PCB Congener 52	ug/L	0.01	nv	-	-	-	-	NDP	-
PCB Congener 101	ug/L	0.01	nv	-	-	-	-	NDP	-
PCB Congener 118	ug/L	0.01	nv	-	-	-	-	NDP	-
PCB Congener 153	ug/L	0.01	nv	-	-	-	-	NDP	-
PCB Congener 138	ug/L	0.01	nv	-	-	-	-	NDP	-
PCB Congener 180	ug/L	0.01	nv	-	-	-	-	NDP	-
PCB Total of 7 Congeners	ug/L	0.01	0.01	-	-	-	-	NDP	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 NDP No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 22:** Groundwater Analytical Results: Biological

Island Area

Sample Type	Groundwater								
Sample ID	BH 309A	RC 1	MW 101	MW 102	MW 103	RC2			
Date	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08	28-Oct-08			
Parameter	Units	MDL	IGV						
<b>Biological</b>									
Biological Oxygen Demand (BOD)	mg/L	2	nv	2	-	17	11	7	3
Chemical Oxygen Demand (COD)	mg/L	15	nv	36	-	613	203	51	59
Faecal coliforms	cfu/100ml	1	0	-	-	900	-	124	19
Total coliforms	cfu/100ml	nv	0	44	-	130000	56	20000	700

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 22:** Groundwater Analytical Results: Biological

Island Area

Sample Type										
Sample ID										
Date										
Parameter	Units	MDL	IGV	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Ground Water
Biological										
Biological Oxygen Demand (BOD)	mg/L	2	nv	-	-	3	-	4	-	15
Chemical Oxygen Demand (COD)	mg/L	15	nv	239	18	-	16	318	-	206
Faecal coliforms	cfu/100ml	1	0	1	37	200	10	-	8	2,190,000
Total coliforms	cfu/100ml	nv	0	7	400	400	100	31	-	350,000

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 22:** Groundwater Analytical Results: Biological

Mainland Area
---------------

Sample Type			Groundwater	Groundwater
Sample ID			BH1	MW202
Date			28-Oct-08	28-Oct-08
Parameter	Units	MDL	IGV	
<b>Biological</b>				
Biological Oxygen Demand (BOD)	mg/L	2	nv	- 4
Chemical Oxygen Demand (COD)	mg/L	15	nv	185 3908
Faecal coliforms	cfu/100ml	1	0	9 19
Total coliforms	cfu/100ml	nv	0	600 700

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 23:** Hydrocarbon Laboratory Results - Surface Water

Island Area

Sample Type					Surface Water				
Sample ID					SW39	SW 41	SW 40	SW 33	SW 6
Date					24-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08
Parameters	UNITS	MDL	EQS						
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	ug/L	10	nv	-	-	-	-	-	-
C7-C8	ug/L	10	nv	-	-	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-	-	-
Total Aromatics	ug/L	nv	nv	-	-	-	-	-	-
<b>Aliphatics</b>									
C5-C6	ug/L	10	nv	-	-	-	-	-	-
C6-C8	ug/L	10	nv	-	-	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-	-	-
Total Aliphatics (MO)	ug/L	10	300	-	-	-	-	-	-
Total TPH	ug/L	nv	nv	-	-	-	-	-	-
Diesel Range Organics (DRO)	ug/L	nv	nv	-	-	-	-	-	-
<b>BTEX</b>									
Benzene	ug/L	10	10	-	-	-	-	-	-
Toluene	ug/L	10	10	-	-	-	-	-	-
Ethylbenzene	ug/L	10	10	-	-	-	-	-	-
Total Xylene	ug/L	10	10	-	-	-	-	-	-
MTBE	ug/L	10	nv	-	-	-	-	-	-
BTEX	ug/L	nv	nv	-	-	-	-	-	-

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 23:** Hydrocarbon Laboratory Results -  
 Surface Water

Island Area

Sample Type				Surface Water					
Sample ID				SW 7	SW 10	SW 12	SW 15	SW 25	SW 22
Date				30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08
Parameters	UNITS	MDL	EQS						
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	ug/L	10	nv	-	-	-	-	-	-
C7-C8	ug/L	10	nv	-	-	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-	-	-
Total Aromatics	ug/L	nv	nv	-	-	-	-	-	-
<b>Aliphatics</b>									
C5-C6	ug/L	10	nv	-	-	-	-	-	-
C6-C8	ug/L	10	nv	-	-	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-	-	-
Total Aliphatics (MO)	ug/L	10	300	-	-	-	-	-	-
Total TPH	ug/L	nv	nv	-	-	-	-	-	-
Diesel Range Organics (DRO)	ug/L	nv	nv	-	-	-	-	-	-
<b>BTEX</b>									
Benzene	ug/L	10	10	-	-	-	-	-	-
Toluene	ug/L	10	10	-	-	-	-	-	-
Ethylbenzene	ug/L	10	10	-	-	-	-	-	-
Total Xylene	ug/L	10	10	-	-	-	-	-	-
MTBE	ug/L	10	nv	-	-	-	-	-	-
BTEX	ug/L	nv	nv	-	-	-	-	-	-

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 23:** Hydrocarbon Laboratory Results -  
 Surface Water

Mainland Area
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Sample Type				Surface Water	Surface Water	Surface Water	Surface Water
Sample ID				SW37	SW38	SW 42	SW 17/18
Date				24-Oct-08	24-Oct-08	30-Oct-08	30-Oct-08
Parameters	UNITS	MDL	EQS				
<b>Hydrocarbons</b>							
<b>Aromatics</b>							
C6-C7	ug/L	10	nv	-	-	-	-
C7-C8	ug/L	10	nv	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-
Total Aromatics	ug/L	nv	nv	-	-	-	-
<b>Aliphatics</b>							
C5-C6	ug/L	10	nv	-	-	-	-
C6-C8	ug/L	10	nv	-	-	-	-
C8-C10	ug/L	10	nv	-	-	-	-
C10-C12	ug/L	10	nv	-	-	-	-
C12-C16	ug/L	10	nv	-	-	-	-
C16-C21	ug/L	10	nv	-	-	-	-
C21-C35	ug/L	10	nv	-	-	-	-
Total Aliphatics (MO)	ug/L	10	300	-	-	-	-
Total TPH	ug/L	nv	nv	-	-	-	-
Diesel Range Organics (DRO)	ug/L	nv	nv	-	-	-	-
<b>BTEX</b>							
Benzene	ug/L	10	10	-	-	-	-
Toluene	ug/L	10	10	-	-	-	-
Ethylbenzene	ug/L	10	10	-	-	-	-
Total Xylene	ug/L	10	10	-	-	-	-
MTBE	ug/L	10	nv	-	-	-	-
BTEX	ug/L	nv	nv	-	-	-	-

EQS	EPA Proposed Environmental Quality Standards for Surface Water
xx	Exceeds EQS for Surface Waters
MDL	Method Detection Limit
-	Less than the MDL
na	Not Analysed
nv	No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 24:** PAH Laboratory Results - Surface Water

Island Area
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Sample Type				Surface Water				
Sample ID				SW39	SW 41	SW 40	SW 33	SW 6
Date				24-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08
Parameters	UNITS	MDL	EQS					
<b>PAHs</b>								
Naphthalene	ug/L	0.01	nv	-	-	-	-	-
Acenaphthylene	ug/L	0.01	nv	-	-	-	-	-
Acenaphthene	ug/L	0.01	nv	-	-	-	-	-
Fluorene	ug/L	0.01	nv	-	-	-	-	-
Phenanthrene	ug/L	0.01	nv	-	-	-	-	-
Anthracene	ug/L	0.01	nv	-	-	-	-	-
Fluoranthene*	ug/L	0.01	nv	-	-	-	-	-
Pyrene	ug/L	0.01	nv	-	-	-	-	-
Benzo(a)anthracene	ug/L	0.01	nv	-	-	-	-	-
Chrysene	ug/L	0.01	nv	-	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/L	0.01	nv	-	-	-	-	-
Benzo(a)pyrene*	ug/L	0.01	nv	-	-	-	-	-
Indeno(123cd)pyrene*	ug/L	0.01	nv	-	-	-	-	-
Dibenzo(ah)anthracene	ug/L	0.01	nv	-	-	-	-	-
Benzo(ghi)perylene*	ug/L	0.01	nv	-	-	-	-	-
Sum 6 PAHs	ug/L	nv	0.2	-	-	-	-	-
Total 16 EPA PAHs	ug/L	nv	nv	-	-	-	-	-

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 24:** PAH Laboratory Results - Surface Water

Island Area

Sample Type	Surface Water					
Sample ID	SW 7	SW 10	SW 12	SW 15	SW 25	SW 22
Date	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08
Parameters	UNITS	MDL	EQS			
<b>PAHs</b>						
Naphthalene	ug/L	0.01	nv	-	-	-
Acenaphthylene	ug/L	0.01	nv	-	-	-
Acenaphthene	ug/L	0.01	nv	-	-	-
Fluorene	ug/L	0.01	nv	-	-	-
Phenanthrene	ug/L	0.01	nv	-	-	-
Anthracene	ug/L	0.01	nv	-	-	-
Fluoranthene*	ug/L	0.01	nv	-	-	-
Pyrene	ug/L	0.01	nv	-	-	-
Benzo(a)anthracene	ug/L	0.01	nv	-	-	-
Chrysene	ug/L	0.01	nv	-	-	-
Benzo(b)+Benzo(k)fluoranthene*	ug/L	0.01	nv	-	-	-
Benzo(a)pyrene*	ug/L	0.01	nv	-	-	-
Indeno(123cd)pyrene*	ug/L	0.01	nv	-	-	-
Dibenzo(ah)anthracene	ug/L	0.01	nv	-	-	-
Benzo(ghi)perylene*	ug/L	0.01	nv	-	-	-
Sum 6 PAHs	ug/L	nv	0.2	-	-	-
Total 16 EPA PAHs	ug/L	nv	nv	-	-	-

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 24:** PAH Laboratory Results - Surface Water

Mainland Area
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Sample Type				Surface Water	Surface Water	Surface Water	Surface Water
Sample ID				SW37	SW38	SW 42	SW 17/18
Date				24-Oct-08	24-Oct-08	30-Oct-08	30-Oct-08
Parameters	UNITS	MDL	EQS				
<b>PAHs</b>							
Naphthalene	ug/L	0.01	nv	-	-	-	-
Acenaphthylene	ug/L	0.01	nv	-	-	-	-
Acenaphthene	ug/L	0.01	nv	-	-	-	-
Fluorene	ug/L	0.01	nv	-	-	-	-
Phenanthrene	ug/L	0.01	nv	-	-	-	-
Anthracene	ug/L	0.01	nv	-	-	-	-
Fluoranthene*	ug/L	0.01	nv	-	-	-	-
Pyrene	ug/L	0.01	nv	-	-	-	-
Benzo(a)anthracene	ug/L	0.01	nv	-	-	-	-
Chrysene	ug/L	0.01	nv	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene*	ug/L	0.01	nv	-	-	-	-
Benzo(a)pyrene*	ug/L	0.01	nv	-	-	-	-
Indeno(123cd)pyrene*	ug/L	0.01	nv	-	-	-	-
Dibenzo(ah)anthracene	ug/L	0.01	nv	-	-	-	-
Benzo(ghi)perylene*	ug/L	0.01	nv	-	-	-	-
Sum 6 PAHs	ug/L	nv	0.2	-	-	-	-
Total 16 EPA PAHs	ug/L	nv	nv	-	-	-	-

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 25:** Metals Laboratory Results - Surface Water

Island Area

Sample Type	Surface Water					
Sample ID	SW39	SW 41	SW 40	SW 33	SW 6	SW 7
Date	24-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08
Parameters	UNITS	MDL	EQS			
<b>Metals</b>						
Antimony	mg/L	0.001	0.02	-	-	-
Arsenic	mg/L	0.001	0.05	0.05	0.005	0.017
Barium	mg/L	0.001	0.5	0.015	0.003	0.017
Cadmium	mg/L	0.0004	0.005	-	-	-
Chromium	mg/L	0.001	0.1	0.015	0.002	0.007
Cobalt	mg/L	0.001	nv	-	-	-
Copper	mg/L	0.001	0.05	0.002	-	0.002
Lead	mg/L	0.001	0.005	0.001	-	-
Mercury	mg/L	0.00005	0.0001	-	-	-
Molybdenum	mg/L	0.001	0.1	0.007	0.003	0.005
Nickel	mg/L	0.001	0.1	0.003	-	0.003
Selenium	mg/L	0.001	0.02	0.083	0.014	0.082
Vanadium	mg/L	0.001	nv	0.037	-	-
Zinc	mg/L	0.001	0.1	-	0.013	0.013

EQS EPA Proposed Environmental Quality Standards  
 for Surface Water  
**xx** Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 25:** Metals Laboratory Results - Surface Water

Island Area

Sample Type								
Sample ID								
Date								
Parameters	UNITS	MDL	EQS	Surface Water SW 10	Surface Water SW 12	Surface Water SW 15	Surface Water SW 25	Surface Water SW 22
<b>Metals</b>								
Antimony	mg/L	0.001	0.02	-	0.002	0.001	0.001	-
Arsenic	mg/L	0.001	0.05	-	0.016	-	-	0.014
Barium	mg/L	0.001	0.5	0.003	0.014	0.011	0.008	0.016
Cadmium	mg/L	0.0004	0.005	-	-	-	-	-
Chromium	mg/L	0.001	0.1	0.002	0.008	0.002	0.002	0.008
Cobalt	mg/L	0.001	nv	-	-	-	-	-
Copper	mg/L	0.001	0.05	0.002	0.001	0.008	0.003	0.002
Lead	mg/L	0.001	0.005	-	-	-	-	-
Mercury	mg/L	0.00005	0.0001	-	-	-	-	-
Molybdenum	mg/L	0.001	0.1	0.098	0.006	0.002	0.004	0.006
Nickel	mg/L	0.001	0.1	0.006	0.003	0.003	0.01	0.003
Selenium	mg/L	0.001	0.02	-	0.087	-	-	0.084
Vanadium	mg/L	0.001	nv	0.111	0.114	0.066	0.645	-
Zinc	mg/L	0.001	0.1	0.023	0.02	0.024	0.032	0.012

EQS EPA Proposed Environmental Quality Standards  
 for Surface Water  
**xx** Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 25:** Metals Laboratory Results - Surface Water

Mainland Area

Sample Type	Surface Water			
Sample ID	SW37	SW 38	SW 42	SW 17/18
Date	24-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08
Parameters	UNITS	MDL	EQS	
<b>Metals</b>				
Antimony	mg/L	0.001	0.02	-
Arsenic	mg/L	0.001	0.05	-
Barium	mg/L	0.001	0.5	0.006
Cadmium	mg/L	0.0004	0.005	-
Chromium	mg/L	0.001	0.1	0.01
Cobalt	mg/L	0.001	nv	-
Copper	mg/L	0.001	0.05	0.002
Lead	mg/L	0.001	0.005	-
Mercury	mg/L	0.00005	0.0001	-
Molybdenum	mg/L	0.001	0.1	-
Nickel	mg/L	0.001	0.1	0.001
Selenium	mg/L	0.001	0.02	-
Vanadium	mg/L	0.001	nv	0.002
Zinc	mg/L	0.001	0.1	0.005

EQS EPA Proposed Environmental Quality Standards for Surface Water  
**xx** Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 26: Various Laboratory Results - Surface Water

Island Area

Sample Type	Island Area								
Sample ID	Surface Water								
Date	SW39	SW 41	SW 40	SW 33	SW 6	SW 7			
Parameter	Units	MDL	EQS	24-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08
<b>Anions and Cations</b>									
Aluminium	mg/L	0.002	0.2	na	0.004	-	-	-	0.045
Boron	mg/L	0.003	2	na	0.619	2,154	2,322	0.015	0.248
Calcium	mg/L	0.12	nv	na	40.5	222.20	237	2.4	24.6
Chloride	mg/L	1	250	na	2,241	13,716	12,344	2	1,009
Fluoride	mg/L	0.1	1	na	0.4	0.4	0.3	-	0.3
Iron	mg/L	0.002	1	na	0.258	0.015	0.033	0.108	0.094
Potassium (Total as K)	mg/L	0.2	nv	na	45.9	23.6	225.6	0.5	21.5
Managanese	mg/L	0.001	0.3	na	0.316	0.001	0.001	0.002	0.006
Sodium (Total as Na)	mg/L	0.2	nv	na	1201	6441	6521	4.9	497.2
Sulphate	mg/L	3	200	na	300	1,473	1,605	-	128
Alkalinity as CaCO <sub>3</sub>	mg/L	1	nv	na	130	160	170	20	80
Total Hardness as CaCO <sub>3</sub>	mg/L	1	nv	na	399	3092	3308	7	233
Total Dissolved Solids (TDS)	mg/L	5	nv	na	3160	19200	20200	16	1400
<b>Nutrients</b>									
Ammonia**	mg/L	0.257	0.8	0.5	-	-	0.4	0.2	-
Nitrate (as NO <sub>3</sub> )	mg/L	0.3	50	-	1.8	-	-	-	1
Nitrite (as NO <sub>2</sub> )	mg/L	0.05	0.2	0.05	0.05	0.06	0.14	-	0.08
Phosphate	mg/L	0.03	0.05	-	0.13	0.11	0.07	0.04	0.24
<b>Miscellaneous</b>									
Conductivity	mS/cm	0.014	1	37	6	31	31	32	2,901
pH	pH Units	nv	>6-<9	7.94	7.29	8	8.02	7.48	7.8
Temperature***	° Celcius	nv	nv	18.83	na	na	na	na	na
Redox Potential***	mV	na	nv	160	150	170	160	120	160
Total Phenols	mg/L	0.01	0.0005	0.02	0.06	0.06	0.07	0.07	0.08
Total Cyanide	mg/L	0.05	0.01	-	-	-	-	-	-
PCB Total of 7 Congeners	ug/L	0.010	1.0	-	-	-	-	-	-
SVOCs	ug/L	100	nv	-*	-*	-*	-*	-*	-*
VOCs	ug/L	1	nv	-*	-*	-*	-*	-*	-*

- EQS EPA Proposed Environmental Quality Standards for Surface Water
- xx Exceeds EQS for Surface Waters
- MDL Method Detection Limit
- Less than the MDL
- na Not Analysed
- nv no value
- \* All individual SVOCs and VOCs were less than detection limit. No TICs were detected.
- \*\* Conversion factor of 1.286 used to convert ammoniacial nitrogen (as N) to ammonia (as ammonium as NH<sub>4</sub>)
- \*\*\* Measured in the field

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 26: Various Laboratory Results - Surface Water

Island Area

Sample Type	Surface Water								
	Sample ID	SW 10	SW 12	SW 15	SW 25	SW 22	SW 8		
	Date	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08	30-Oct-08		
Parameter	Units	MDL	EQS						
<b>Anions and Cations</b>									
Aluminium	mg/L	0.002	0.2	-	-	0.009	-	-	na
Boron	mg/L	0.003	2	0.025	2.391	0.017	0.014	2.274	na
Calcium	mg/L	0.12	nv	35.8	236.7	18.7	62.0	231.4	na
Chloride	mg/L	1	250	34	12,771	18	26	15,833	na
Fluoride	mg/L	0.1	1	0.5	0.4	-	0.3	0.4	na
Iron	mg/L	0.002	1	0.040	0.052	0.077	0.021	0.043	na
Potassium (Total as K)	mg/L	0.2	nv	5.9	234.5	1.7	2.7	252.6	na
Managanese	mg/L	0.001	0.3	-	0.003	-	0.007	-	na
Sodium (Total as Na)	mg/L	0.2	nv	55.6	6749	13.9	22.1	7190	na
Sulphate	mg/L	3	200	44	1,672	8	19	1,601	na
Alkalinity as CaCO <sub>3</sub>	mg/L	1	nv	140	150	80	200	160	na
Total Hardness as CaCO <sub>3</sub>	mg/L	1	nv	101	3395	55	182	3291	na
Total Dissolved Solids (TDS)	mg/L	5	nv	198	20700	81	231	19700	na
<b>Nutrients</b>									
Ammonia**	mg/L	0.257	0.8	-	0.2	-	-	-	-
Nitrate (as NO <sub>3</sub> )	mg/L	0.3	50	7	-	0.7	0.6	-	-
Nitrite (as NO <sub>2</sub> )	mg/L	0.05	0.2	0.29	0.09	-	0.07	0.08	0.11
Phosphate	mg/L	0.03	0.05	1.11	0.11	-	-	0.08	-
<b>Miscellaneous</b>									
Conductivity	mS/cm	0.014	1	0.436	32	0.182	0.464	32.5	na
pH	pH Units	nv	>6-<9	7.88	8	8.08	7.64	8.04	na
Temperature***	° Celcius	nv	nv	na	na	na	na	na	na
Redox Potential***	mV	na	nv	140	170	130	140	160	na
Total Phenols	mg/L	0.01	0.0005	0.06	0.07	0.07	0.08	0.07	-
Total Cyanide	mg/L	0.05	0.01	-	-	-	-	-	na
PCB Total of 7 Congeners	ug/L	0.010	1.0	-	-	-	-	-	na
SVOCs	ug/L	100	nv	-*	-*	-*	-*	-*	na
VOCs	ug/L	1	nv	-*	-*	-*	-*	-*	na

- EQS EPA Proposed Environmental Quality Standards for Surface Water
- xx Exceeds EQS for Surface Waters
- MDL Method Detection Limit
- Less than the MDL
- na Not Analysed
- nv no value
- \* All individual SVOCs and VOCs were less than detection limit. No TICs were detected.
- \*\* Conversion factor of 1.286 used to convert ammoniacial nitrogen (as N) to ammonia (as ammonium as NH<sub>4</sub>)
- \*\*\* Measured in the field

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 26:** Various Laboratory Results - Surface Water

Mainland Area

Sample Type				Surface Water	Surface Water	Surface Water	Surface Water
Sample ID				SW37	SW38	SW 42	SW 17/18
Date				24-Oct-08	24-Oct-08	30-Oct-08	30-Oct-08
Parameter	Units	MDL	EQS				
<b>Anions and Cations</b>							
Aluminium	mg/L	0.002	0.2	-	0.008	-	-
Boron	mg/L	0.003	2	0.006	0.019	1.818	2,560
Calcium	mg/L	0.12	nv	16.47	15.62	185.2	255.2
Chloride	mg/L	1	250	42	86	9,993	16,831
Fluoride	mg/L	0.1	1	-	-	0.3	0.4
Iron	mg/L	0.002	1	0.018	0.073	0.050	0.049
Potassium (Total as K)	mg/L	0.2	nv	5.3	6.8	183.7	253.6
Managanese	mg/L	0.001	0.3	-	0.006	0.015	0.001
Sodium (Total as Na)	mg/L	0.2	nv	25.9	54.9	5196	7158
Sulphate	mg/L	3	200	9	21	1,280	1,754
Alkalinity as CaCO <sub>3</sub>	mg/L	1	nv	60	60	130	170
Total Hardness as CaCO <sub>3</sub>	mg/L	1	nv	65	72	2592	3660
Total Dissolved Solids (TDS)	mg/L	5	nv	126	451	15600	22700
<b>Nutrients</b>							
Ammonia**	mg/L	0.257	0.8	0.6	0.5	0.4	0.5
Nitrate (as NO <sub>3</sub> )	mg/L	0.3	50	19.3	15.5	-	-
Nitrite (as NO <sub>2</sub> )	mg/L	0.05	0.2	0.1	0.08	0.09	0.06
Phosphate	mg/L	0.03	0.05	0.04	0.11	-	0.12
<b>Miscellaneous</b>							
Conductivity	mS/cm	0.014	1	0.272	0.422	25.5	34.5
pH	pH Units	nv	>6-<9	7.24	7.18	7.81	7.88
Temperature***	° Celcius	nv	nv	10.29	10.29	na	na
Redox Potential***	mV	na	nv	120	130	160	140
Total Phenols	mg/L	0.01	0.0005	0.01	0.02	0.07	0.07
Total Cyanide	mg/L	0.05	0.01	-	-	-	-
PCB Total of 7 Congeners	ug/L	0.010	1.0	-	-	-	-
SVOCs	ug/L	100	nv	-*	-*	-*	-*
VOCs	ug/L	1	nv	-*	-*	-*	-*

- EQS EPA Proposed Environmental Quality Standards for Surface Water
- xx Exceeds EQS for Surface Waters
- MDL Method Detection Limit
- Less than the MDL
- na Not Analysed
- nv no value
- \* All individual SVOCs and VOCs were less than detection limit. No TICs were detected.
- \*\* Conversion factor of 1.286 used to convert ammoniacial nitrogen (as N) to ammonia (as ammonium as NH<sub>4</sub>)
- \*\*\* Measured in the field

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 27:** Biological Laboratory Results - Surface Water

Island Area

Sample Type				Surface Water						
Sample ID				SW 41	SW 6	SW 10	SW 15	SW 25	SW 8	SW 39
Date				30-Oct-08						
Parameter	Units	MDL	EQS							
<b>Biological</b>										
Biological Oxygen Demand (BOD)	mg/L	2	4	3	-	5	-	-	2	5
Chemical Oxygen Demand (COD)	mg/L	15	nv	54	-	-	-	-	75	17
Total coliforms	cfu/100ml	1	5,000	500	400	10,000	10,000	200	2,600	400
Faecal coliforms	cfu/100ml	1	1,000	100	31	10	-	-	1	2

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 27:** Biological Laboratory Results - Surface Water

Mainland Area
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Sample Type				Surface Water	Surface Water	Surface Water
Sample ID				SW 37	SW 38	SW 42
Date				30-Oct-08	30-Oct-08	30-Oct-08
Parameter	Units	MDL	EQS			
<b>Biological</b>						
Biological Oxygen Demand (BOD)	mg/L	2	4	3	5	-
Chemical Oxygen Demand (COD)	mg/L	15	nv	15	85	106
Total coliforms	cfu/100ml	1	5,000	-	1,200	300
Faecal coliforms	cfu/100ml	1	1,000	-	-	1

EQS	EPA Proposed Environmental Quality Standards for Surface Water
xx	Exceeds EQS for Surface Waters
MDL	Method Detection Limit
-	Less than the MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert  
**Job Number** 49341640  
**Table 28:** Soil & Sediment Analysis Summary

Island Area	Mainland Area
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Analyte	Units	Range	Controlled Water GAC	Human Health GAC	EPA - 95 percentile	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	No. of Results Exceeding Controlled Water GAC	No. of Results Exceeding Human Health GAC	No. of Results Exceeding EPA Value	No. of Results Exceeding Dutch S Value	No. of Results Exceeding Dutch I Value	No. of Results Exceeding Controlled Water GAC	No. of Results Exceeding Human Health GAC	No. of Results Exceeding EPA Value	No. of Results Exceeding Dutch S Value	No. of Results Exceeding Dutch I Value
<b>Hydrocarbons</b>																	
TPH	mg/kg	<0.1 - 6409.476	0.07420781	nv	nv	nv	nv	24	-	-	-	-	3	-	-	-	-
Total Aliphatics (Mineral Oil)	mg/kg	<0.1 - 6407	nv	nv	nv	50	5000	-	-	-	8	2	-	-	-	2	-
Benzene	mg/kg	Not Detected	0.00124732	1.5	nv	0.01	1	-	-	-	-	-	-	-	-	-	-
Toluene	mg/kg	Not Detected	0.01297456	150	nv	0.01	130	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/kg	Not Detected	0.03662602	48000	nv	0.03	50	-	-	-	-	-	-	-	-	-	-
Xylene	mg/kg	Not Detected	0.03596041	320	nv	0.1	25	-	-	-	-	-	-	-	-	-	-
MTBE	mg/kg	Not Detected	0.00647952	1780	nv	nv	100	-	-	-	-	-	-	-	-	-	-
<b>PAHs</b>																	
Naphthalene	µg/kg	<1 - 27	10.590	270000	nv	nv	nv	5	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/kg	<1 - 69	457.063	2100000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/kg	<1 - 203	21000.000	34000000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Fluorene	µg/kg	<1 - 61	27200.000	69000000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/kg	<1 - 670	1860.000	34000000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/kg	<1 - 93	23.920	520000000	nv	nv	nv	3	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	<1 - 1205	86.809	3400000	nv	nv	nv	6	-	-	-	-	-	-	-	-	-
Pyrene	µg/kg	<1 - 914	155000.000	35000000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/kg	<1 - 1868	27.7307	340000	nv	nv	nv	17	-	-	-	-	-	-	-	-	-
Chrysene	µg/kg	<1 - 503	342.427	3500000	nv	nv	nv	2	-	-	-	-	-	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene	µg/kg	<1 - 1084	nv	350000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/kg	<1 - 515	82.888	35000	nv	nv	nv	4	-	-	-	-	-	-	-	-	-
Indeno(123cd)pyrene	µg/kg	<1 - 309	nv	350000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Dibenzo(ah)anthracene	µg/kg	<1 - 120	283.620	35000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	µg/kg	<1 - 385	nv	52000000	nv	nv	nv	-	-	-	-	-	-	-	-	-	-
Total 10 PAHs Dutch	µg/kg	<1 - 6420	nv	nv	nv	1000	40000	-	-	-	5	-	-	-	-	-	-

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert  
**Job Number** 49341640  
**Table 28:** Soil & Sediment Analysis Summary

Island Area	Mainland Area
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Analyte	Units	Range	Controlled Water GAC	Human Health GAC	EPA - 95 percentile	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value	No. of Results Exceeding Controlled Water GAC	No. of Results Exceeding Human Health GAC	No. of Results Exceeding EPA Value	No. of Results Exceeding Dutch S Value	No. of Results Exceeding Dutch I Value	No. of Results Exceeding Controlled Water GAC	No. of Results Exceeding Human Health GAC	No. of Results Exceeding EPA Value	No. of Results Exceeding Dutch S Value	No. of Results Exceeding Dutch I Value
<b>PCBs</b>	mg/kg	Not Detected	0.003	16.8	nv	0.02	1	-	-	-	-	-	-	-	-	-	-
<b>Metals</b>																	
Antimony	mg/kg	<1.5 - 6.1	0.226	15	1.54	3	15	37	-	37	14	-	15	-	15	8	-
Arsenic	mg/kg	<3 - 31	0.294	500	21.9	29	55	77	-	1	-	-	30	-	2	1	-
Barium	mg/kg	<6 - 354	4.11	28,000	454.5	160	625	86	-	-	-	-	32	-	-	2	-
Cadmium	mg/kg	<0.2 - 2.9	0.55	1,400	1.652	1	12	6	-	4	5	-	3	-	1	2	-
Chromium	mg/kg	<4.5 - 51	6.50	5,000	86.8	100	380	83	-	-	-	-	32	-	-	-	-
Cobalt	mg/kg	0.6 - 42	32.96	3,000	15.1	9	240	-	-	21	64	-	1	-	12	24	-
Copper	mg/kg	<6 - 1007	0.035	IR	45.9	36	190	87	-	4	13	-	33	-	3	5	-
Lead	mg/kg	<2 - 422	0.399	750	61.9	85	530	91	-	9	6	-	33	-	2	2	-
Mercury	mg/kg	<0.4 - 0.5	0.006	480	0.237	0	10	4	-	4	4	-	-	-	-	-	-
Molybdenum	mg/kg	<0.6 - 26	1.41	1,310	3.29	3	200	21	-	7	7	-	4	-	2	2	-
Nickel	mg/kg	<0.9 - 442	1.91	5,000	50	35	210	92	-	12	40	-	30	-	3	14	1
Selenium	mg/kg	Not Detected	0.05	8,000	2.67	1	100	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	3.8 - 1735	20	23,400	104.8	42	250	74	-	12	50	6	21	-	1	14	1
Zinc	mg/kg	<2.5 - 6318	0.289	IR	144.7	140	720	93	-	16	17	-	33	-	4	4	1
<b>Miscellaneous</b>																	
Total Phenols	mg/kg	<0.01 - 1.63	nv	nv	nv	0.05	40	-	-	-	10	-	-	-	-	5	-
Total Cyanide	mg/kg	Not Detected	50	nv	nv	1	20	-	-	-	-	-	-	-	-	-	-
Fluoride	mg/kg	<0.5 - 7.3	0.078	36,900	nv	nv	nv	23	-	-	-	-	4	-	-	-	-

Client  
Project  
Location  
Job Number  
Table 29:

ESB  
Phase 2 Environmental Investigation  
ESB Tarbert  
49341640  
Groundwater & Surface Water Analysis Summary

Island Area	Mainland Area
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Analyte	Units	Range	IGV	EQS	No. of Results Exceeding IGV	No. of Results Exceeding EQS	No. of Results Exceeding IGV	No. of Results Exceeding EQS
<b>Hydrocarbons</b>								
TPH	ug/l	<10 - 713	10	nv	1	-	1	-
Total Aliphatics (mineral oil)	ug/l	Not Detected	nv	300	-	-	-	-
Benzene	ug/l	Not Detected	1	nv	-	-	-	-
Toluene	ug/l	Not Detected	10	nv	-	-	-	-
Ethylbenzene	ug/l	Not Detected	10	nv	-	-	-	-
Xylene	ug/l	Not Detected	10	nv	-	-	-	-
MTBE	ug/l	Not Detected	30	nv	-	-	-	-
<b>PAHs</b>								
Naphthalene	ug/l	<0.01 - 0.122	1	nv	-	-	-	-
Acenaphthylene	ug/l	<0.01 - 0.053	nv	nv	-	-	-	-
Acenaphthene	ug/l	<0.01 - 0.295	nv	nv	-	-	-	-
Fluorene	ug/l	<0.01 - 0.242	nv	nv	-	-	-	-
Phenanthrene	ug/l	<0.01 - 0.641	nv	nv	-	-	-	-
Anthracene	ug/l	<0.01 - 0.151	10000	nv	-	-	-	-
Fluoranthene	ug/l	<0.01 - 0.077	1	nv	-	-	-	-
Pyrene	ug/l	<0.01 - 0.034	nv	nv	-	-	-	-
Benzo(a)anthracene	ug/l	<0.01 - 0.013	nv	nv	-	-	-	-
Chrysene	ug/l	<0.01 - 0.053	nv	nv	-	-	-	-
Benzo(b)+Benzo(k) fluoranthene	ug/l	Not Detected	0.05	nv	-	-	-	-
Benzo(a)pyrene	ug/l	Not Detected	0.01	nv	-	-	-	-
Indeno(123cd)pyrene	ug/l	Not Detected	0.05	nv	-	-	-	-
Dibenzo(ah)anthracene	ug/l	Not Detected	nv	nv	-	-	-	-
Benzo(ghi)perylene	ug/l	Not Detected	0.05	nv	-	-	-	-
Sum of 6 PAHs	ug/l	<0.01 - 0.015	0.10	0.2	-	-	-	-
<b>PCBs</b>								
	ug/l	<0.01 - 0.679	0.010	nv	1	-	-	-
<b>Metals</b>								
Antimony	mg/l	<0.001 - 0.003	nv	0.020	-	-	-	-
Arsenic	mg/l	<0.001 - 0.06	0.010	0.050	2	1	-	-
Barium	mg/l	<0.001 - 0.691	0.1	0.1	1	2	-	-
Cadmium	mg/l	<0.001 - 0.0034	0.01	0.01	-	-	-	-
Chromium	mg/l	<0.001 - 0.015	0.03	0.10	-	-	-	-
Cobalt	mg/l	<0.001 - 0.078	nv	nv	-	-	-	-
Copper	mg/l	<0.001 - 0.038	0.030	0.050	-	-	-	-
Lead	mg/l	<0.001 - 0.017	0.010	0.005	-	-	1	-
Mercury	mg/l	Not Detected	0.001	0.000	-	-	-	-
Molybdenum	mg/l	<0.001 - 0.098	nv	0.10	-	-	-	-
Nickel	mg/l	<0.001 - 0.065	0.02	0.10	1	-	2	-
Selenium	mg/l	<0.001 - 0.101	nv	0.02	-	5	-	2
Vanadium	mg/l	<0.001 - 1.411	nv	nv	-	-	-	-
Zinc	mg/l	<0.001 - 0.185	0.100	0.100	-	1	-	-

Client  
Project  
Location  
Job Number  
Table 29:

ESB  
Phase 2 Environmental Investigation  
ESB Tarbert  
49341640  
Groundwater & Surface Water Analysis Summary

Island Area	Mainland Area
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Analyte	Units	Range	IGV	EQS	No. of Results Exceeding IGV	No. of Results Exceeding EQS	No. of Results Exceeding IGV	No. of Results Exceeding EQS
<b>Anions and Cations</b>								
Aluminium	mg/l	<0.002 - 2.75	0.2	0.2000	-	-	1	-
Boron	mg/l	0.006 - 3.298	1.0	2.0	3	6	1	1
Calcium	mg/l	2.425 - 255.2	200	nv	1	-	-	-
Chloride	mg/l	1 - 16956	30.0	250.0	15	9	5	2
Fluoride	mg/l	<0.01 - 4.7	1	1	2	-	-	-
Iron	mg/l	<0.002 - 3.197	0.2	1	2	-	2	-
Potassium (Total as K)	mg/l	0.5 - 322.5	5	nv	12	-	2	-
Manganese	mg/l	<0.001 - 17.52	0.05	0.3	17	1	5	-
Sodium (Total as Na)	mg/l	4.9 - 7190	150	nv	10	-	1	-
Sulphate	mg/l	<3.0 - 1907	200	200	3	8	1	2
Alkalinity as CaCO3	mg/l	20 - 2260	nv	nv	-	-	-	-
Total Hardness as CaCO3	mg/l	7.0 - 3660	200	nv	10	-	2	-
Total Dissolved Solids (TDS)	mg/l	16 - 23300	1000	nv	7	-	2	-
<b>Nutrients</b>								
Ammonia*	mg/l	<0.2572 - 100.308	0.15	0.8	15	-	4	-
Nitrate	mg/l	<0.3 - 19.3	25	50	-	-	-	-
Nitrite	mg/l	<0.05 - 2.15	0.1	0.2	6	1	1	-
Phosphate	mg/l	<0.03 - 3.27	0.03	0.05	6	7	2	2
<b>Biological</b>								
Biological Oxygen Demand (BOD)	mg/l	<2.0 - 17	nv	4	-	2	-	1
Chemical Oxygen Demand (COD)	mg/l	<15 - 3908	nv	nv	-	-	-	-
Total coliforms	cfu/100ml	<1.0 - 350,000	0	5,000	11	-	2	-
Faecal coliforms	cfu/100ml	<1.0 - 2190000	0	1,000	9	2	2	-
<b>Miscellaneous</b>								
Electrical Conductivity	mS/cm	0.182 - 37	1	1	10	10	1	2
pH	pH Units	6.13 - 8.080	>6.5 - <9.5	>6-<9	3	-	1	-
Redox Potential	mV	0 - 200	nv	nv	-	-	-	-
Total Phenols	mg/l	<0.01 - 0.09	0.0005	0.0005	16	15	5	3
Total Cyanide	mg/l	Not Detected	0.01	0.01	-	-	-	-

**Client** ESB  
**Project** Additional Sampling Works  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 30 :** Sediment Analytical Results - Hydrocarbons

							Sediment	Sediment	Sediment
							Alcontrol	Alcontrol	Alcontrol
							SED26	SED27	SED28
							0.1	0.1	0.1
							27-Dec-08	27-Dec-08	27-Dec-08
Sample Type									
Laboratory									
Sample ID									
Depth (m)									
Date									
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	mg/kg	0.01	0.106	650	nv	nv	-	-	-
C7-C8	mg/kg	0.01	0.133	670	nv	nv	-	-	-
C8-C10	mg/kg	0.01	0.167	230	nv	nv	-	-	-
C10-C12	mg/kg	0.01	0.263	45,000	nv	nv	-	-	-
C12-C16	mg/kg	0.1	0.524	73,000	nv	nv	-	-	-
C16-C21	mg/kg	0.1	1.65	57,000	nv	nv	-	-	-
C21-C35	mg/kg	0.1	13.1	57,000	nv	nv	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-
<b>Aliphatics</b>									
C5-C6	mg/kg	0.01	0.093	370	nv	nv	-	-	-
C6-C8	mg/kg	0.01	0.429	740	nv	nv	-	-	-
C8-C10	mg/kg	0.01	3.32	230,000	nv	nv	-	-	-
C10-C12	mg/kg	0.01	26.2	150,000	nv	nv	-	-	-
C12-C16	mg/kg	0.1	523	180,000	nv	nv	-	-	-
C16-C21	mg/kg	0.1	65,800	IR	nv	nv	-	-	-
C21-C35	mg/kg	0.1	791,000	nv	nv	nv	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	<b>5000</b>	-	-	-
Total TPH	mg/kg	0.1	0.093	nv	nv	nv	-	-	-
<b>BTEX</b>									
Benzene	mg/kg	0.01	0.00156	1.5	0.01	<b>1</b>	-	-	-
Toluene	mg/kg	0.01	0.0162	150	0.01	<b>130</b>	-	-	-
Ethylbenzene	mg/kg	0.01	0.0467	48,000	0.03	<b>50</b>	-	-	-
Total Xylene	mg/kg	0.01	0.0458	320	0.1	<b>25</b>	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-
MTBE	mg/kg	0.01	0.00699	1,780	nv	<b>100</b>	-	-	-

**xx** Exceeds Human Health Generic Assessment Criteria  
**xx** Exceeds Controlled Waters Generic Assessment Criteria  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

**Client** ESB  
**Project** Additional Sampling Works  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 31 :** Sediment Analytical Results - PAHs

Sample Type							Sediment	Sediment	Sediment
Laboratory							Alcontrol	Alcontrol	Alcontrol
Sample ID							SED26	SED27	SED28
Depth (m)							0.1	0.1	0.1
Date							27-Dec-08	27-Dec-08	27-Dec-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
<b>PAHs</b>									
Naphthalene*	ug/kg	1	13.6	270,000	nv	nv	6	4	7
Acenaphthylene	ug/kg	1	588	2,100,000	nv	nv	6	6	5
Acenaphthene	ug/kg	1	56,700	34,000,000	nv	nv	24	26	26
Fluorene	ug/kg	1	35,100	69,000,000	nv	nv	7	6	5
Phenanthrene*	ug/kg	1	2,390	34,000,000	nv	nv	20	19	16
Anthracene*	ug/kg	1	30.8	52,000,000	nv	nv	7	6	6
Fluoranthene*	ug/kg	1	112	3,400,000	nv	nv	31	34	32
Pyrene	ug/kg	1	199,000	35,000,000	nv	nv	26	28	28
Benzo(a)anthracene*	ug/kg	1	35.7	340,000	nv	nv	37	45	31
Chrysene*	ug/kg	1	440	3,500,000	nv	nv	23	27	20
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	34	43	29
Benzo(a)pyrene*	ug/kg	1	106.7	35,000	nv	nv	15	19	11
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	14	15	15
Dibenzo(ah)anthracene	ug/kg	1	365	35,000	nv	nv	9	10	8
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	14	16	12
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	<b>40,000</b>	201	228	179
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	273	304	251

xx	Exceeds Human Health Generic Assessment Criteria
xx	Exceeds Controlled Waters Generic Assessment Criteria
MDL	Method Detection Limit
*	Included in Dutch sum of 10
-	Less than MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Additional Sampling Works  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 32 :** Sediment Analytical Results - PCBs

Sample Type	Laboratory	Sample ID	Depth (m)	Date	Sediment			Sediment			Sediment		
					Alcontrol	Alcontrol	Alcontrol	SED26	SED27	SED28	0.1	0.1	0.1
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value							
<b>PCBs</b>													
PCB Congener 28	mg/kg	0.001	0.043	16.8	nv	nv	-	-	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	0.052	16.8	nv	nv	-	-	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	0.353	16.8	nv	nv	-	-	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	2.34	6.82	nv	nv	-	-	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	0.8	16.8	nv	nv	-	-	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	0.535	16.8	nv	nv	-	-	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	1.020	16.8	nv	nv	-	-	-	-	-	-	-
PCB Total of 7 Congeners	mg/kg	0.001	0.004	16.8	0.02	<b>1</b>	-	-	-	-	-	-	-

xx	Exceeds Human Health Generic Assessment Criteria
xx	Exceeds Controlled Waters Generic Assessment Criteria
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Additional Sampling Works  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 33 :** Sediment Analytical Results - VOCs and SVOCs

Sample Type							Sediment	Sediment	Sediment
							Alcontrol	Alcontrol	Alcontrol
							SED26	SED27	SED28
							0.1	0.1	0.1
							27-Dec-08	27-Dec-08	27-Dec-08
Laboratory									
Sample ID									
Depth (m)									
Date									
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
VOCs	ug/kg	1	nv	nv	nv	nv	- *	- *	- *
SVOCs	ug/kg	100	nv	nv	nv	nv	- *	- *	- *
<b>VOC TICs</b>	ug/kg	1	nv	nv	nv	nv	none detected	none detected	none detected
<b>SVOC TICs</b>									
Sulfur	ug/kg	100	nv	nv	nv	nv	1,571	2,827	1,853
Butyl hexadecanoate	ug/kg	100	nv	nv	nv	nv	1,721	1,689	1,073
Octadecanoic acid, butyl ester	ug/kg	100	nv	nv	nv	nv	1,304	1,289	759
Hydrocarbons (C16-C26)	ug/kg	100	nv	nv	nv	nv	5,807	5,596	2,359

xx Exceeds Human Health Generic Assessment Criteria  
xx Exceeds Controlled Waters Generic Assessment Criteria  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual VOC and SVOC compounds were below the laboratory MDL

**Client:** ESB  
**Project:** Additional Sampling Works  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 34:** Groundwater Analytical Results: Hydrocarbons

Sample Type	Laboratory	Sample ID	Date	Groundwater	Groundwater	Groundwater	
				Alcontrol	Alcontrol	STL	
Parameters	UNITS	Alcontrol MDL	STL MDL	IGV			
<b>Hydrocarbons</b>							
<b>Aromatics</b>							
C6-C7	ug/l	10	5	nv	-	-	-
C7-C8	ug/l	10	5	nv	-	-	-
C8-C10	ug/l	10	10	nv	-	-	-
C10-C12	ug/l	10	10	nv	-	-	-
C12-C16	ug/l	10	20	nv	563	-	-
C16-C21	ug/l	10	20	nv	-	-	-
C21-C35	ug/l	10	50	nv	-	-	-
Total Aromatics	ug/l	10	50	nv	563	-	-
<b>Aliphatics</b>							
C5-C6	ug/l	10	nv	nv	-	-	nv
C6-C8	ug/l	10	10	nv	-	-	-
C8-C10	ug/l	10	10	nv	-	-	-
C10-C12	ug/l	10	10	nv	-	-	-
C12-C16	ug/l	10	20	nv	-	-	24
C16-C21	ug/l	10	20	nv	-	-	32
C21-C35	ug/l	10	50	nv	-	-	79
Total Aliphatics (MO)	ug/l	10	50	nv	-	-	135
Total TPH	ug/l	10	50	10	563	-	135
<b>BTEX</b>							
Benzene	ug/l	10	1	1	-	-	-
Toluene	ug/l	10	1	10	-	-	-
Ethylbenzene	ug/l	10	1	10	-	-	-
Total Xylene	ug/l	10	1	10	-	-	-
MTBE	ug/l	10	1	30	-	-	-
BTEX	ug/l	10	1	nv	-	-	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 nv No Value  
 MO Mineral Oil

**Client:** ESB  
**Project:** Additional Sampling Works  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 35:** Groundwater Analytical Results: PAHs

Sample Type	Laboratory	Sample ID	Date	Groundwater	Groundwater	Groundwater	
				Alcontrol	Alcontrol	STL	
Parameter	Units	Alcontrol MDL	STL MDL	IGV			
<b>PAHs</b>							
Naphthalene	ug/l	0.01	0.1	1	0.104	-	0.130
Acenaphthylene	ug/l	0.01	0.1	nv	0.033	-	-
Acenaphthene	ug/l	0.01	0.1	nv	0.143	-	-
Fluorene	ug/l	0.01	0.1	nv	0.153	-	-
Phenanthrene	ug/l	0.01	0.1	nv	0.207	-	-
Anthracene	ug/l	0.01	0.1	10000	0.028	-	-
Fluoranthene**	ug/l	0.01	0.1	1	-	-	-
Pyrene	ug/l	0.01	0.1	nv	-	-	-
Benzo(a)anthracene	ug/l	0.01	0.1	nv	-	-	-
Chrysene	ug/l	0.01	0.1	nv	-	-	-
Benzo(b)+Benzo(k)fluoranthene**	ug/l	0.01	0.1	0.05*	-	-	-
Benzo(a)pyrene**	ug/l	0.01	0.1	0.01	-	-	-
Indeno(123cd)pyrene**	ug/l	0.01	0.1	0.05	-	-	-
Dibenzo(ah)anthracene	ug/l	0.01	0.1	nv	-	-	-
Benzo(ghi)perylene**	ug/l	0.01	0.1	0.05	-	-	-
Sum 6 PAHs	ug/l	nv	nv	0.1	-	-	-
Total 16 EPA PAHs	ug/l	0.01	0.1	nv	0.668	-	0.130

IGV Interim Guideline Value for Groundwater

**xx** Exceeds IGV for Groundwater

MDL Method Detection Limit

- Less than the MDL

na Not Analysed

\* Laboratory results are presented as a sum of the 2 compounds. Consequently, the lower IGV of 0.05mg/l for benzo(k)fluoranthene is used

\*\* Included in sum of 6 PAHs

nv No Value

**Client:** ESB  
**Project:** Additional Sampling Works  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 36:** Groundwater Analytical Results: PCBs

Sample Type	Groundwater						
Laboratory	Alcontrol		STL		Groundwater		
Sample ID	BH318		BH318		STL		
Date	24-Oct-08		27-Dec-08		27-Dec-08		
Parameter	Units	Alcontrol MDL	STL MDL	IGV			
<b>PCBs</b>							
PCB Congener 28	ug/l	0.01	0.1	nv	0.037	-	-
PCB Congener 52	ug/l	0.01	0.1	nv	0.049	0.015	-
PCB Congener 101	ug/l	0.01	0.1	nv	0.083	0.042	-
PCB Congener 118	ug/l	0.01	0.1	nv	0.061	0.038	-
PCB Congener 153	ug/l	0.01	0.1	nv	0.036	0.026	-
PCB Congener 138	ug/l	0.01	0.1	nv	0.068	0.052	-
PCB Congener 180	ug/l	0.01	0.1	nv	-	-	-
PCB Total of 7 Congeners	ug/l	0.01	0.1	0.01	<b>0.333</b>	<b>0.174</b>	-
PCB Total as Aroclors	ug/l	nv	1	nv	nv	nv	1.4*

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 nv No Value  
 \* Contamination found was consistent with being Aroclor 1254

**Client:** ESB  
**Project:** Additional Sampling Works  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 37:** Groundwater Analytical Results: VOCs

Sample Type	Laboratory	Sample ID	Date	Groundwater			Groundwater			Groundwater		
				Alcontrol	Alcontrol	STL	Alcontrol	Alcontrol	STL	Alcontrol	Alcontrol	STL
				BH318	BH318	BH318	BH318	BH318	BH318	BH318	BH318	BH318
				24-Oct-08	27-Dec-08	27-Dec-08	24-Oct-08	27-Dec-08	27-Dec-08	24-Oct-08	27-Dec-08	27-Dec-08
Parameters	Units	Alcontrol MDL	STL MDL	IGV								
Dichlorodifluoromethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Chloromethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Vinyl Chloride	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Bromomethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Chloroethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Trichlorofluoromethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,1-Dichloroethene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Carbon Disulphide	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Dichloromethane	ug/l	1.0	1.0	10	-	-	-	-	-	-	-	-
Tert-butyl methyl ether	ug/l	1.0	1.0	30	-	-	-	-	-	-	-	-
Trans-1,2-Dichloroethene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,1-Dichloroethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Cis-1,2-Dichloroethene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
2,2-Dichloropropane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Bromochloromethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Chloroform	ug/l	1.0	1.0	12	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	ug/l	1.0	1.0	500	-	-	-	-	-	-	-	-
1,1-Dichloropropene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Carbontetrachloride	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,2-Dichloroethane	ug/l	1.0	1.0	3	-	-	-	-	-	-	-	-
Benzene	ug/l	1.0	1.0	1	-	-	-	-	-	-	-	-
Trichloroethene	ug/l	1.0	1.0	70	-	-	-	-	-	-	-	-
1,2-Dichloropropane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Dibromomethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Bromodichloromethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Cis-1,3-Dichloropropene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Toluene	ug/l	1.0	1.0	10	-	-	-	-	-	-	-	-
Trans-1,3-Dichloropropene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,3-Dichloropropane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Tetrachloroethene	ug/l	1.0	1.0	40	-	-	-	-	-	-	-	-
Dibromochloromethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,2-Dibromoethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Chlorobenzene	ug/l	1.0	1.0	1	-	-	-	-	-	-	-	-
1,1,1,2-tetrachloroethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Ethylbenzene	ug/l	1.0	1.0	10	-	-	-	-	-	-	-	-
p/m-Xylene	ug/l	1.0	1.0	10	-	-	-	-	-	-	-	-
o-Xylene	ug/l	1.0	1.0	10	-	-	-	-	-	-	-	-
Styrene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Bromoform	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Isopropylbenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Bromobenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Propylbenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
2-Chlorotoluene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
4-Chlorotoluene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Tert-Butylbenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
Sec-Butylbenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
4-Isopropyltoluene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
n-Butylbenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	ug/l	1.0	1.0	10	-	-	-	-	-	-	-	-
1,2-Dibromo-3-Chloropropane	ug/l	1.0	2.0	nv	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	ug/l	1.0	1.0	0.4	-	-	-	-	-	-	-	-
Hexachlorobutadiene	ug/l	1.0	1.0	0.1	-	-	-	-	-	-	-	-
Naphthalene	ug/l	1.0	1.0	1	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	ug/l	1.0	1.0	nv	-	-	-	-	-	-	-	-
<b>VOC TICs</b>	ug/l	nv	nv	nv	nd	nd	nd	nd	nd	nd	nd	nd

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 nd Not Detected

Client: ESB  
 Project: Additional Sampling Works  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 38: Groundwater Analytical Results: SVOCs

Sample Type						Groundwater	Groundwater	Groundwater		
	Laboratory						Alcontrol	Alcontrol	STL	
		Sample ID						BH318	BH318	BH318
			Date						24-Oct-08	27-Dec-08
Parameters	Units	Alcontrol MDL	STL MDL	IGV						
Phenol	ug/l	1	2	0.5	-	-	-			
2-Chlorophenol	ug/l	1	1	200	-	-	-			
2-Methylphenol	ug/l	1	1	nv	-	-	-			
4-Methylphenol	ug/l	1	1	nv	-	-	-			
2-Nitrophenol	ug/l	1	1	nv	-	-	-			
4-Nitrophenol	ug/l	1	5	nv	-	-	-			
2,4-Dichlorophenol	ug/l	1	1	nv	-	-	-			
2,4-Dimethylphenol	ug/l	1	2	nv	-	-	-			
4-Chloro-3-methylphenol	ug/l	1	1	nv	-	-	-			
2,4,6-Trichlorophenol	ug/l	1	1	200	-	-	-			
2,4,5-Trichlorophenol	ug/l	1	1	nv	-	-	-			
Pentachlorophenol	ug/l	1	5	2	-	-	-			
1,3-Dichlorobenzene	ug/l	1	1	nv	-	-	-			
1,4-Dichlorobenzene	ug/l	1	1	10	-	-	-			
1,2-Dichlorobenzene	ug/l	1	1	10	-	-	-			
1,2,4-Trichlorobenzene	ug/l	1	1	0.4	-	-	-			
Nitrobenzene	ug/l	1	1	10	-	-	-			
Azobenzene	ug/l	1	1	nv	-	-	-			
Hexachlorobenzene	ug/l	1	1	0.03	-	-	-			
Naphthalene	ug/l	1	1	1	-	-	-			
Acenaphthylene	ug/l	1	1	nv	-	-	-			
Acenaphthene	ug/l	1	1	nv	-	-	-			
Fluorene	ug/l	1	1	nv	-	-	-			
Phenanthrene	ug/l	1	1	nv	-	-	-			
Anthracene	ug/l	1	1	10000	-	-	-			
Fluoranthrene	ug/l	1	1	1	-	-	-			
Pyrene	ug/l	1	1	nv	-	-	-			
Benzo(a)anthracene	ug/l	1	1	nv	-	-	-			
Chrysene	ug/l	1	1	nv	-	-	-			
Benzo(b)fluoranthrene	ug/l	1	1	0.5	-	-	-			
Benzo(k)fluoranthrene	ug/l	1	1	0.05	-	-	-			
Benzo(a)pyrene	ug/l	1	1	0.01	-	-	-			
Indeno(1,2,3-cd)pyrene	ug/l	1	1	0.05	-	-	-			
Dibenzo(a,h)anthracene	ug/l	1	1	nv	-	-	-			
Benzo(ghi)perylene	ug/l	1	1	0.05	-	-	-			
2-Chloronaphthalene	ug/l	1	1	nv	-	-	-			
2-Methylnaphthalene	ug/l	1	1	nv	-	-	-			
Carbazole	ug/l	1	1	nv	-	-	-			
Isophorone	ug/l	1	1	nv	-	-	-			
Dibenzofuran	ug/l	1	1	nv	-	-	-			
Dimethyl phthalate	ug/l	1	1	nv	-	-	-			
Diethyl phthalate	ug/l	1	3	10	-	-	-			
Di-n-butylphthalate	ug/l	1	10	2	-	-	-			
Di-n-octylphthalate	ug/l	1	1	0.1	-	-	-			
Bis(2-ethylhexyl)phthalate	ug/l	1	10	8	1	-	-			
Butylbenzylphthalate	ug/l	1	1	1	-	-	-			
4-Chloroaniline	ug/l	1	1	nv	-	-	-			
2-Nitroaniline	ug/l	1	1	10	-	-	-			
3-Nitroaniline	ug/l	1	1	10	-	-	-			
4-Nitroaniline	ug/l	1	1	nv	-	-	-			
2,4-Dinitrotoluene	ug/l	1	1	nv	-	-	-			
2,6-Dinitrotoluene	ug/l	1	1	nv	-	-	-			
Bis(2-chloroethyl)ether	ug/l	1	1	30	-	-	-			
4-Bromophenylphenylether	ug/l	1	1	nv	-	-	-			
4-Chlorophenylphenylether	ug/l	1	1	40	-	-	-			
Hexachloroethane	ug/l	1	1	10	-	-	-			
Hexachlorobutadiene	ug/l	1	1	0.1	-	-	-			
Hexachlorocyclopentadiene	ug/l	1	1	nv	-	-	-			
Bis(2-chloroethoxy)methane	ug/l	1	1	10	-	-	-			
N-nitrosodi-n-propylamine	ug/l	1	1	nv	-	-	-			
<b>SVOC-TIC</b>										
Hydrocarbons (C20-C26)	ug/l	nv	nv	nv	nd	5.6	nd			
1-(4-phenylcyclohexyl)-1-hexanone	ug/l	nv	nv	nv	9.8	nd	nd			
Ethanol	ug/l	nv	nv	nv	1.66	nd	nd			
1,6-Dimethylnaphthalene	ug/l	nv	nv	nv	2.14	nd	nd			
Butyl Octadecanoate	ug/l	nv	nv	nv	6.9	nd	nd			
Tetracosane	ug/l	nv	nv	nv	1.1	nd	nd			

IGV - Interim Guideline Value for Groundwater

**xx - Exceeds IGV for Groundwater**

MDL - Method Detection Limit

- Less than the MDL

na - Not Analysed

nv - No Value

nd - Not Detected

NDP - No Determination Possible

**Client:** ESB  
**Project:** Additional Sampling Works  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 39:** Surface Water Analytical Results - Hydrocarbons

Sample Type					Surface Water
Laboratory					Alcontrol
Sample ID					SW43
Date					27-Dec-08
Parameters	UNITS	MDL	EQS		
<b>Hydrocarbons</b>					
<b>Aromatics</b>					
C6-C7	ug/L	10	nv	-	-
C7-C8	ug/L	10	nv	-	-
C8-C10	ug/L	10	nv	-	-
C10-C12	ug/L	10	nv	-	-
C12-C16	ug/L	10	nv	-	-
C16-C21	ug/L	10	nv	-	-
C21-C35	ug/L	10	nv	-	-
Total Aromatics	ug/L	nv	nv	-	-
<b>Aliphatics</b>					
C5-C6	ug/L	10	nv	-	-
C6-C8	ug/L	10	nv	-	-
C8-C10	ug/L	10	nv	-	-
C10-C12	ug/L	10	nv	-	-
C12-C16	ug/L	10	nv	-	-
C16-C21	ug/L	10	nv	-	-
C21-C35	ug/L	10	nv	-	-
Total Aliphatics (MO)	ug/L	10	300	-	-
Total TPH	ug/L	nv	nv	-	-
<b>BTEX</b>					
Benzene	ug/L	10	10	-	-
Toluene	ug/L	10	10	-	-
Ethylbenzene	ug/L	10	10	-	-
Total Xylene	ug/L	10	10	-	-
MTBE	ug/L	10	nv	-	-
BTEX	ug/L	nv	nv	-	-

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Additional Sampling Works  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 40:** Surface Water Analytical Results - PAHs

Sample Type	Surface Water			
Laboratory	Alcontrol			
Sample ID	SW43			
Date	27-Dec-08			
Parameters	UNITS	MDL	EQS	
<b>PAHs</b>				
Naphthalene	ug/L	0.01	nv	-
Acenaphthylene	ug/L	0.01	nv	-
Acenaphthene	ug/L	0.01	nv	-
Fluorene	ug/L	0.01	nv	-
Phenanthrene	ug/L	0.01	nv	-
Anthracene	ug/L	0.01	nv	-
Fluoranthene*	ug/L	0.01	nv	-
Pyrene	ug/L	0.01	nv	-
Benzo(a)anthracene	ug/L	0.01	nv	-
Chrysene	ug/L	0.01	nv	-
Benzo(b)+Benzo(k)fluoranthene*	ug/L	0.01	nv	-
Benzo(a)pyrene*	ug/L	0.01	nv	-
Indeno(123cd)pyrene*	ug/L	0.01	nv	-
Dibenzo(ah)anthracene	ug/L	0.01	nv	-
Benzo(ghi)perylene*	ug/L	0.01	nv	-
Sum 6 PAHs	ug/L	nv	0.2	-
Total 16 EPA PAHs	ug/L	nv	nv	-

EQS	EPA Proposed Environmental Quality Standards for Surface Water
xx	Exceeds EQS for Surface Waters
MDL	Method Detection Limit
-	Less than the MDL
na	Not Analysed
nv	No Value

**Client:** ESB  
**Project:** Additional Sampling Works  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 41:** Surface Water Analytical Results: PCBs

Sample Type				Surface Water
Laboratory				Alcontrol
Sample ID				SW43
Date				27-Dec-08
Parameter	Units	MDL	EQS	
<b>PCBs</b>				
PCB Congener 28	ug/l	0.01	nv	-
PCB Congener 52	ug/l	0.01	nv	-
PCB Congener 101	ug/l	0.01	nv	-
PCB Congener 118	ug/l	0.01	nv	-
PCB Congener 153	ug/l	0.01	nv	-
PCB Congener 138	ug/l	0.01	nv	-
PCB Congener 180	ug/l	0.01	nv	-
PCB Total of 7 Congeners	ug/l	0.01	1	-

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Additional Sampling Works  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 42:** Surface Water Analytical Results: VOCs

Sample Type					Surface Water
Laboratory					Alcontrol
Sample ID					SW43
Date					27-Dec-08
Parameters	Units	MDL	EQS		
Dichlorodifluoromethane	ug/l	1.0	nv	-	
Chloromethane	ug/l	1.0	nv	-	
Vinyl Chloride	ug/l	1.0	10	-	
Bromomethane	ug/l	1.0	nv	-	
Chloroethane	ug/l	1.0	nv	-	
Trichlorofluoromethane	ug/l	1.0	nv	-	
1,1-Dichloroethene	ug/l	1.0	nv	-	
Carbon Disulphide	ug/l	1.0	nv	-	
Dichloromethane	ug/l	1.0	10	-	
Tert-butyl methyl ether	ug/l	1.0	nv	-	
Trans-1,2-Dichloroethene	ug/l	1.0	nv	-	
1,1-Dichloroethane	ug/l	1.0	nv	-	
Cis-1,2-Dichloroethene	ug/l	1.0	nv	-	
2,2-Dichloropropane	ug/l	1.0	nv	-	
Bromochloromethane	ug/l	1.0	nv	-	
Chloroform	ug/l	1.0	12	-	
1,1,1-Trichloroethane	ug/l	1.0	500	-	
1,1-Dichloropropene	ug/l	1.0	nv	-	
Carbontetrachloride	ug/l	1.0	12	-	
1,2-Dichloroethane	ug/l	1.0	nv	-	
Benzene	ug/l	1.0	10	-	
Trichloroethene	ug/l	1.0	nv	-	
1,2-Dichloropropane	ug/l	1.0	nv	-	
Dibromomethane	ug/l	1.0	nv	-	
Bromodichloromethane	ug/l	1.0	nv	-	
Cis-1,3-Dichloropropene	ug/l	1.0	nv	-	
Toluene	ug/l	1.0	10	-	
Trans-1,3-Dichloropropene	ug/l	1.0	nv	-	
1,1,2-Trichloroethane	ug/l	1.0	nv	-	
1,3-Dichloropropane	ug/l	1.0	nv	-	
Tetrachloroethene	ug/l	1.0	nv	-	
Dibromochloromethane	ug/l	1.0	nv	-	
1,2-Dibromoethane	ug/l	1.0	nv	-	
Chlorobenzene	ug/l	1.0	1	-	
1,1,1,2-tetrachloroethane	ug/l	1.0	nv	-	
Ethylbenzene	ug/l	1.0	10	-	
p/m-Xylene	ug/l	1.0	10	-	
o-Xylene	ug/l	1.0	10	-	
Styrene	ug/l	1.0	nv	-	
Bromoform	ug/l	1.0	nv	-	
Isopropylbenzene	ug/l	1.0	nv	-	
1,1,2,2-Tetrachloroethane	ug/l	1.0	nv	-	
1,2,3-Trichloropropane	ug/l	1.0	nv	-	
Bromobenzene	ug/l	1.0	nv	-	
Propylbenzene	ug/l	1.0	nv	-	
2-Chlorotoluene	ug/l	1.0	nv	-	
1,3,5-Trimethylbenzene	ug/l	1.0	nv	-	
4-Chlorotoluene	ug/l	1.0	nv	-	
Tert-Butylbenzene	ug/l	1.0	nv	-	
1,2,4-Trimethylbenzene	ug/l	1.0	nv	-	
Sec-Butylbenzene	ug/l	1.0	nv	-	
4-Isopropyltoluene	ug/l	1.0	nv	-	
1,3-Dichlorobenzene	ug/l	1.0	nv	-	
1,4-Dichlorobenzene	ug/l	1.0	nv	-	
n-Butylbenzene	ug/l	1.0	nv	-	
1,2-Dichlorobenzene	ug/l	1.0	10	-	
1,2-Dibromo-3-Chloropropan	ug/l	1.0	nv	-	
1,2,4-Trichlorobenzene	ug/l	1.0	0.4	-	
Hexachlorobutadiene	ug/l	1.0	0.1	-	
Naphthalene	ug/l	1.0	nv	-	
1,2,3-Trichlorobenzene	ug/l	1.0	nv	-	
VOC TICs	ug/l	nv	nv	nd	

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

Client: ESB  
 Project: Additional Sampling Works  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 43: Surface Water Analytical Results: SVOCs

Sample Type					Surface Water
					Alcontrol
Laboratory					SW43
Sample ID					27-Dec-08
Date					
Parameters	Units	MDL	EQS		
Phenol	ug/l	1	0.5	-	-
2-Chlorophenol	ug/l	1	nv	-	-
2-Methylphenol	ug/l	1	nv	-	-
4-Methylphenol	ug/l	1	nv	-	-
2-Nitrophenol	ug/l	1	nv	-	-
4-Nitrophenol	ug/l	1	nv	-	-
2,4-Dichlorophenol	ug/l	1	nv	-	-
2,4-Dimethylphenol	ug/l	1	nv	-	-
4-Chloro-3-methylphenol	ug/l	1	nv	-	-
2,4,6-Trichlorophenol	ug/l	1	0	-	-
2,4,5-Trichlorophenol	ug/l	1	nv	-	-
Pentachlorophenol	ug/l	1	2	-	-
1,3-Dichlorobenzene	ug/l	1	nv	-	-
1,4-Dichlorobenzene	ug/l	1	nv	-	-
1,2-Dichlorobenzene	ug/l	1	10	-	-
1,2,4-Trichlorobenzene	ug/l	1	0.4	-	-
Nitrobenzene	ug/l	1	nv	-	-
Azobenzene	ug/l	1	nv	-	-
Hexachlorobenzene	ug/l	1	0.03	-	-
Naphthalene	ug/l	1	nv	-	-
Acenaphthylene	ug/l	1	nv	-	-
Acenaphthene	ug/l	1	nv	-	-
Fluorene	ug/l	1	nv	-	-
Phenanthrene	ug/l	1	nv	-	-
Anthracene	ug/l	1	nv	-	-
Fluoranthrene	ug/l	1	nv	-	-
Pyrene	ug/l	1	nv	-	-
Benzo(a)anthracene	ug/l	1	nv	-	-
Chrysene	ug/l	1	nv	-	-
Benzo(b)fluoranthrene	ug/l	1	nv	-	-
Benzo(k)fluoranthrene	ug/l	1	nv	-	-
Benzo(a)pyrene	ug/l	1	nv	-	-
Indeno(1,2,3-cd)pyrene	ug/l	1	nv	-	-
Dibenzo(a,h)anthracene	ug/l	1	nv	-	-
Benzo(ghi)perylene	ug/l	1	nv	-	-
2-Chloronaphthalene	ug/l	1	nv	-	-
2-Methylnaphthalene	ug/l	1	nv	-	-
Carbazole	ug/l	1	nv	-	-
Isophorone	ug/l	1	nv	-	-
Dibenzofuran	ug/l	1	nv	-	-
Dimethyl phthalate	ug/l	1	nv	-	-
Diethyl phthalate	ug/l	1	nv	-	-
Di-n-butylphthalate	ug/l	1	2	-	-
Di-n-octylphthalate	ug/l	1	nv	-	-
Bis(2-ethylhexyl)phthalate	ug/l	1	8	-	-
Butylbenzylphthalate	ug/l	1	nv	-	-
4-Chloroaniline	ug/l	1	nv	-	-
2-Nitroaniline	ug/l	1	nv	-	-
3-Nitroaniline	ug/l	1	nv	-	-
4-Nitroaniline	ug/l	1	nv	-	-
2,4-Dinitrotoluene	ug/l	1	nv	-	-
2,6-Dinitrotoluene	ug/l	1	nv	-	-
Bis(2-chloroethyl)ether	ug/l	1	nv	-	-
4-Bromophenylphenylether	ug/l	1	nv	-	-
4-Chlorophenylphenylether	ug/l	1	nv	-	-
Hexachloroethane	ug/l	1	nv	-	-
Hexachlorobutadiene	ug/l	1	0.1	-	-
Hexachlorocyclopentadiene	ug/l	1	nv	-	-
Bis(2-chloroethoxy)methane	ug/l	1	nv	-	-
N-nitrosodi-n-propylamine	ug/l	1	nv	-	-
SVOC-TIC	ug/l	nv	nv	-	nd

EQS

xx

MDL

-

na

nv

EPA Proposed Environmental  
 Quality Standards for Surface  
 Waters  
 Method Detection Limit  
 Less than the MDL  
 Not Analysed  
 No Value

# Appendix A - Photographs



Location No: 1 North



Location No: 1 West



Location No: 2 East



Location No: 3 East



Location No: 4 South west



Location No: 5 South west



Location No: 5 South



Location No: 5 South east



Location No: 6 East



Location No: 7 South east



Location No: 8 West



Location No: 9 East



Location No: 9 West



Location No: 10 West



Location No: 11 East



Location No: 11 East



Location No: 11 West



Location No: 11 South west



Location No: 11 North west.



Location No: 11 South east



Location No: 12 North.



Location No: 12 East.



Location No: 12 West.



Location No: 12 West foreshore.



Location No: 13 East.



Location No: 13 South east.



Location No: 14 North west



Location No: 15 North east



Location No: 16 East



Location No: 17 North west



Location No: 18 North east



Location No: 19 North west



Location No: 19 South east



Location No: 20 South east



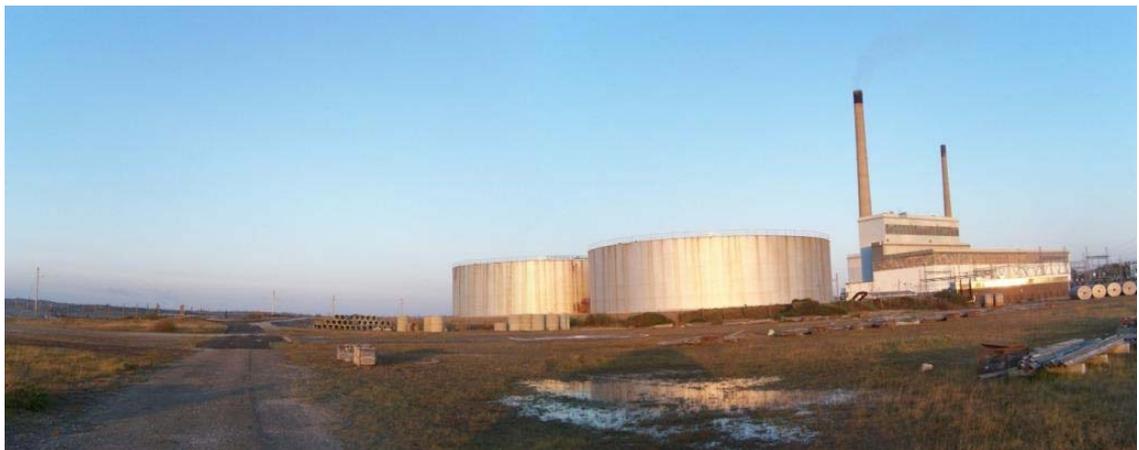
Location No: 21 North east



Location No: 21 South east



Location No: 22 East



Location No: 23 East



Location No: 24 South



Location No: 24 South



Location No: 24 South west



Location No: 24 West



Location No: 25 East



Location No: 25 South east



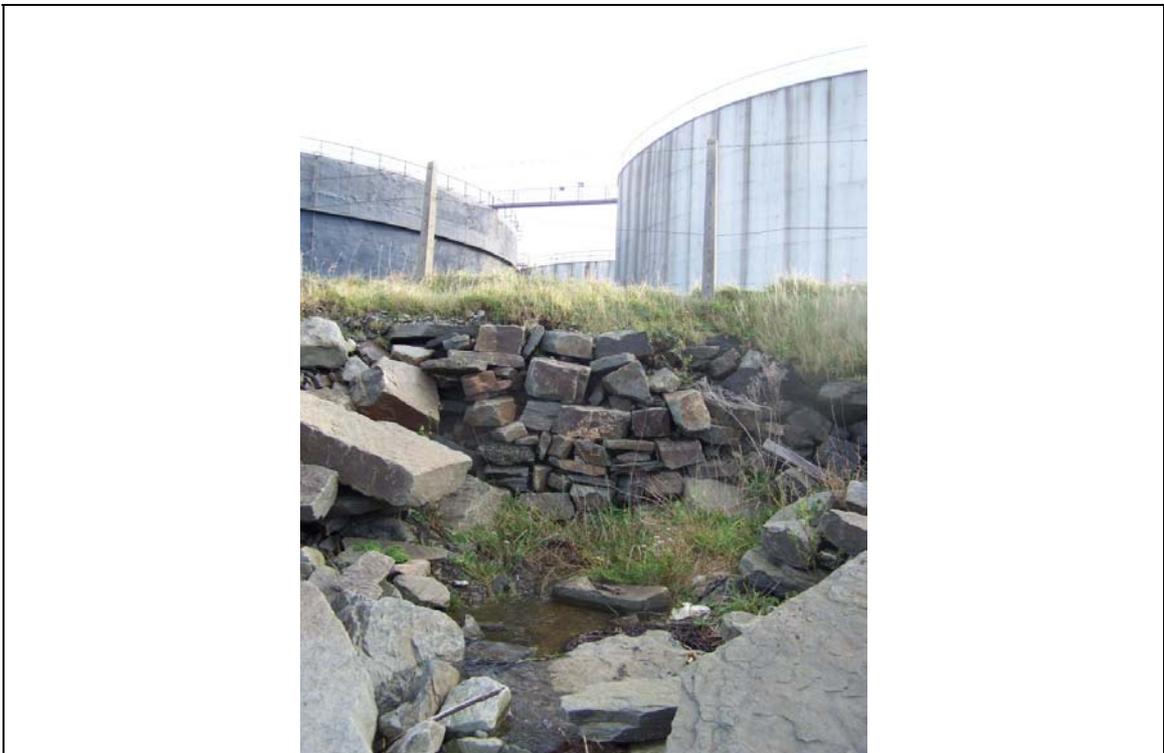
Location No: 26 North



Location No: 27 East



Location No: 28 East



Location No: 28 South



Location No: 28 West



Location No: 29 West



Location No: 30 East



Location No: 31 South



Location No: 31 North east



Location No: 32 South east



Location No: 32 South



Location No: 32 South west



Location No: 33 South



Location No: 34 South east



Location No: 34 South west



Location No: 34 South



Location No: 35 South



Location No: 35 South west



Location No: 36 South west



Location No: 36 South



Location No: 36 South



Location No: 37 West



Location No: 38 South



Location No: 38 South west



Location No: 39 South east



Location No: 39 North



Location No: 40 South east



Location No: 41 North west



Location No: 41 East



Location No: 42 North west



Location No: 42 North east



Location No: 43 South east



Location No: 43 North west



Location No: 43 South west



Location No: 44 South east



Location No: 44 West



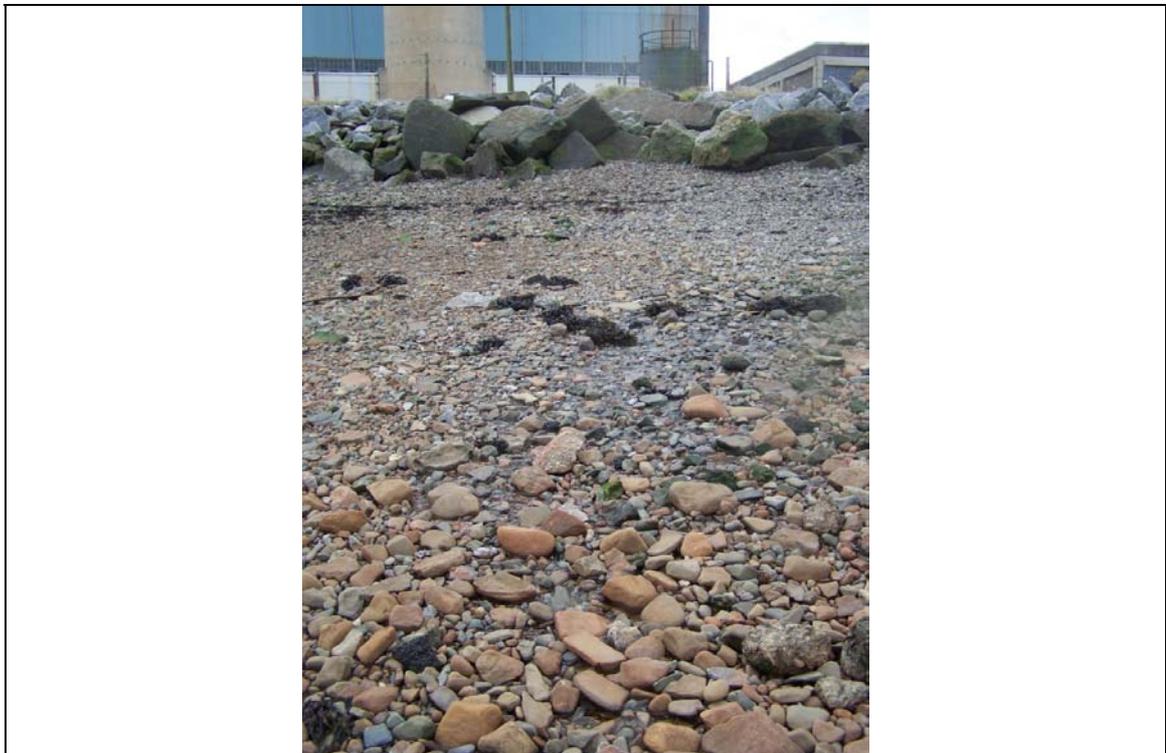
Location No: 45 South east



Location No: 45 North west



Location No: 45 South west



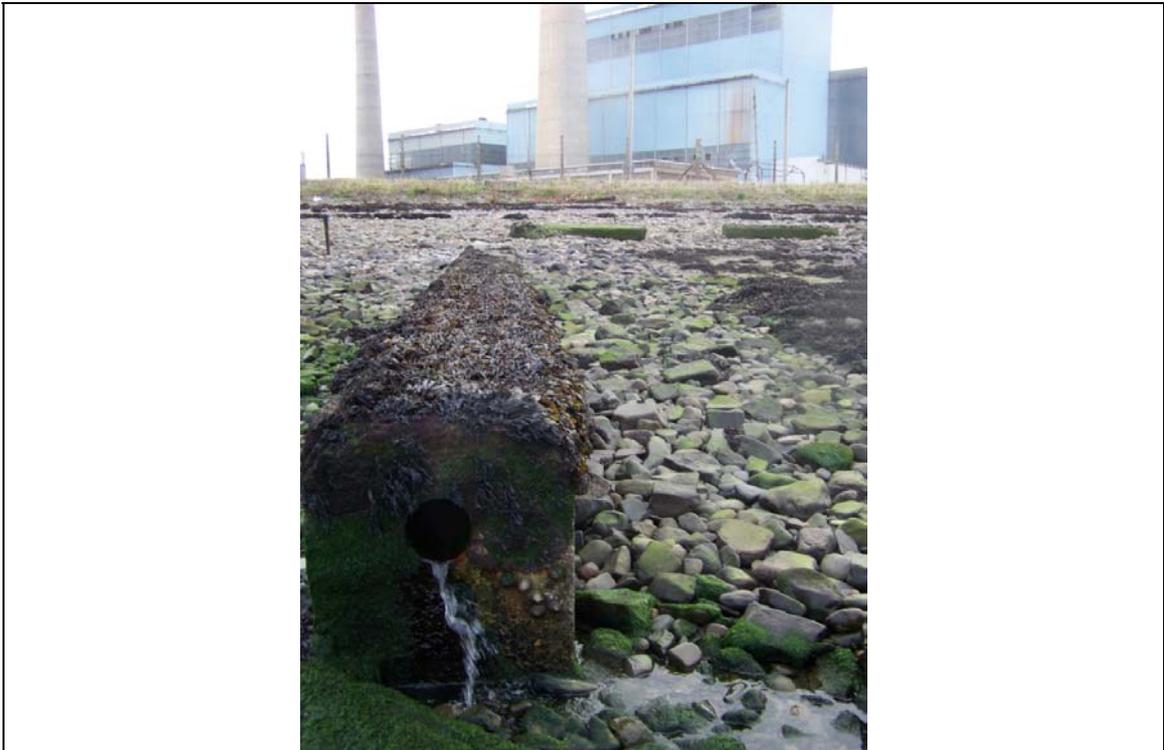
Location No: 45 South west



Location No: 45 South west



Location No: 45 West



Location No: 46 South



Location No: 47 North west



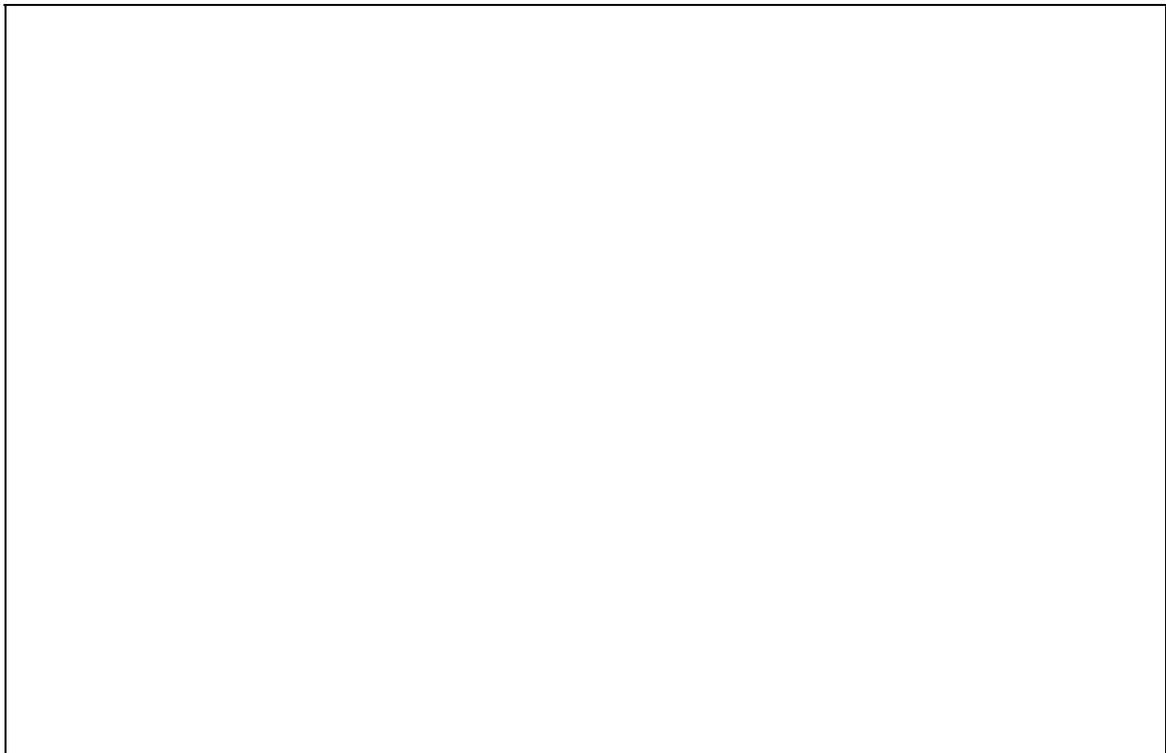
Location No: 47 South west



Location No: 47 West



Location No: 48 South east



Location No: \_\_\_\_\_

## Panoramic Elevated Photographs



Location No: 2 Northward View showing CW lagoon, island HFO Tank Farm and station buildings



Location No: 3 Northward View showing island HFO tankfarm

# Panoramic Elevated Photographs



Location No: 3 Southeast View showing 220kV compound



Location No: 3 Northwest view showing island HFO tankfarm and 220kV compound

## Panoramic Elevated Photographs



Location No: 5 South east view showing transformer and workshop



Location No: 5 South west view showing cooling water race and 220kV compound

## Panoramic Elevated Photographs



Location No: 5 North west view



Location No: 6 North west view showing 110kV compound

# Panoramic Elevated Photographs



Location No: 6 Westward view showing 110kV compound and adjacent land

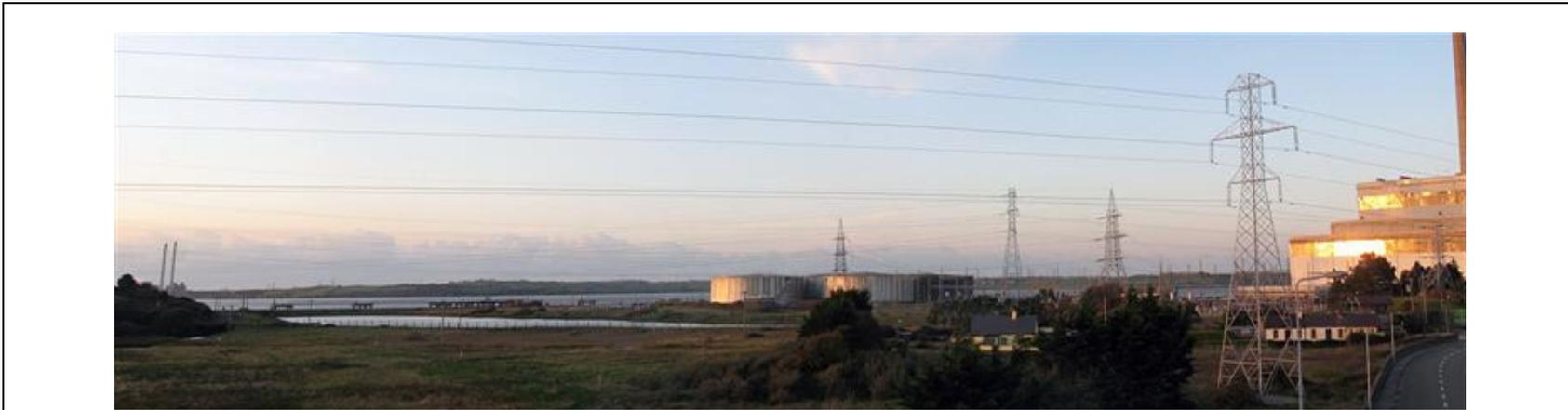


Location No: 6 Southward view

# Panoramic Elevated Photographs



Location No:         6         North east view showing yard and mound to south east of 110kV compound



Location No:         7         North west view showing old car park area

# Panoramic Elevated Photographs



Location No: 7 North view showing station building and road to ferry



Location No: \_\_\_\_\_

## **Appendix B - Investigation Logs**



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station		Client Electricity Supply Board		BOREHOLE No <b>BH301</b>
Job No 49341640	Date Start Date End Date 06-10-08	Ground Level (m) 4.12	Co-Ordinates () E 107,576.00 N 149,429.00	
Contractor AQS		Method / Plant Used Vac.Ex.		Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Installation / Backfill	
				Legend	Depth (Thickness)	DESCRIPTION		COMMENTS
0.5	BH301_0.5	0.4		Legend	0.05	TARMAC	NEC. No ACM	
					0.10 (0.75)	Compacted yellow brown Sand & Gravel		
					0.85	Compacted grey Gravel (quarried stone).		
1.0						Grey SHALE (weathered bedrock).		
1.5						From 0.95m rotary rig in use.		
2.0								
2.5								
3.0								
3.5								
4.0					(6.15)			
4.5								
5.0								
5.5								
6.0								
6.5								
7.0					7.00			
						EOH @ 7.0m		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack riser Cement seal riser Filter pack screen		<b>LEGEND</b> Tarmac Shale Made Ground Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>  
<b>SAMPLE TYPE DETAILS</b>		Logged By <b>K Reid</b> Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH302</b>
Job No 49341640	Date Start Date End Date 06-10-08	Ground Level (m)	Co-Ordinates () E 107,686.00 N 149,409.00		
Contractor AQS (1.0m), Glovers (1.5m)			Method / Plant Used Vac.Ex./Terrier		Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Installation / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
0.5 1.0 1.5	BH302_0.5	0.2		0.05	TARMAC	NEC. No ACM	
				0.10	Compacted light grey sand & gravel Fill		
	0.35	Compacted yellow brown sand & gravel Fill (quarried stone)					
	(0.85)	Compacted grey sand & gravel Fill with occasional metal & plastic fragments					
	1.20	Stiff grey sandy gravelly CLAY					
	1.40	SHALE (weathered bedrock)					
				1.50	EOH @ 1.5m due to refusal on bedrock		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<p><b>WELL INSTALLATION DETAILS</b></p>   <p><b>SAMPLE TYPE DETAILS</b></p>	<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li> Tarmac</li> <li> Made Ground</li> <li> Shale</li> <li> Fill (made ground)</li> <li> Sandy Gravelly CLAY</li> <li> Groundwater Table</li> <li> Water Strike</li> </ul> <p>bgl = Below Ground Level</p>	<p><b>GENERAL REMARKS</b></p>   
<p>Logged By <b>K Reid</b></p>		<p>Approved By <b>D Mullan</b></p>



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH303</b>
Job No 49341640	Date Start Date End Date 06-10-08	Ground Level (m)	Co-Ordinates () E 107,663.00 N 149,384.00		
Contractor AQS		Method / Plant Used Vac.Ex.			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	BH303_0.5	0.1			0.05	TARMAC	NEC. No ACM.
					0.30	Compacted light brown sand & gravel Fill	
					(0.55)	Compacted grey sand & gravel Fill	
					0.85	Grey SHALE (weathered bedrock)	
					0.90	EOH @ 0.9m	

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		Tarmac Shale Fill (made ground)	Groundwater Table Water Strike bgl = Below Ground Level		
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station		Client Electricity Supply Board		BOREHOLE No <b>BH304</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m)	Co-Ordinates () E 107,515.00 N 149,489.00	
Contractor AQS		Method / Plant Used Vac.Ex.		Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5 1.0	BH304_0.5	0.2			0.05	TARMAC	NEC. No ACM.
					0.15 (0.60)	compacted light grey sand & gravel Fill	
					0.75	Compacted grey sand & gravel Fill	
					1.00	Grey SHALE (weathered bedrock)	
						EOH @ 1.0m	

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		Tarmac Fill (made ground) Shale Groundwater Table Water Strike bgl = Below Ground Level			
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH305</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m)	Co-Ordinates () E 107,457.00 N 149,488.00		
Contractor AQS		Method / Plant Used Vac.Ex.			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	BH305_0.5	0.0			0.05	Loose Gravel	NEC. No ACM.
					(0.70)	Compacted grey sand & gravel Fill	
					0.75	EOH @ 0.75m due to suspected electrical cables.	

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		Made Ground       Fill (made ground)	Groundwater Table       Water Strike bgl = Below Ground Level		
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH306</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m) 6.68	Co-Ordinates () E 107,839.00 N 149,401.00		
Contractor AQS		Method / Plant Used Vac.Ex.			Sheet 1 of 2

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Installation / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
0.5	BH306_0.4	0.1				Brown CLAY with occasional bolders	
1.0	BH306_1.0	0.2					
5.60					(5.60)		
5.60					5.60	ROCK (SHALE)	
4.40					(4.40)		
10.00					10.00		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack riser Cement seal riser Filter pack screen		<b>LEGEND</b> Clay Shale Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>
<b>SAMPLE TYPE DETAILS</b>		Logged By <b>K Reid</b>		
		Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH306</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m) 6.68	Co-Ordinates () E 107,839.00 N 149,401.00		
Contractor AQS		Method / Plant Used Vac.Ex.			Sheet 2 of 2

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				Installation / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	
						EOH @ 10.0m		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack riser Cement seal riser Filter pack screen		<b>LEGEND</b> Clay Shale Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>
<b>SAMPLE TYPE DETAILS</b>		Logged By <b>K Reid</b>		
		Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH307</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m)	Co-Ordinates () E 107,531.00 N 149,527.00		
Contractor AQS		Method / Plant Used Vac.Ex.			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5 1.0	BH307_0.5	0.1			0.05	TARMAC	NEC. No ACM.
					0.10	Compacted light grey sand & gravel Fill	
					(1.00)	Compacted grey brown sand & gravel Fill. At 1.1m becomes grey SHALE (weathered bedrock)	
					1.10	EOH @ 1.1m due to refusal on bedrock	

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		Tarmac       Fill (made ground)	Groundwater Table       Water Strike bgl = Below Ground Level		
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH308</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m)	Co-Ordinates () E 107,565.00 N 149,573.00		
Contractor AQS		Method / Plant Used Vac.Ex.			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.5 1.0	BH308_0.5	0.1			0.10	Grey brown gravel Fill	NEC. No ACM.	
					(0.70)	Compacted grey sand & gravel Fill. Metal fragments at 0.5m		
					0.80			
					1.00	Grey SHALE (weathered bedrock) EOH @ 1.0m		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		Fill (made ground)      Shale  Groundwater Table      Water Strike bgl = Below Ground Level			
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station		Client Electricity Supply Board		BOREHOLE No <b>BH309</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m)	Co-Ordinates () E 107,738.00 N 149,538.00	
Contractor Glovers		Method / Plant Used Terrier		Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.0					0.10	Grass. Soft brown sandy gravelly Clay.	NEC. No ACM.	
0.5	BH309_0.5	0.0			(1.30)	Compacted grey sand & gravel Fill		
1.0	BH309_1.0	0.0			1.40			
1.5					(0.60)	Brown grey clayey SAND & GRAVEL		
2.0	BH309_2.0	0.0			2.00			
2.5						EOH @ 2.0m due to difficulty digging		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack screen Cement seal riser Filter pack riser		<b>LEGEND</b> Made Ground SAND & GRAVEL with clay Fill (made ground) Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>
<b>SAMPLE TYPE DETAILS</b>		Logged By <b>K Reid</b> Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH310</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m)	Co-Ordinates () E 107,647.00 N 149,520.00		
Contractor AQS		Method / Plant Used Vac.Ex.			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.5	BH310_0.5	0.1			0.05	TARMAC	NEC. No ACM. Vac.Ex. stopped at 1.0m due to difficulty digging.	
					0.10	Compacted light brown sand Fill		
1.0	BH310_1.2	0.0			(1.40)	Compacted grey sand & gravel Fill		
					1.50			
1.5					1.70	Weathered SHALE (weathered bedrock) EOH @ 1.7m due to refusal on bedrock		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		Tarmac Shale Fill (made ground)	Groundwater Table Water Strike bgl = Below Ground Level		
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH311</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m) 3.21	Co-Ordinates ( ) E 107,648.00 N 149,621.00		
Contractor Glovers		Method / Plant Used Air Flush Rotary			Sheet 1 of 2

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Installation / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
0.0					0.30	DOLERITE	
0.5						Brown gravelly CLAY	
1.0							
1.5					(2.40)		
2.0							
2.5							
3.0					2.70	Firm grey CLAY	
3.5							
4.0							
4.5							
5.0							
5.5							
6.0					(6.60)		
6.5							
7.0							
7.5							
8.0							
8.5							
9.0							
9.5					9.30		
10.0					(0.70)	ROCK (SHALE)	
10.0					10.00		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack riser Cement seal riser Filter pack screen		<b>LEGEND</b> Basalt Clay Gravelly CLAY Shale Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>  
<b>SAMPLE TYPE DETAILS</b>		Logged By <b>K Reid</b> Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH311</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m) 3.21	Co-Ordinates () E 107,648.00 N 149,621.00		
Contractor Glovers		Method / Plant Used Air Flush Rotary			Sheet 2 of 2

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
						EOH @ 10.0m		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack riser Cement seal riser Filter pack screen		<b>LEGEND</b> Basalt Clay Gravelly CLAY Shale Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>  
<b>SAMPLE TYPE DETAILS</b>  		Logged By <b>K Reid</b> Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH312</b>
Job No 49341640	Date Start Date End Date 07-10-08	Ground Level (m)	Co-Ordinates () E 107,618.00 N 149,410.00		
Contractor AQS		Method / Plant Used Vac.Ex.			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5 1.0	BH312_0.5	0.0			0.05	TARMAC	NEC. No ACM.
					0.10	Compacted light brown sand & gravel Fill	
					(0.85)	Compacted grey sand & gravel Fill	
					0.95		
					1.10	Grey weathered SHALE (bedrock)	
						EOH @ 1.1m on bedrock	

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		Tarmac Shale Fill (made ground)	Groundwater Table Water Strike bgl = Below Ground Level		
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH313</b>
Job No 49341640	Date Start Date End Date 08-10-08	Ground Level (m)	Co-Ordinates () E 107,579.00 N 149,626.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.0					0.10	Loose light brown sand & gravel Fill	NEC. No ACM	
0.5	BH313_0.5	0.0			(1.10)	Compact grey sandy gravelly Clay		
1.0	BH313_1.0	0.0			1.20			
1.5					(0.60)	Loose light brown grey sand & gravel Fill		
2.0					1.80			
2.5	BH313_2.5	0.0			(0.70)	Gravel Fill		
3.0					2.50			
3.5	BH313_3.3	0.0			(0.80)	Very stiff grey sandy gravelly CLAY	Material is wet	
4.0					3.30			
					(0.70)	Very stiff dark brown peaty CLAY		
					4.00			
						EOH @ 4.0m due to difficulty digging and natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS
SAMPLE TYPE DETAILS		Fill (made ground)          Made Ground	Sandy Gravelly CLAY          Peaty CLAY	
		Groundwater Table bgl = Below Ground Level	Water Strike	
		Logged By	K Reid	Approved By
				D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH314</b>
Job No 49341640	Date Start Date End Date 08-10-08	Ground Level (m) 9.43	Co-Ordinates () E 107,666.00 N 149,298.00		
Contractor Glovers		Method / Plant Used Air Flush Rotary			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Installation / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
					0.20	CONCRETE	
0.5					0.50	DOLERITE	
1.0						ROCK (SHALE)	
1.5							
2.0							
2.5							
3.0							
3.5							
4.0							
4.5							
5.0							
5.5							
6.0							
6.5							
7.0					7.00	EOH @ 7.0m	

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack screen Cement seal riser Filter pack riser		<b>LEGEND</b> Concrete Shale Basalt Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>
<b>SAMPLE TYPE DETAILS</b>		Logged By <b>K Reid</b> Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station		Client Electricity Supply Board		BOREHOLE No <b>BH315</b>
Job No 49341640	Date Start Date End Date 08-10-08	Ground Level (m)	Co-Ordinates () E 107,525.00 N 149,525.00	
Contractor Glovers		Method / Plant Used Terrier		Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
					0.10	Loose grey sand & gravel Fill	NEC. No ACM.	
0.5	BH315_0.5	0.2			(1.70)	Loose dark grey Gravel with occasional clay brick fragments		
1.0	BH315_1.2	0.2			1.80			
1.5					2.00	Loose to medium dense sandy clayey GRAVEL		
2.0	BH315_2.0	0.2	↓		(1.10)	Very loose GRAVEL		
2.5					3.10			
3.0	BH315_3.0	0.3			(0.90)	Soft brown PEAT with many rootlets		
3.5					4.00			
4.0						EOH @ 4.0m		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		Fill (made ground) Sandy Clayey GRAVEL Peat	Made Ground Gravel  Groundwater Table Water Strike bgl = Below Ground Level		
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station		Client Electricity Supply Board		BOREHOLE No <b>BH316</b>
Job No 49341640	Date Start Date End Date 08-10-08	Ground Level (m)	Co-Ordinates () E 107,562.00 N 149,602.00	
Contractor Glovers		Method / Plant Used Terrier		Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
					0.10	Loose grey gravel Fill	NEC. No ACM.
0.5	BH316_0.5	0.2			0.50	Loose yellow brown Sand	
1.0	BH316_1.0				(1.10)	Loose grey sand & gravel Fill	
1.5					1.60		
2.0	BH316_2.0	0.0	↓		(1.20)	Loose medium dense grey sandy clayey Gravel	
2.5					2.80		
3.0	BH316_3.0	6.5			(0.80)	Soft dark brown PEAT. Incoming clay content below 3.2m	
3.5					3.60		
4.0					4.00	Soft dark grey silty CLAY with abundant shell fragments and rootlets. EOH @ 4.0m	Trace of H2S odour

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<p><b>WELL INSTALLATION DETAILS</b></p>	<p><b>LEGEND</b></p> <p> Made Ground (Fill)      Peat</p> <p> SILT/CLAY</p> <p> Groundwater Table      Water Strike</p> <p>bgl = Below Ground Level</p>	<p><b>GENERAL REMARKS</b></p>
<p><b>SAMPLE TYPE DETAILS</b></p>		
	Logged By <b>K Reid</b>	Approved By <b>D Mullan</b>



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH317</b>
Job No 49341640	Date Start Date End Date 08-10-08	Ground Level (m) 5.04	Co-Ordinates ( ) E 107,221.00 N 149,601.00		
Contractor Glovers		Method / Plant Used Air Flush Rotary			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Installation / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
0.5						Firm brown CLAY and boulders	
1.0							
1.5							
2.0					(4.10)		
2.5							
3.0							
3.5							
4.0					4.10	SHALE	
4.5							
5.0							
5.5							
6.0					(3.90)		
6.5							
7.0							
7.5							
8.0					8.00	EOH @ 8.0m	

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack screen Cement seal riser Filter pack riser		<b>LEGEND</b> Clay Shale Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>  
<b>SAMPLE TYPE DETAILS</b>  		Logged By <b>K Reid</b>		
		Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH318</b>
Job No 49341640	Date Start Date End Date 08-10-08	Ground Level (m) 4.19	Co-Ordinates () E 107,389.00 N 149,348.00		
Contractor Glovers		Method / Plant Used Air Flush Rotary			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Installation / Backfill	
				Legend	Depth (Thickness)	DESCRIPTION		COMMENTS
0.5			↓	[Cross-hatch pattern]	(2.90)	MADE GROUND	Water Strike at 2.5m	[Diagonal hatching]
1.0		2.90						
3.0		[Horizontal lines with downward arrows]		(2.20)	Brown CLAY with peat.			
4.0				5.10				
5.0				[Horizontal lines]	5.50	Firm brown CLAY		
5.5						EOH @ 5.5m		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack screen Cement seal riser Filter pack riser		<b>LEGEND</b> Made Ground Clay Clay with Peat Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>  
<b>SAMPLE TYPE DETAILS</b>  		Logged By <b>K Reid</b>		
		Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH319</b>
Job No 49341640	Date Start Date End Date 08-10-08	Ground Level (m) 4.04	Co-Ordinates () E 107,537.00 N 149,666.00		
Contractor Glovers		Method / Plant Used Air Flush Rotary			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Installation / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
0.0					0.30	DOLERITE	
0.5						Brown gravelly CLAY and bolders.	Water strike at 2.5m
1.0							
1.5							
2.0							
2.5			↓				
3.0					(5.20)		
3.5							
4.0							
4.5							
5.0							
5.5					5.50	EOH @ 5.5m	

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack screen Cement seal riser Filter pack riser		<b>LEGEND</b> Basalt Gravelly CLAY Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>
<b>SAMPLE TYPE DETAILS</b>		Logged By <b>K Reid</b> Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH320</b>
Job No 49341640	Date Start Date End Date 09-10-08	Ground Level (m)	Co-Ordinates () E 107,624.00 N 149,657.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.5	BH320_0.5	0.1			(0.90)	Grass. Loose brown grey Sand & Gravel	NEC. No ACM	
1.0	BH320_1.0	0.1			0.90 (0.70)	Stiff brown grey sandy clayey GRAVEL		
1.5					1.60	Stiff grey silty CLAY		
2.0	BH320_2.0				(1.40)			
2.5								
3.0					3.00	EOH @ 3.0m on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS
SAMPLE TYPE DETAILS		Made Ground (Fill)          Sandy Clayey GRAVEL	SILT/CLAY	
		Groundwater Table bgl = Below Ground Level	Water Strike	
		Logged By	K Reid	Approved By D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH321</b>
Job No 49341640	Date Start Date End Date 09-10-08	Ground Level (m)	Co-Ordinates () E 106,934.00 N 149,390.00		
Contractor Glovers		Method / Plant Used			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Installation / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
0.5					(2.90)	Gravelly CLAY	
1.0							
1.5							
2.0							
2.5							
3.0					2.90	Gravelly CLAY	
3.5					(0.80)		
4.0					3.70	Firm brown CLAY	
					4.10	EOH @ 4.1 refusal on rock.	

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<b>WELL INSTALLATION DETAILS</b> Top Cap: 1 pipe group, 1st pipe Bentonite seal riser Filter pack screen Cement seal riser Filter pack riser		<b>LEGEND</b> Gravelly CLAY CLAY Groundwater Table Water Strike bgl = Below Ground Level		<b>GENERAL REMARKS</b>  
<b>SAMPLE TYPE DETAILS</b>		Logged By <b>K Reid</b>		
		Approved By <b>D Mullan</b>		



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH322</b>
Job No 49341640	Date Start Date End Date 09-10-08	Ground Level (m)	Co-Ordinates () E 107,349.00 N 149,532.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.0					0.10	Loose grey gravel Fill	NEC. No ACM	
0.5	BH322_0.5	1.1			(1.00)	Very Stiff grey brown compacted sand and gravel Fill		
1.0	BH322_1.0	0.1			1.10	Very stiff brown grey mottled sandy clayey GRAVEL with occasional rootlets		
1.5					1.50	Medium dense grey clayey GRAVEL		
2.0	BH322_2.0	0.1			(0.60)			
2.5					2.10	Very stiff brown grey mottled sandy clayey GRAVEL		
3.0					(0.90)			
					3.00			
						EOH @ 3.0m on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<p><b>WELL INSTALLATION DETAILS</b></p>	<p><b>LEGEND</b></p> <p> Made Ground (Fill)      Sandy Clayey GRAVEL</p> <p> Clayey GRAVEL</p> <p> Groundwater Table      Water Strike</p> <p>bgl = Below Ground Level</p>	<p><b>GENERAL REMARKS</b></p>
<p><b>SAMPLE TYPE DETAILS</b></p>		
<p>Logged By <b>K Reid</b></p>		<p>Approved By <b>D Mullan</b></p>



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station		Client Electricity Supply Board		BOREHOLE No <b>BH323</b>
Job No 49341640	Date Start Date End Date 09-10-08	Ground Level (m)	Co-Ordinates () E 107,344.00 N 149,613.00	
Contractor Glovers		Method / Plant Used Terrier		Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA					
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill	
0.5 1.0 1.5 2.0	BH323_0.5	0.3			0.10 (0.60) 0.70	Loose brown sand and gravel Fill Stiff grey sand and gravel Fill	NEC. No ACM.		
	BH323_1.0	0.4			1.10	Loose to medium dense grey sandy silty GRAVEL			
						(0.50) 1.60	Dark brown peaty CLAY with occasional rootlets		
						2.00	Stiff grey slightly silty sandy CLAY		
							EOH @ 2.0m on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<p><b>WELL INSTALLATION DETAILS</b></p>   <p><b>SAMPLE TYPE DETAILS</b></p>	<p><b>LEGEND</b></p> <p> Made Ground (Fill)      Sandy Silty/Clayey GRAVEL</p> <p> Peaty CLAY      Sandy CLAY</p> <p> Groundwater Table      Water Strike</p> <p>bgl = Below Ground Level</p>	<p><b>GENERAL REMARKS</b></p>   
<p>Logged By     <b>K Reid</b></p>		<p>Approved By     <b>D Mullan</b></p>



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### EXPLORATORY HOLE LOG

Project Name and Site Location <b>ESB Phase II Environmental Site Investigation - Tarbert Generating Station</b>			Client <b>Electricity Supply Board</b>		BOREHOLE No <b>BH324</b>
Job No <b>49341640</b>	Date Start Date End Date <b>09-10-08</b>	Ground Level (m)	Co-Ordinates () <b>E 107,225.00 N 149,558.00</b>		
Contractor <b>Glovers</b>		Method / Plant Used <b>Terrier</b>			Sheet <b>1 of 1</b>

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
					0.20	Loose grey Gravel	NEC. No ACM.	
0.5	BH324_0.5	0.1			(0.80)	Soft grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular.		
1.0	BH324_1.0				1.00	Coarse angular GRAVEL	Groundwater at 1.0m	
1.5								
2.0	BH324_2.0	0.1			(2.00)			
2.5						Limited recovery between 2-3m. Small amount of soft brown peat with occasional rootlets.		
3.0	BH324_3.0	0.1			3.00	Soft grey slightly sandy slightly gravelly CLAY with occasional rootlets.		
3.5					3.30			
4.0					(0.70)	Firm light grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular.		
					4.00	EOH @ 4.0m on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS
SAMPLE TYPE DETAILS		Made Ground (Fill)          Sandy Gravelly CLAY		
		GRAVEL	Groundwater Table Water Strike bgl = Below Ground Level	
		Logged By	<b>K Reid</b>	Approved By <b>D Mullan</b>



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH325</b>
Job No 49341640	Date Start Date End Date 09-10-08	Ground Level (m)	Co-Ordinates () E 106,822.00 N 149,234.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	BH325.05 / QA1	2.3			0.10	Loose grey gravel Fill	NEC. No ACM
				(0.90)	Compacted sand and gravel Fill		
1.0					1.00		EOH at 1.0m due to difficulty digging (refusal)

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		Made Ground (Fill)  Groundwater Table       Water Strike bgl = Below Ground Level			
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH326</b>
Job No 49341640	Date Start Date End Date 09-10-08	Ground Level (m)	Co-Ordinates () E 106,734.00 N 149,228.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.5	BH326_0.5	0.2			0.10 (0.90)	Loose grey gravel Fill Soft to firm brown grey mottled slightly sandy, gravelly CLAY. Gravel is fine to coarse subangular to subrounded.	NEC. No ACM	
1.0	BH326_1.0 / QA2	0.1			1.00 (1.00)	Stiff brown grey mottled slightly sandy slightly clayey GRAVEL. Gravel is angular to subangular.		
2.0					2.00	EOH @ 2.0 on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS					
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH327</b>
Job No 49341640	Date Start Date End Date 10-10-08	Ground Level (m)	Co-Ordinates () E 106,595.00 N 149,171.00		
Contractor Glovers			Method / Plant Used Terrier		Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
					0.10	Loose grey gravel Fill	NEC. No ACM	
0.5	BH327_0.5	0.2			0.50	Stiff brown mottled grey slightly sandy slightly clayey GRAVEL. Gravel is fine to coarse subrounded to subangular.		
					0.70			
1.0	BH327_1.0	0.2			1.10	Becomes grey. Medium dense brown grey mottled sandy GRAVEL EOH @ 1.1m due to difficulty digging (refusal)		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND  Made Ground (Fill)  Groundwater Table       Water Strike bgl = Below Ground Level	GENERAL REMARKS
SAMPLE TYPE DETAILS			
		Logged By K Reid	Approved By D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH328</b>
Job No 49341640	Date Start Date End Date 10-10-08	Ground Level (m)	Co-Ordinates ( ) E 106,754.00 N 149,161.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.5	BH328.0.5 / QA3	0.3			0.10	TARMAC	NEC. No ACM	
1.0				(0.80)	Medium dense mottled brown grey sand and gravel Fill			
				0.90				
					1.00	Weathered shale BEDROCK EOH @ 1.0m on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS
SAMPLE TYPE DETAILS		Tarmac Bedrock Groundwater Table bgl = Below Ground Level	Made Ground (Fill) Water Strike	
		Logged By K Reid		Approved By D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH329</b>
Job No 49341640	Date Start Date End Date 10-10-08	Ground Level (m)	Co-Ordinates () E 106,861.00 N 149,284.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.5	BH329_0.5 / QA4	0.1			0.10	Grass. Soft brown sandy gravelly Clay	NEC. No ACM	
1.0	BH329_1.0	0.1			(1.90)	Loose brown grey mottled sandy clayey GRAVEL. Gravel is fine to coarse subangular to subrounded.		
2.0	BH329_2.0	0.1			2.00			
2.5					(1.00)	Loose yellow brown GRAVEL (limited return).		
3.0					3.00	EOH @ 3.0m on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		 Topsail  GRAVEL  Sandy Clayey GRAVEL  Groundwater Table  Water Strike bgl = Below Ground Level			
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH330</b>
Job No 49341640	Date Start Date End Date 10-10-08	Ground Level (m)	Co-Ordinates () E 106,867.00 N 149,277.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.5	BH330_0.5	0.3		 0.10	0.10	Grass. Soft brown sandy gravelly Clay	NEC. No ACM	
1.0	BH330_1.0	0.3		 (1.70)	(1.70)	Loose mottled grey brown sandy clayey GRAVEL. Gravel is fine to coarse subangular to subrounded.		
1.5				 1.80	1.80			
2.0				 2.00	2.00	Soft brown sandy gravelly CLAY EOH @ 2.0m on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		 Topsoil  Sandy Gravelly CLAY  Sandy Clayey GRAVEL  Groundwater Table  Water Strike bgl = Below Ground Level			
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH331</b>
Job No 49341640	Date Start Date End Date 10-10-08	Ground Level (m)	Co-Ordinates () E 107,299.00 N 149,463.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
					0.05	TARMAC	NEC	
					0.10	Loose light grey sand and gravel Fill		
0.5	BH331_0.5	0.2			(1.40)	Loose grey sand and gravel Fill with rare clay brick fragments		
1.0	BH331_1.0	0.5			1.50			
1.5					(0.60)	Soft light brown grey mottled SAND and GRAVEL		
2.0	BH331_2.0	0.1			2.10			
2.5					(0.90)	Stiff light brown grey mottled sandy, gravelly CLAY		
3.0					3.00			
						EOH @ 4.0m on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS
SAMPLE TYPE DETAILS		Road Pavement SAND & GRAVEL Groundwater Table bgl = Below Ground Level	Made Ground (Fill) Sandy Gravelly CLAY Water Strike	
		Logged By <b>K Reid</b>		Approved By <b>D Mullan</b>



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH332</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ( ) E 107,689.00 N 149,590.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.5	BH332_0.5	0.2			0.10	Loose light grey sand and gravel roadway		
1.0	BH332_1.0	0.2			(1.10)	Compacted brown grey mottled slightly sandy slightly clayey GRAVEL. Gravel is fine to coarse subangular to subrounded.		
					1.20	EOH @ 1.2m due to difficulty digging		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		 Made Ground (Fill)  Silty/clayey GRAVEL	 Groundwater Table  Water Strike bgl = Below Ground Level		
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH333</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates () E 107,652.00 N 149,581.00		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
0.5	BH333_0.5	0.3			0.10 (0.90)	Grass. Soft brown sandy Clay Compacted brown grey mottled slightly sandy slightly clayey GRAVEL		
1.0	BH333_1.0	0.3			1.00 (0.80)	Compacted grey slightly sandy clayey GRAVEL		
2.0	BH333_2.0 / QA7	0.3			1.80 (1.00)	Soft light brown slightly sandy gravelly CLAY		
3.0					2.80 3.00	Soft brown PEAT with many rootlets EOH @ 3.0m on natural ground		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

<p><b>WELL INSTALLATION DETAILS</b></p>   <p><b>SAMPLE TYPE DETAILS</b></p>	<p><b>LEGEND</b></p> <table style="width: 100%;"> <tr> <td> Topsil</td> <td> Made Ground (Fill)</td> </tr> <tr> <td> Silty/clayey GRAVEL</td> <td> Sandy Gravelly CLAY</td> </tr> <tr> <td> PEAT</td> <td></td> </tr> </table> <p> Groundwater Table       Water Strike bgl = Below Ground Level</p>	Topsil	Made Ground (Fill)	Silty/clayey GRAVEL	Sandy Gravelly CLAY	PEAT		<p><b>GENERAL REMARKS</b></p>   
Topsil	Made Ground (Fill)							
Silty/clayey GRAVEL	Sandy Gravelly CLAY							
PEAT								
<p>Logged By <b>K Reid</b></p>		<p>Approved By <b>D Mullan</b></p>						



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH334</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
					0.25	Concrete EOH @ 0.25m Concrete beneath existing concrete slab and corer can reach only 0.25m		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		 Concrete   Groundwater Table  Water Strike bgl = Below Ground Level			
		Logged By	K Reid	Approved By	D Mullan



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### EXPLORATORY HOLE LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		BOREHOLE No <b>BH335</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor Glovers		Method / Plant Used Terrier			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Installation / Backfill
					0.25	CONCRETE EOH @ 0.25m Concrete beneath existing concrete slab and corer can reach only 0.25m		

EXPLORATORY HOLE LOG 21/09/07 TARBERT BH LOGS.GPJ AGSS ALL.GDT 10/12/08

WELL INSTALLATION DETAILS		LEGEND		GENERAL REMARKS	
SAMPLE TYPE DETAILS		 Concrete   Groundwater Table  Water Strike bgl = Below Ground Level			
		Logged By	K Reid	Approved By	D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP01</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ( )		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	TP01_0.4	0.0		0.10	Dark brown soft silty Clay with abundant roots and occasional gravel	NEC. Moist	
				(0.55)	Firm orange brown grey gravelly CLAY with abundant cobbles and boulders. Cobbles are subangular.	NEC. Moist	
				0.65			
				0.70	Weathered bedrock (SHALE) EOH @ 0.7m due to refusal on weathered bedrock		

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

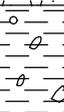
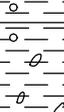
Backfill	Sample Details	Legend	GENERAL REMARKS
		Topsoil       Gravelly CLAY Shale Groundwater Table       Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP02</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ( )		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	TP02_0.3	0.0			0.10	Soft dark brown silty Clay with abundant roots and occasional gravel	
					(0.60)	Soft to firm brown orange grey gravelly CLAY with abundant subangular cobbles	
1.0	TP02_1.0	0.0			(0.50)	Stiff orange brown gravelly CLAY with boulders	
					1.20	EOH @ 1.2m on natural ground	

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		 Topsoil  Gravelly CLAY   Groundwater Table  Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station		Client Electricity Supply Board		TRIAL PIT No <b>TP03</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ( )	
Contractor CES		Method / Plant Used Mini Digger		Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	TP03_0.3	0.0			0.05	Soft, dark brown gravelly silty Clay with abundant roots	NEC
					(0.35)	Moderately dense, orange brown clayey Sand with occasional cobbles of mixed demolition rubble.	
					0.40	Stiff, dark grey orange gravelly CLAY with abundant cobbles and boulders. Possibly weathered bedrock.	
					(0.20)		
					0.60	EOH @ 0.6m due to refusal on bedrock or very large boulder	

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		 Topsoil  Made Ground  Gravelly CLAY  Groundwater Table  Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP04</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ( )		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Instrument / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
0.5	TP04_0.4	0.0			(0.50)	Dark grey brown gravelly clayey Sand with abundant subangular cobbles and boulders, fragments of timber, rope, shale, metal fencing and drink cans	
					0.50	EOH @ 0.5m due to uncovered danger tape	

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		<input checked="" type="checkbox"/> Made Ground   Groundwater Table  Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP05</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Instrument / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
0.5	TP05_0.4	0.0			(0.50)	Medium dense grey brown clayey Sand with abundant shale cobbles	
					0.50	EOH @ 0.5m due to uncovered electric cable	

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

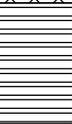
Backfill	Sample Details	Legend	GENERAL REMARKS
		<input checked="" type="checkbox"/> Made Ground   Groundwater Table  Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP06</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Instrument / Backfill
0.5	TP06_0.3	0.0			(0.40)	Orange brown sandy Gravel with occasional subangular cobbles		
					0.40			
	TP06_0.6	0.4			(0.30)	Extremely weathered SHALE with fragments of clay and cobble-sized shale fragments		
					0.70	EOH @ 0.7m on natural ground		

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend		GENERAL REMARKS	
		<input checked="" type="checkbox"/> Made Ground  Shale   Groundwater Table  Groundwater Strike			
		Logged By	S Tan	Approved By	D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP07</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ( )		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Instrument / Backfill
	TP07_0.3	0.0			(0.15) 0.15	Moderately dense, light grey sandy Gravel. Gravel is subangular to angular	NEC	
				(0.20) 0.35	Medium dense to dense orange brown sandy Gravel	NEC		
				0.45	Extremely weathered dark grey SHALE with occasional clay and cobbles EOH @ 0.45m due to refusal on bedrock			

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		<input checked="" type="checkbox"/> Made Ground  Shale   Groundwater Table  Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP08</b>
Job No 49341640	Date Start Date End Date 13-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Instrument / Backfill
0.5	TP08_0.3	2.0			(0.90)	Dark grey sandy Gravel with occasional to abundant cobbles. Compacted on top of 0.05m, moderately dense below.	Trace HC Odour at 0.3m	
1.0	TP08_0.9 / QA8	57.1			0.90	Loose to medium dense dark brown to brown subrounded GRAVEL with occasional cobbles (likely alluvial origin)		
1.5	TP08_1.5	1.1			1.70	EOH @ 1.7m	Pit collapsing	

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		<input checked="" type="checkbox"/> Made Ground <input type="checkbox"/> Gravel  <input type="checkbox"/> Groundwater Table <input type="checkbox"/> Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP09</b>
Job No 49341640	Date Start Date End Date 14-10-08	Ground Level (m)	Co-Ordinates ( )		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	TP09_0.2	0.3		(0.25)	Firm brown silty CLAY with abundant roots and occasional gravel	NEC	
				0.25	Stiff dark grey gravelly CLAY with abundant shale cobbles (subangular)	NEC	
	TP09_0.6	0.5		(0.45)			
				0.70	EOH @ 0.7m due to refusal on large boulder or weathered bedrock		

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP10</b>
Job No 49341640	Date Start Date End Date 14-10-08	Ground Level (m)	Co-Ordinates ( )		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			Instrument / Backfill
				Legend	Depth (Thickness)	DESCRIPTION	
0.5	TP10_0.4	0.7			(0.45) 0.45	Loose to medium dense dark grey to dark brown sandy Gravel with mixed demolition waste. Gravel is subangular to subrounded. Waste is concrete bounders and cobbles, fabric, rope and plastic bottles.	
1.0	TP10_1.0	0.6			(0.65) 1.10	Loose to medium dense GRAVEL (alluvial deposition in marine environment). Gravel is subrounded. Occasional cobbles, shells and shell fragments, rare sand.	
						EOH @ 1.1m on natural material	

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		<input checked="" type="checkbox"/> Made Ground <input type="checkbox"/> Gravel  <input type="checkbox"/> Groundwater Table <input type="checkbox"/> Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP11</b>
Job No 49341640	Date Start Date End Date 14-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Instrument / Backfill
0.05					0.05	Dark brown clayey Gravel		
0.5	TP11_0.3	0.5			(1.55)	Loose to medium dense grey brown sandy clayey Gravel with occasional shell fragments. Metal strip found		
1.0	TP11_1.0	0.9						
1.5	TP11_1.5	0.3			1.60	EOH @ 1.6m due to refusal on large boulder		

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		<input type="checkbox"/> Topsoil <input checked="" type="checkbox"/> Made Ground  <input checked="" type="checkbox"/> Groundwater Table <input checked="" type="checkbox"/> Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP12</b>
Job No 49341640	Date Start Date End Date 14-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	TP12_0.3	0.1		0.05	Dark brown clayey Gravel		
				(0.25)	Grey brown sandy clayey GRAVEL (possibly natural) with occasional cobbles.		
1.0	TP12_1.1	0.2		0.30	Dense dark grey and brown clayey GRAVEL with abundant shale cobbles		
				(0.90)			
1.5	TP12_1.6	0.5		1.20	Extremely weathered SHALE		
				(0.50)			
				1.70	EOH @ 1.7m		

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		Topsoil       Clayey GRAVEL Shale Groundwater Table       Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP13</b>
Job No 49341640	Date Start Date End Date 14-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Instrument / Backfill
0.5	TP13_0.3				(0.50)	Soft to firm grey brown sandy gravelly CLAY with abundant boulders		
					0.50	EOH at 0.5m due to refusal on boulders		

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

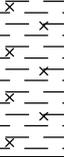
Backfill	Sample Details	Legend	GENERAL REMARKS
		 Sandy Gravelly CLAY   Groundwater Table  Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP14</b>
Job No 49341640	Date Start Date End Date 14-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA				
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	Instrument / Backfill
0.5	TP14_0.3	0.5			0.05 (0.75) 0.80	Soft dark brown gravelly Clay Loose to medium dense grey dark brown clayey Gravel with occasional cobbles and boulders, including concrete blocks and brick fragments. Gravel is angular to subangular.		
					(0.40) 1.20	Firm dark grey silty CLAY with occasional peaty organic matter and root fragments		
1.0	TP14_1.0	0.8			(0.20) 1.40	Loose to medium dense brown GRAVEL with occasional clay		
						EOH at 1.4m		

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		 Topsoil  Made Ground  SILT/CLAY  Clayey GRAVEL  Groundwater Table  Groundwater Strike	

Logged By	S Tan	Approved By	D Mullan
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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP15</b>
Job No 49341640	Date Start Date End Date 14-10-08	Ground Level (m)	Co-Ordinates ( )		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	TP15_0.15	1.4		(0.15) - 0.15	Brown orange Gravel. Spent boiler lining (fire brick).		
				(0.35) - 0.50	Loose to moderately dense, grey brown clayey Gravel with occasional demolition rubble (concrete blocks, fabric, plastic sheeting and tiling)		
	1.0	TP15_1.0	0.7		(0.50) - 1.60	Soft to firm, grey brown gravelly CLAY with abundant cobbles (subangular) of shale	
1.60 - 2.10							
2.0	TP15_2.0	0.3		2.10	EOH @ 2.1m		

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		<input checked="" type="checkbox"/> Made Ground <input type="checkbox"/> Gravelly CLAY  <input type="checkbox"/> Groundwater Table <input type="checkbox"/> Groundwater Strike	
		Logged By S Tan	Approved By D Mullan





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### TRIAL PIT LOG

Project Name and Site Location ESB Phase II Environmental Site Investigation - Tarbert Generating Station			Client Electricity Supply Board		TRIAL PIT No <b>TP17</b>
Job No 49341640	Date Start Date End Date 15-10-08	Ground Level (m)	Co-Ordinates ()		
Contractor CES		Method / Plant Used Mini Digger			Sheet 1 of 1

Depth BGL	Sample / Test Details	PID (ppm)	Water	STRATA			
				Legend	Depth (Thickness)	DESCRIPTION	COMMENTS
0.5	TP17_0.3	0.2			(0.70)	Soft to firm, dark red brown CLAY with abundant grass roots in upper 0.1m. Occasional cobbles, boulders and tree roots.	
					0.70	Soft brown orange fine sandy CLAY with occasional cobbles	
1.0	TP17_1.1	0.0			(0.30)		
					1.00	Loose to medium dense grey fine-grained SAND with rare gravel.	
					1.40	EOH at 1.4m on natural ground	

URS ENVIRONMENTAL TRIAL PIT LOG 21/09/07 TARBERT TP LOGS.GPJ AGS3 ALL.GDT 23/10/08

Backfill	Sample Details	Legend	GENERAL REMARKS
		Clay       Sandy CLAY Sand Groundwater Table       Groundwater Strike	
		Logged By S Tan	Approved By D Mullan



## **Appendix C - Ionic Balance Calculations**

**Anion - Cation Balance**

Job No:6216  
Client Reference: ESB TARBET

Alcontrol Sample Ref:	Client Sample Ref:	Calcium (mg/l)	Conc. meq/l	Magnesium (mg/l)	Conc. meq/l	Potassium (mg/l)	Conc. meq/l	Sodium (mg/l)	Conc. meq/l	Total Cations	Alkalinity (CaCO <sub>3</sub> ) (mg/l)	Bicarbonate (HCO <sub>3</sub> ) (mg/l)	Conc. meq/l	Nitrate (mg/l)	Conc. meq/l	Chloride (mg/l)	Conc. meq/l	Sulphate (mg/l)	Conc. meq/l	Total Anions	% Difference
6216-7	SW37	16.47	0.821853	5.823	0.4791747	5.3	0.135574	25.9	1.12665	<b>2.56325167</b>	60	73	1.19647	19.3	0.316327	42	1.18482	9	0.18738	<b>2.884997</b>	<b>-5.905481733</b>
6216-8	SW38	15.62	0.779438	8.113	0.6676188	6.8	0.173944	54.9	2.38815	<b>4.00915077</b>	60	73	1.1989759	15.5	0.254045	86	2.42606	21	0.43722	<b>4.31630086</b>	<b>-3.689290422</b>
6216-9	SW39	280	13.972	118.7	9.767823	322.5	8.24955	5662	246.297	<b>278.286373</b>	170	207	3.3970983	0	0	15890	448.2569	1907	39.70374	<b>491.3577383</b>	<b>-27.68440142</b>
6216-10	BH1	29.18	1.456082	10.1	0.831129	2.8	0.071624	39.8	1.7313	<b>4.090135</b>	140	171	2.7976103	2.8	0.045892	45	1.26945	10	0.2082	<b>4.321152339</b>	<b>-2.746515838</b>
6216-11	BH5	74.22	3.703578	23.37	1.9231173	5.2	0.133016	42	1.827	<b>7.5867113</b>	310	378	6.1947086	0	0	36	1.01556	17	0.35394	<b>7.564208608</b>	<b>0.148523604</b>
6216-12	MW202	27.66	1.380234	27.46	2.2596834	4	0.10232	88.6	3.8541	<b>7.5963374</b>	130	158	2.597781	0	0	155	4.37255	92	1.91544	<b>8.885771029</b>	<b>-7.823232292</b>

**% Difference = (Sum meq/l cations - Sum meq/l anions) / (Sum meq/l cations + Sum meq/l anions)**

**Anion - Cation Balance**

Job No:6300

Alcontrol Sample Ref:	Client Sample Ref:	Calcium (mg/l)	Conc. meq/l	Magnesium (mg/l)	Conc. meq/l	Potassium (mg/l)	Conc. meq/l	Sodium (mg/l)	Conc. meq/l	Total Cations	Alkalinity (CaCO <sub>3</sub> ) (mg/l)	Bicarbonate (HCO <sub>3</sub> ) (mg/l)	Conc. meq/l	Nitrate (mg/l)	Conc. meq/l	Chloride (mg/l)	Conc. meq/l	Sulphate (mg/l)	Conc. meq/l	Total Anions	% Difference
s0005	BH321	153.8	7.67462	308.6	25.394694	120	3.0696	3524	153.294	<b>189.432914</b>	150	183	2.9974396	0		5475	154.44975	665	13.8453	<b>171.2924896</b>	<b>5.028873533</b>
s0006	BH24	35.47	1.769953	11.57	0.9520953	3.7	0.094646	47.2	2.0532	<b>4.8698943</b>	150	183	2.9974396	0	0	82	2.31322	7	0.14574	<b>5.456399649</b>	<b>-5.67972742</b>
s0007	BH25	24.02	1.198598	11.6	0.954564	3.6	0.092088	52	2.262	<b>4.50725</b>	100	122	1.9982931	4.8	0.078672	0	0	20	0.4164	<b>2.493365099</b>	<b>28.76725648</b>
s0008	SW41	40.51	2.021449	72.38	5.9561502	45.9	1.174122	1201	52.2435	<b>61.3952212</b>	130	158	2.597781	1.8	0.029502	2241	63.21861	300	6.246	<b>72.09189303</b>	<b>-8.013261723</b>
s0009	SW40	222.2	11.08778	616	50.69064	23.6	0.603688	6441	280.1835	<b>342.565608</b>	160	195	3.197269	0	0	13716	386.92836	1473	30.66786	<b>420.793489</b>	<b>-10.24784813</b>
s0010	SW33	237	11.8263	659.7	54.286713	225.6	5.770848	6521	283.6635	<b>355.547361</b>	170	207	3.3970983	0	0	12344	348.22424	1605	33.4161	<b>385.0374383</b>	<b>-3.981998726</b>
s0011	SW6	2.42	0.120758	0.258	0.0212308	0.5	0.01279	5	0.2175	<b>0.37227882</b>	20	24	0.3996586	0	0	2	0.05642	0	0	<b>0.45607862</b>	<b>-10.11638163</b>
s0012	SW7	24.6	1.22754	41.62	3.4249098	21.5	0.54997	497	21.6195	<b>26.8219198</b>	80	98	1.5986345	1	0.01639	1009	28.46389	128	2.66496	<b>32.74387448</b>	<b>-9.941871423</b>
s0013	SW10	35.81	1.786919	2.863	0.2355963	5.9	0.150922	57	2.4795	<b>4.65293727</b>	140	171	2.7976103	7	0.11473	34	0.95914	44	0.91608	<b>4.787560339</b>	<b>-1.426016663</b>
s0014	SW12	236.7	11.81133	681	56.03949	234.5	5.99851	6749	293.5815	<b>367.43083</b>	150	183	2.9974396	0	0	12771	360.26991	1672	34.81104	<b>398.0783896</b>	<b>-4.003551997</b>
s0015	SW15	18.67	0.931633	2.12	0.1744548	1.7	0.043486	14	0.609	<b>1.7585738</b>	80	98	1.5986345	0.7	0.011473	18	0.50778	8	0.16656	<b>2.284447479</b>	<b>-13.0069481</b>
s0016	SW25	61.95	3.091305	6.717	0.5527419	2.7	0.069066	22	0.957	<b>4.67011293</b>	200	244	3.9965862	0.6	0.009834	26	0.73346	19	0.39558	<b>5.135460198</b>	<b>-4.745742675</b>
s0017	SW22	231.4	11.54686	658.9	54.220881	252.6	6.461508	7190	312.765	<b>384.994249</b>	160	131	2.1495082	0	0	15833	446.64893	1601	33.33282	<b>482.1312582</b>	<b>-11.20218566</b>
s0018	SW42	185.2	9.24148	517.1	42.552159	183.7	4.699046	5196	226.026	<b>282.518685</b>	130	107	1.7464754	0	0	9993	281.90253	1280	26.6496	<b>310.2986054</b>	<b>-4.686084711</b>
S0019	SW17-18	255.2	12.73448	734	60.40086	253.6	6.487088	7158	311.373	<b>390.995428</b>	170	207	3.3970983	0	0	16831	474.80251	1754	36.51828	<b>514.7178883</b>	<b>-13.66022317</b>
S0020	BH309A	26.68	1.331332	14.2	1.168518	7.5	0.19185	53.2	2.3142	<b>5.0059</b>	220	268	4.3962448	0	0	48	1.35408	0	0	<b>5.750324818</b>	<b>-6.920874479</b>
S0021	BH314	34.41	1.717059	12.75	1.0491975	3.2	0.081856	31.3	1.36155	<b>4.2096625</b>	150	183	2.9974396	1	0.01639	14	0.39494	47	0.97854	<b>4.387309649</b>	<b>-2.066392048</b>
S0022	BH301	8.889	0.4435611	3.788	0.3117145	3.2	0.081856	105	4.5675	<b>5.40463162</b>	130	158	2.597781	0.3	0.004917	57	1.60797	28	0.58296	<b>4.793628029</b>	<b>5.991253528</b>
S0023	BH319	82.32	4.107768	90.17	7.4200893	49.9	1.276442	980	42.63	<b>55.4342993</b>	383	467	7.6534626	0	0	1736	48.97256	179	3.72678	<b>60.35280257</b>	<b>-4.247885292</b>
S0024	BH311	104.5	5.21455	218.2	17.955678	93.8	2.399404	2692	117.102	<b>142.671632</b>	380	463	7.5935138	0	0	4636	130.78156	637	13.26234	<b>151.6374138</b>	<b>-3.046383353</b>
S0025	BH306	39.76	1.984024	10.54	0.8673366	6.8	0.173944	49.6	2.1576	<b>5.1829046</b>	160	195	3.197269	1.4	0.022946	56	1.57976	29	0.60378	<b>5.403754959</b>	<b>-2.086119399</b>
S0026	RC1	75.92	3.788408	32.43	2.6686647	7.8	0.199524	205.2	8.9262	<b>15.5827967</b>	180	219	3.5969276	0.4	0.006556	467	13.17407	43	0.89526	<b>17.67281358</b>	<b>-6.284704629</b>
S0027	MW101	129.5	6.46205	312.2	25.690938	154.2	3.944436	4062	176.697	<b>212.794424</b>	260	317	5.1955621	0	0	6961	196.36981	748	15.57336	<b>217.1387321</b>	<b>-1.010461277</b>
S0028	MW102	226.4	11.29736	719.4	59.199426	248.8	6.364304	7161	311.5035	<b>388.36459</b>	2260	2755	45.161424	0	0	16956	478.32876	0	0	<b>523.490184</b>	<b>-14.81876258</b>
S0029	MW103	72.99	3.642201	34.96	2.8768584	9.6	0.245568	230.7	10.03545	<b>16.8000774</b>	500	610	9.9914655	1.1	0.018029	292	8.23732	0	0	<b>18.2468145</b>	<b>-4.128003991</b>

% Difference = (Sum meq/l cations - Sum meq/l anions) / (Sum meq/l cations + Sum meq/l anions)

# **Appendix D - Additional Sampling Report**



Our Ref: 49341640

3 February 2009

Mr. Gerry Lawlor  
ESB Power Generation,  
27 Lower Fitzwilliam Street,  
Dublin 2.

**Re: Additional Sampling Works  
ESB Power Generating Station, Tarbert, Co. Kerry**

Dear Gerry

## **1.0 INTRODUCTION & BACKGROUND**

URS Ireland Ltd (URS) is pleased to present this letter report outlining the findings of additional sampling works undertaken at the ESB Power Generating Station, Tarbert Co. Kerry ("the site") in December 2008. The site location is shown on Figure 1 attached.

Elevated hydrocarbon and polychlorinated biphenyl (PCB) concentrations were detected in a groundwater sample collected from monitoring well BH318, located immediately south of the 220kV switching yard during an Environmental Site Assessment (ESA) completed by URS in October 2008<sup>1</sup>. Following this finding, URS recommended the following actions:

- Collection of a further groundwater sample from monitoring well BH318 to confirm the initial results; and
- Collection of additional sediment and surface water samples from the cooling water lagoon adjacent to monitoring well BH318, to assess whether the PCB concentrations observed in groundwater was impacting downgradient sediments and surface water.

## **2.0 SCOPE OF WORKS**

A groundwater sample was collected from monitoring well BH318 on 27 December 2008. In addition, three sediment samples (SED26, SED27 and SED28) and a surface water sample (SW43) were collected from the cooling water lagoon adjacent to monitoring well BH318 during low tide. The sampling locations are shown on Figures 2 and 3 attached (note that the location of monitoring well BH318 shown on the figures has been amended since the ESA report was issued).

The sampling works were carried out in accordance with the standards and procedures outlined in the ESA report.

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<sup>1</sup> URS Ireland Ltd, Environmental Site Assessment, ESB Generating Station, Tarbert, Co. Kerry, 29 December 2008, URS Project Ref. 49341640

The groundwater, surface water and sediment samples were submitted to Alcontrol Laboratories (Alcontrol) in Dublin for the following analysis:

- Total Petroleum Hydrocarbons (TPH) Criteria Working Group (CWG) Analysis;
- Speciated Polycyclic Aromatic Hydrocarbons (PAHs);
- PCBs;
- Volatile organic compounds (VOCs) including tentatively identified compounds (TICs); and
- Semi-volatile organic compounds (SVOCs) including TICs.

In addition, a duplicate groundwater sample from monitoring well BH318 was sent to Severn Trent Laboratories (STL) in Coventry, England and analysed for the same suite of parameters.

### **3.0 RESULTS**

No field evidence of contamination was observed during collection of the sediment or surface water samples. A slight sheen was observed on the groundwater during purging and sampling of monitoring well BH318. No odours were observed during sampling.

Analytical results for all groundwater monitoring events undertaken at BH318 (October 2008 and December 2008) and the additional sediment and surface water samples collected from the cooling water lagoon (December 2008) are presented in Tables 1 to 14.

#### **Groundwater**

A PCB concentration (total of 7 congeners) of 0.174µg/l was detected in the groundwater sample collected from BH318. A PCB concentration of 0.333µg/l was detected in the October 2008 sampling event. PCB concentrations in both samples were above the EPA Interim Guideline Values (IGVs) for groundwater of 0.01µg/l.

PCBs reported as congeners were not detected in the duplicate sample analysed by STL, however the detection limit for the method used by STL (0.1µg/l) was higher than the concentrations reported by Alcontrol. A PCB concentration reported as an aroclor of 1.4µg/l was detected by STL, with the analyst commenting that the compounds detected were consistent with Aroclor 1254.

TPH, PAH and SVOC compounds (as TICs) were also detected in groundwater at BH318. TPH concentrations detected by STL (135µg/l) were above the IGV of 10µg/l. All remaining contaminant concentrations were below their respective IGVs (where present).

#### **Surface Water**

TPH, PAHs, PCBs, VOCs and SVOCs were not detected in the surface water sample SW43 collected from the cooling water lagoon adjacent to monitoring well BH318. Hence all concentrations were below the EPA Environmental Quality Standards (EQS) for surface water (where available).

#### **Sediment**

Concentrations of TPH, PCBs, VOCs and SVOCs were not detected in sediment samples SED26, SED27 and SED28 collected from the cooling water lagoon adjacent to monitoring well BH318.

Low-level concentrations of PAH compounds were detected in samples SED26 and SED27. The concentrations observed were consistent with the PAH concentrations detected in the lagoon sediments during the October 2008 investigation.

**Conclusions & Recommendations**

The presence of PCBs in the groundwater sample collected from monitoring well BH318 confirms the finding of the initial groundwater monitoring event undertaken on 24 October 2008 for this well.

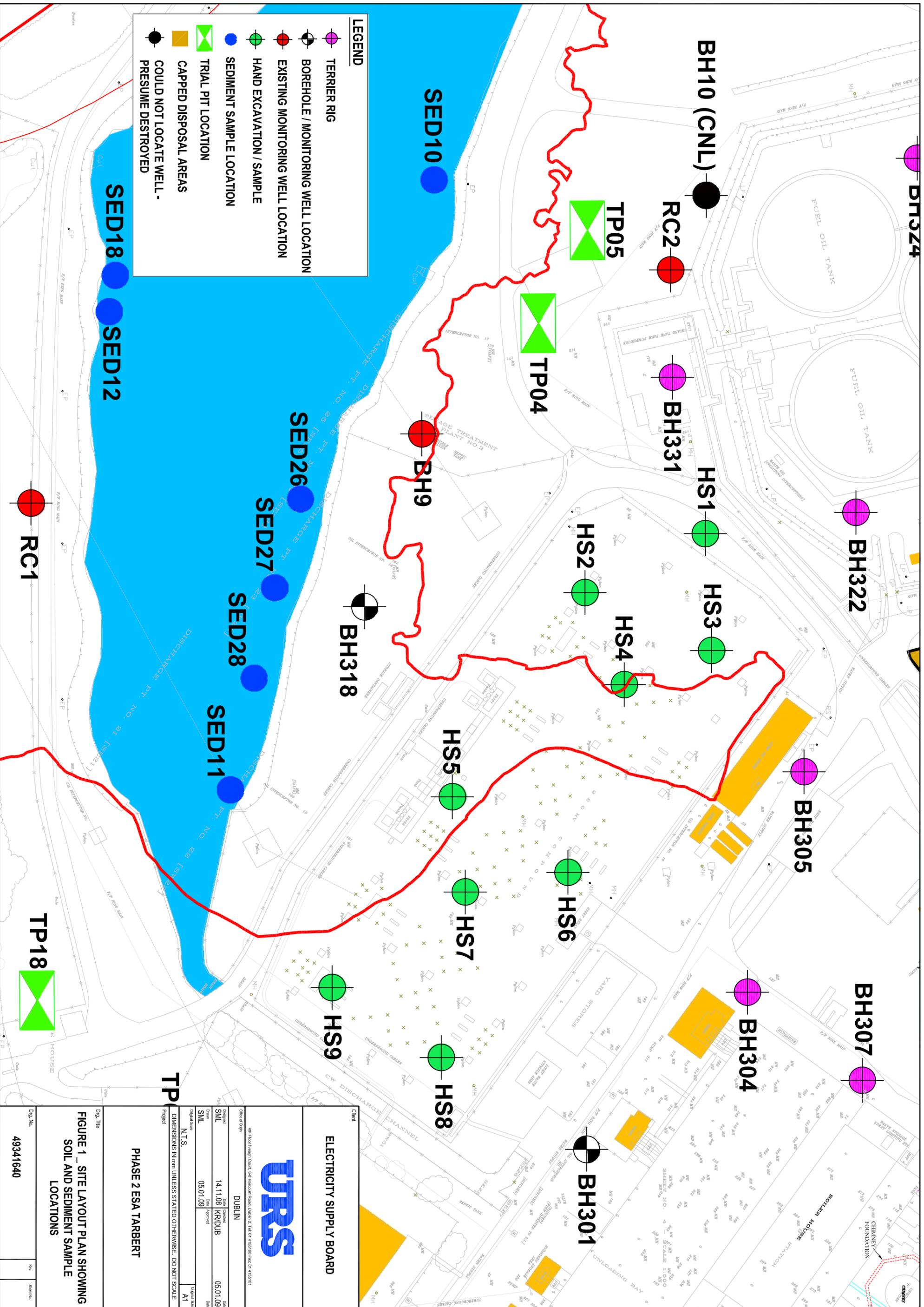
It is understood that PCB containing oils have never been used at the site. In addition, PCBs were not detected in groundwater in any of the other twenty-four monitoring wells sampled at the site during the 2008 ESA or in any of the soil, sediment or surface water samples collected during the initial investigation in October 2008 or the additional sampling works undertaken in December 2008.

Given these findings, it is likely that the PCB impact is localised in the vicinity of monitoring well BH318. However the installation of additional groundwater monitoring wells in the vicinity of BH318 should be undertaken in order to further assess the extent of PCBs in groundwater at this part of the site. In addition, it is proposed that trial pits be excavated in the vicinity of monitoring well BH318 to assess the source of the PCB impact.

Yours sincerely  
**URS Ireland Ltd**

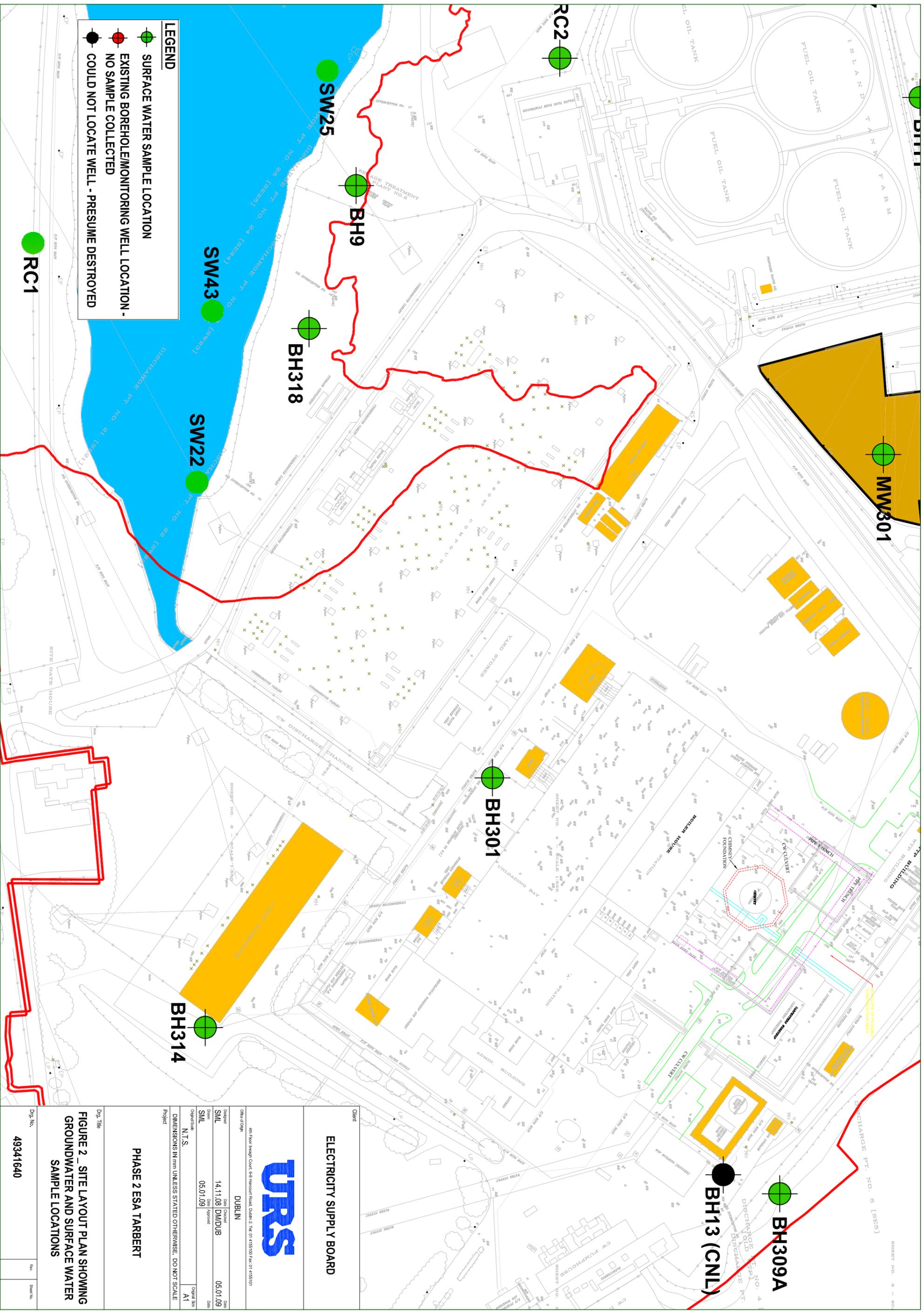


David Mullan  
Senior Environmental Scientist



Client		ELECTRICITY SUPPLY BOARD	
<b>URS</b>			
City		DUBLIN	
4th Floor (main) Court, Leilani Road, Dublin, 2. Tel: 01 455100 Fax: 01 455101			
Contract No.	14.11.08	Drawn By	KR/DUB
Contract Title	05.01.09	Checked By	05.01.09
Project	PHASE 2 ESA TARBERT		
N.T.S.			
DIMENSIONS IN mm UNLESS STATED OTHERWISE. DO NOT SCALE			
Output Size	A1		
Output Scale	1:1		
Output Date	05.01.09		
Output No.	49341640		

**FIGURE 1 - SITE LAYOUT PLAN SHOWING SOIL AND SEDIMENT SAMPLE LOCATIONS**



**LEGEND**

- SURFACE WATER SAMPLE LOCATION
- EXISTING BOREHOLE/MONITORING WELL LOCATION - NO SAMPLE COLLECTED
- COULD NOT LOCATE WELL - PRESUME DESTROYED

**ELECTRICITY SUPPLY BOARD**

**DUBLIN**

Order of Origin	DUBLIN	Date	05.01.09
Designed	SMIL	14.11.08 DM/DUB	05.01.09
Drawn	SMIL	Date Approved	
Operational	SMIL	05.01.09	
Project	N.I.S.		
DIMENSIONS IN mm UNLESS STATED OTHERWISE. DO NOT SCALE			
Project			
PHASE 2 ESA TARBERT			
Dwg. Title			
<b>FIGURE 2 _ SITE LAYOUT PLAN SHOWING GROUNDWATER AND SURFACE WATER SAMPLE LOCATIONS</b>			
Dwg. No.	49341640		
Rev.			
Sheet No.			

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 1 :** Sediment Analytical Results - Hydrocarbons

Sample Type							Sediment	Sediment	Sediment
Laboratory							Alcontrol	Alcontrol	Alcontrol
Sample ID							SED26	SED27	SED28
Depth (m)							0.1	0.1	0.1
Date							27-Dec-08	27-Dec-08	27-Dec-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
<b>Hydrocarbons</b>									
<b>Aromatics</b>									
C6-C7	mg/kg	0.01	0.106	650	nv	nv	-	-	-
C7-C8	mg/kg	0.01	0.133	670	nv	nv	-	-	-
C8-C10	mg/kg	0.01	0.167	230	nv	nv	-	-	-
C10-C12	mg/kg	0.01	0.263	45,000	nv	nv	-	-	-
C12-C16	mg/kg	0.1	0.524	73,000	nv	nv	-	-	-
C16-C21	mg/kg	0.1	1.65	57,000	nv	nv	-	-	-
C21-C35	mg/kg	0.1	13.1	57,000	nv	nv	-	-	-
Total Aromatics	mg/kg	0.1	nv	nv	nv	nv	-	-	-
<b>Aliphatics</b>									
C5-C6	mg/kg	0.01	0.093	370	nv	nv	-	-	-
C6-C8	mg/kg	0.01	0.429	740	nv	nv	-	-	-
C8-C10	mg/kg	0.01	3.32	230,000	nv	nv	-	-	-
C10-C12	mg/kg	0.01	26.2	150,000	nv	nv	-	-	-
C12-C16	mg/kg	0.1	523	180,000	nv	nv	-	-	-
C16-C21	mg/kg	0.1	65,800	IR	nv	nv	-	-	-
C21-C35	mg/kg	0.1	791,000	nv	nv	nv	-	-	-
Total Aliphatics (MO)	mg/kg	0.1	nv	nv	50	<b>5000</b>	-	-	-
Total TPH	mg/kg	0.1	0.093	nv	nv	nv	-	-	-
<b>BTEX</b>									
Benzene	mg/kg	0.01	0.00156	1.5	0.01	<b>1</b>	-	-	-
Toluene	mg/kg	0.01	0.0162	150	0.01	<b>130</b>	-	-	-
Ethylbenzene	mg/kg	0.01	0.0467	48,000	0.03	<b>50</b>	-	-	-
Total Xylene	mg/kg	0.01	0.0458	320	0.1	<b>25</b>	-	-	-
BTEX	mg/kg	nv	nv	nv	nv	nv	-	-	-
MTBE	mg/kg	0.01	0.00699	1,780	nv	<b>100</b>	-	-	-

xx Exceeds Human Health Generic Assessment Criteria  
xx Exceeds Controlled Waters Generic Assessment Criteria  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 IR Insignificant risk to identified potential receptors

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 2 :** Sediment Analytical Results - PAHs

Sample Type							Sediment	Sediment	Sediment
Laboratory							Alcontrol	Alcontrol	Alcontrol
Sample ID							SED26	SED27	SED28
Depth (m)							0.1	0.1	0.1
Date							27-Dec-08	27-Dec-08	27-Dec-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
<b>PAHs</b>									
Naphthalene*	ug/kg	1	13.6	270,000	nv	nv	6	4	7
Acenaphthylene	ug/kg	1	588	2,100,000	nv	nv	6	6	5
Acenaphthene	ug/kg	1	56,700	34,000,000	nv	nv	24	26	26
Fluorene	ug/kg	1	35,100	69,000,000	nv	nv	7	6	5
Phenanthrene*	ug/kg	1	2,390	34,000,000	nv	nv	20	19	16
Anthracene*	ug/kg	1	30.8	52,000,000	nv	nv	7	6	6
Fluoranthene*	ug/kg	1	112	3,400,000	nv	nv	31	34	32
Pyrene	ug/kg	1	199,000	35,000,000	nv	nv	26	28	28
Benzo(a)anthracene*	ug/kg	1	35.7	340,000	nv	nv	37	45	31
Chrysene*	ug/kg	1	440	3,500,000	nv	nv	23	27	20
Benzo(b)+Benzo(k) fluoranthene*	ug/kg	1	nv	350,000	nv	nv	34	43	29
Benzo(a)pyrene*	ug/kg	1	106.7	35,000	nv	nv	15	19	11
Indeno(123cd)pyrene*	ug/kg	1	nv	350,000	nv	nv	14	15	15
Dibenzo(ah)anthracene	ug/kg	1	365	35,000	nv	nv	9	10	8
Benzo(ghi)perylene*	ug/kg	1	nv	52,000,000	nv	nv	14	16	12
Total 10 PAHs Dutch (10)	ug/kg	nv	nv	nv	1,000	<b>40,000</b>	201	228	179
Total 16 EPA PAHs (16)	ug/kg	nv	nv	nv	nv	nv	273	304	251

xx	Exceeds Human Health Generic Assessment Criteria
xx	Exceeds Controlled Waters Generic Assessment Criteria
MDL	Method Detection Limit
*	Included in Dutch sum of 10
-	Less than MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 3 :** Sediment Analytical Results - PCBs

Sample Type							Sediment	Sediment	Sediment
Laboratory							Alcontrol	Alcontrol	Alcontrol
Sample ID							SED26	SED27	SED28
Depth (m)							0.1	0.1	0.1
Date							27-Dec-08	27-Dec-08	27-Dec-08
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
<b>PCBs</b>									
PCB Congener 28	mg/kg	0.001	0.043	16.8	nv	nv	-	-	-
PCB Congener 52	mg/kg	0.001	0.052	16.8	nv	nv	-	-	-
PCB Congener 101	mg/kg	0.001	0.353	16.8	nv	nv	-	-	-
PCB Congener 118	mg/kg	0.001	2.34	6.82	nv	nv	-	-	-
PCB Congener 153	mg/kg	0.001	0.8	16.8	nv	nv	-	-	-
PCB Congener 138	mg/kg	0.001	0.535	16.8	nv	nv	-	-	-
PCB Congener 180	mg/kg	0.001	1.020	16.8	nv	nv	-	-	-
PCB Total of 7 Congeners	mg/kg	0.001	0.004	16.8	0.02	<b>1</b>	-	-	-

xx	Exceeds Human Health Generic Assessment Criteria
xx	Exceeds Controlled Waters Generic Assessment Criteria
MDL	Method Detection Limit
-	Less than MDL
na	Not Analysed
nv	No Value

**Client** ESB  
**Project** Phase 2 Environmental Investigation  
**Location** ESB Tarbert, Co. Kerry  
**Job Number** 49341640  
**Table 4 :** Sediment Analytical Results - VOCs and SVOCs

							Sediment	Sediment	Sediment
							Alcontrol	Alcontrol	Alcontrol
							SED26	SED27	SED28
							0.1	0.1	0.1
							27-Dec-08	27-Dec-08	27-Dec-08
Sample Type									
Laboratory									
Sample ID									
Depth (m)									
Date									
Parameters	Units	MDL	Controlled Water GAC - Soil	Human Health GAC - Soil	Dutch MAC - Screening (S) Value	Dutch MAC - Intervention (I) Value			
VOCs	ug/kg	1	nv	nv	nv	nv	- *	- *	- *
SVOCs	ug/kg	100	nv	nv	nv	nv	- *	- *	- *
<b>VOC TICs</b>	ug/kg	1	nv	nv	nv	nv	none detected	none detected	none detected
<b>SVOC TICs</b>									
Sulfur	ug/kg	100	nv	nv	nv	nv	1,571	2,827	1,853
Butyl hexadecanoate	ug/kg	100	nv	nv	nv	nv	1,721	1,689	1,073
Octadecanoic acid, butyl ester	ug/kg	100	nv	nv	nv	nv	1,304	1,289	759
Hydrocarbons (C16-C26)	ug/kg	100	nv	nv	nv	nv	5,807	5,596	2,359

xx Exceeds Human Health Generic Assessment Criteria  
xx Exceeds Controlled Waters Generic Assessment Criteria  
 MDL Method Detection Limit  
 - Less than MDL  
 na Not Analysed  
 nv No Value  
 \* All individual VOC and SVOC compounds were below the laboratory MDL

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 5:** Groundwater Analytical Results: Hydrocarbons

Sample Type						Groundwater	Groundwater	Groundwater
Laboratory						Alcontrol	Alcontrol	STL
Sample ID						BH318	BH318	BH318
Date						24-Oct-08	27-Dec-08	27-Dec-08
Parameters	UNITS	Alcontrol MDL	STL	MDL	IGV			
<b>Hydrocarbons</b>								
<b>Aromatics</b>								
C6-C7	ug/l	10	5		nv	-	-	-
C7-C8	ug/l	10	5		nv	-	-	-
C8-C10	ug/l	10	10		nv	-	-	-
C10-C12	ug/l	10	10		nv	-	-	-
C12-C16	ug/l	10	20		nv	563	-	-
C16-C21	ug/l	10	20		nv	-	-	-
C21-C35	ug/l	10	50		nv	-	-	-
Total Aromatics	ug/l	10	50		nv	563	-	-
<b>Aliphatics</b>								
C5-C6	ug/l	10	nv		nv	-	-	nv
C6-C8	ug/l	10	10		nv	-	-	-
C8-C10	ug/l	10	10		nv	-	-	-
C10-C12	ug/l	10	10		nv	-	-	-
C12-C16	ug/l	10	20		nv	-	-	24
C16-C21	ug/l	10	20		nv	-	-	32
C21-C35	ug/l	10	50		nv	-	-	79
Total Aliphatics (MO)	ug/l	10	50		nv	-	-	135
Total TPH	ug/l	10	50		10	563	-	135
<b>BTEX</b>								
Benzene	ug/l	10	1		1	-	-	-
Toluene	ug/l	10	1		10	-	-	-
Ethylbenzene	ug/l	10	1		10	-	-	-
Total Xylene	ug/l	10	1		10	-	-	-
MTBE	ug/l	10	1		30	-	-	-
BTEX	ug/l	10	1		nv	-	-	-

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 nv No Value  
 MO Mineral Oil

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 6:** Groundwater Analytical Results: PAHs

Sample Type		Groundwater	Groundwater	Groundwater			
Laboratory		Alcontrol	Alcontrol	STL			
Sample ID		BH318	BH318	BH318			
Date		24-Oct-08	27-Dec-08	27-Dec-08			
Parameter	Units	Alcontrol MDL	STL MDL	IGV			
<b>PAHs</b>							
Naphthalene	ug/l	0.01	0.1	1	0.104	-	0.130
Acenaphthylene	ug/l	0.01	0.1	nv	0.033	-	-
Acenaphthene	ug/l	0.01	0.1	nv	0.143	-	-
Fluorene	ug/l	0.01	0.1	nv	0.153	-	-
Phenanthrene	ug/l	0.01	0.1	nv	0.207	-	-
Anthracene	ug/l	0.01	0.1	10000	0.028	-	-
Fluoranthene**	ug/l	0.01	0.1	1	-	-	-
Pyrene	ug/l	0.01	0.1	nv	-	-	-
Benzo(a)anthracene	ug/l	0.01	0.1	nv	-	-	-
Chrysene	ug/l	0.01	0.1	nv	-	-	-
Benzo(b)+Benzo(k) fluoranthene**	ug/l	0.01	0.1	0.05*	-	-	-
Benzo(a)pyrene**	ug/l	0.01	0.1	0.01	-	-	-
Indeno(123cd)pyrene**	ug/l	0.01	0.1	0.05	-	-	-
Dibenzo(ah)anthracene	ug/l	0.01	0.1	nv	-	-	-
Benzo(ghi)perylene**	ug/l	0.01	0.1	0.05	-	-	-
Sum 6 PAHs	ug/l	nv	nv	0.1	-	-	-
Total 16 EPA PAHs	ug/l	0.01	0.1	nv	0.668	-	0.130

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 \* Laboratory results are presented as a sum of the 2 compounds. Consequently, the lower IGV of 0.05mg/l for benzo(k)fluoranthene is used  
 \*\* Included in sum of 6 PAHs  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 7:** Groundwater Analytical Results: PCBs

Sample Type					Groundwater	Groundwater	Groundwater
Laboratory					Alcontrol	Alcontrol	STL
Sample ID					BH318	BH318	BH318
Date					24-Oct-08	27-Dec-08	27-Dec-08
Parameter	Units	Alcontrol MDL	STL MDL	IGV			
<b>PCBs</b>							
PCB Congener 28	ug/l	0.01	0.1	nv	0.037	-	-
PCB Congener 52	ug/l	0.01	0.1	nv	0.049	0.015	-
PCB Congener 101	ug/l	0.01	0.1	nv	0.083	0.042	-
PCB Congener 118	ug/l	0.01	0.1	nv	0.061	0.038	-
PCB Congener 153	ug/l	0.01	0.1	nv	0.036	0.026	-
PCB Congener 138	ug/l	0.01	0.1	nv	0.068	0.052	-
PCB Congener 180	ug/l	0.01	0.1	nv	-	-	-
PCB Total of 7 Congeners	ug/l	0.01	0.1	0.01	<b>0.333</b>	<b>0.174</b>	-
PCB Total as Aroclors	ug/l	nv	1	nv	nv	nv	1.4*

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 nv No Value  
 \* Contamination found was consistent with being Aroclor 1254

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 8:** Groundwater Analytical Results: VOCs

Sample Type						Groundwater	Groundwater	Groundwater
	Laboratory						Alcontrol	Alcontrol
Sample ID						BH318	BH318	BH318
Date						24-Oct-08	27-Dec-08	27-Dec-08
Parameters	Units	Alcontrol MDL	STL	MDL	IGV			
Dichlorodifluoromethane	ug/l	1.0	1.0		nv	-	-	-
Chloromethane	ug/l	1.0	1.0		nv	-	-	-
Vinyl Chloride	ug/l	1.0	1.0		nv	-	-	-
Bromomethane	ug/l	1.0	1.0		nv	-	-	-
Chloroethane	ug/l	1.0	1.0		nv	-	-	-
Trichlorofluoromethane	ug/l	1.0	1.0		nv	-	-	-
1,1-Dichloroethene	ug/l	1.0	1.0		nv	-	-	-
Carbon Disulphide	ug/l	1.0	1.0		nv	-	-	-
Dichloromethane	ug/l	1.0	1.0		10	-	-	-
Tert-butyl methyl ether	ug/l	1.0	1.0		30	-	-	-
Trans-1,2-Dichloroethene	ug/l	1.0	1.0		nv	-	-	-
1,1-Dichloroethane	ug/l	1.0	1.0		nv	-	-	-
Cis-1,2-Dichloroethene	ug/l	1.0	1.0		nv	-	-	-
2,2-Dichloropropane	ug/l	1.0	1.0		nv	-	-	-
Bromochloromethane	ug/l	1.0	1.0		nv	-	-	-
Chloroform	ug/l	1.0	1.0		12	-	-	-
1,1,1-Trichloroethane	ug/l	1.0	1.0		500	-	-	-
1,1-Dichloropropene	ug/l	1.0	1.0		nv	-	-	-
Carbontetrachloride	ug/l	1.0	1.0		nv	-	-	-
1,2-Dichloroethane	ug/l	1.0	1.0		3	-	-	-
Benzene	ug/l	1.0	1.0		1	-	-	-
Trichloroethene	ug/l	1.0	1.0		70	-	-	-
1,2-Dichloropropane	ug/l	1.0	1.0		nv	-	-	-
Dibromomethane	ug/l	1.0	1.0		nv	-	-	-
Bromodichloromethane	ug/l	1.0	1.0		nv	-	-	-
Cis-1,3-Dichloropropene	ug/l	1.0	1.0		nv	-	-	-
Toluene	ug/l	1.0	1.0		10	-	-	-
Trans-1,3-Dichloropropene	ug/l	1.0	1.0		nv	-	-	-
1,1,2-Trichloroethane	ug/l	1.0	1.0		nv	-	-	-
1,3-Dichloropropane	ug/l	1.0	1.0		nv	-	-	-
Tetrachloroethene	ug/l	1.0	1.0		40	-	-	-
Dibromochloromethane	ug/l	1.0	1.0		nv	-	-	-
1,2-Dibromoethane	ug/l	1.0	1.0		nv	-	-	-
Chlorobenzene	ug/l	1.0	1.0		1	-	-	-
1,1,1,2-tetrachloroethane	ug/l	1.0	1.0		nv	-	-	-
Ethylbenzene	ug/l	1.0	1.0		10	-	-	-
p/m-Xylene	ug/l	1.0	1.0		10	-	-	-
o-Xylene	ug/l	1.0	1.0		10	-	-	-
Styrene	ug/l	1.0	1.0		nv	-	-	-
Bromoform	ug/l	1.0	1.0		nv	-	-	-
Isopropylbenzene	ug/l	1.0	1.0		nv	-	-	-
1,1,2,2-Tetrachloroethane	ug/l	1.0	1.0		nv	-	-	-
1,2,3-Trichloropropane	ug/l	1.0	1.0		nv	-	-	-
Bromobenzene	ug/l	1.0	1.0		nv	-	-	-
Propylbenzene	ug/l	1.0	1.0		nv	-	-	-
2-Chlorotoluene	ug/l	1.0	1.0		nv	-	-	-
1,3,5-Trimethylbenzene	ug/l	1.0	1.0		nv	-	-	-
4-Chlorotoluene	ug/l	1.0	1.0		nv	-	-	-
Tert-Butylbenzene	ug/l	1.0	1.0		nv	-	-	-
1,2,4-Trimethylbenzene	ug/l	1.0	1.0		nv	-	-	-
Sec-Butylbenzene	ug/l	1.0	1.0		nv	-	-	-
4-Isopropyltoluene	ug/l	1.0	1.0		nv	-	-	-
1,3-Dichlorobenzene	ug/l	1.0	1.0		nv	-	-	-
1,4-Dichlorobenzene	ug/l	1.0	1.0		nv	-	-	-
n-Butylbenzene	ug/l	1.0	1.0		nv	-	-	-
1,2-Dichlorobenzene	ug/l	1.0	1.0		10	-	-	-
1,2-Dibromo-3-Chloropropane	ug/l	1.0	2.0		nv	-	-	-
1,2,4-Trichlorobenzene	ug/l	1.0	1.0		0.4	-	-	-
Hexachlorobutadiene	ug/l	1.0	1.0		0.1	-	-	-
Naphthalene	ug/l	1.0	1.0		1	-	-	-
1,2,3-Trichlorobenzene	ug/l	1.0	1.0		nv	-	-	-
VOC TICs	ug/l	nv	nv		nv	nd	nd	nd

IGV Interim Guideline Value for Groundwater  
**xx** Exceeds IGV for Groundwater  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value  
 nd Not Detected

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 9: Groundwater Analytical Results: SVOCs

Sample Type	Laboratory	Sample ID	Date	Groundwater			
				Alcontrol	Alcontrol	Groundwater	
Parameters	Units	Alcontrol MDL	STL MDL	IGV	BH318	BH318	STL
					24-Oct-08	27-Dec-08	27-Dec-08
Phenol	ug/l	1	2	0.5	-	-	-
2-Chlorophenol	ug/l	1	1	200	-	-	-
2-Methylphenol	ug/l	1	1	nv	-	-	-
4-Methylphenol	ug/l	1	1	nv	-	-	-
2-Nitrophenol	ug/l	1	1	nv	-	-	-
4-Nitrophenol	ug/l	1	5	nv	-	-	-
2,4-Dichlorophenol	ug/l	1	1	nv	-	-	-
2,4-Dimethylphenol	ug/l	1	2	nv	-	-	-
4-Chloro-3-methylphenol	ug/l	1	1	nv	-	-	-
2,4,6-Trichlorophenol	ug/l	1	1	200	-	-	-
2,4,5-Trichlorophenol	ug/l	1	1	nv	-	-	-
Pentachlorophenol	ug/l	1	5	2	-	-	-
1,3-Dichlorobenzene	ug/l	1	1	nv	-	-	-
1,4-Dichlorobenzene	ug/l	1	1	10	-	-	-
1,2-Dichlorobenzene	ug/l	1	1	10	-	-	-
1,2,4-Trichlorobenzene	ug/l	1	1	0.4	-	-	-
Nitrobenzene	ug/l	1	1	10	-	-	-
Azobenzene	ug/l	1	1	nv	-	-	-
Hexachlorobenzene	ug/l	1	1	0.03	-	-	-
Naphthalene	ug/l	1	1	1	-	-	-
Acenaphthylene	ug/l	1	1	nv	-	-	-
Acenaphthene	ug/l	1	1	nv	-	-	-
Fluorene	ug/l	1	1	nv	-	-	-
Phenanthrene	ug/l	1	1	nv	-	-	-
Anthracene	ug/l	1	1	10000	-	-	-
Fluoranthrene	ug/l	1	1	1	-	-	-
Pyrene	ug/l	1	1	nv	-	-	-
Benzo(a)anthracene	ug/l	1	1	nv	-	-	-
Chrysene	ug/l	1	1	nv	-	-	-
Benzo(b)fluoranthrene	ug/l	1	1	0.5	-	-	-
Benzo(k)fluoranthrene	ug/l	1	1	0.05	-	-	-
Benzo(a)pyrene	ug/l	1	1	0.01	-	-	-
Indeno(1,2,3-cd)pyrene	ug/l	1	1	0.05	-	-	-
Dibenzo(a,h)anthracene	ug/l	1	1	nv	-	-	-
Benzo(ghi)perylene	ug/l	1	1	0.05	-	-	-
2-Chloronaphthalene	ug/l	1	1	nv	-	-	-
2-Methylnaphthalene	ug/l	1	1	nv	-	-	-
Carbazole	ug/l	1	1	nv	-	-	-
Isophorone	ug/l	1	1	nv	-	-	-
Dibenzofuran	ug/l	1	1	nv	-	-	-
Dimethyl phthalate	ug/l	1	1	nv	-	-	-
Diethyl phthalate	ug/l	1	3	10	-	-	-
Di-n-butylphthalate	ug/l	1	10	2	-	-	-
Di-n-octylphthalate	ug/l	1	1	0.1	-	-	-
Bis(2-ethylhexyl)phthalate	ug/l	1	10	8	1	-	-
Butylbenzylphthalate	ug/l	1	1	1	-	-	-
4-Chloroaniline	ug/l	1	1	nv	-	-	-
2-Nitroaniline	ug/l	1	1	10	-	-	-
3-Nitroaniline	ug/l	1	1	10	-	-	-
4-Nitroaniline	ug/l	1	1	nv	-	-	-
2,4-Dinitrotoluene	ug/l	1	1	nv	-	-	-
2,6-Dinitrotoluene	ug/l	1	1	nv	-	-	-
Bis(2-chloroethyl)ether	ug/l	1	1	30	-	-	-
4-Bromophenylphenylether	ug/l	1	1	nv	-	-	-
4-Chlorophenylphenylether	ug/l	1	1	40	-	-	-
Hexachloroethane	ug/l	1	1	10	-	-	-
Hexachlorobutadiene	ug/l	1	1	0.1	-	-	-
Hexchlorocyclopentadiene	ug/l	1	1	nv	-	-	-
Bis(2-chloroethoxy)methane	ug/l	1	1	10	-	-	-
N-nitrosodi-n-propylamine	ug/l	1	1	nv	-	-	-
<b>SVOC-TIC</b>							
Hydrocarbons (C20-C26)	ug/l	nv	nv	nv	nd	5.6	nd
1-(4-phenylcyclohexyl)-1-hexanone	ug/l	nv	nv	nv	9.8	nd	nd
Ethanol	ug/l	nv	nv	nv	1.66	nd	nd
1,6-Dimethylnaphthalene	ug/l	nv	nv	nv	2.14	nd	nd
Butyl Octadecanoate	ug/l	nv	nv	nv	6.9	nd	nd
Tetracosane	ug/l	nv	nv	nv	1.1	nd	nd

IGV - Interim Guideline Value for Groundwater

**xx - Exceeds IGV for Groundwater**

MDL - Method Detection Limit

- Less than the MDL

na - Not Analysed

nv - No Value

nd - Not Detected

NDP - No Determination Possible

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 10:** Surface Water Analytical Results - Hydrocarbons

Sample Type					Surface Water
Laboratory					Alcontrol
Sample ID					SW43
Date					27-Dec-08
Parameters	UNITS	MDL	EQS		
<b>Hydrocarbons</b>					
<b>Aromatics</b>					
C6-C7	ug/L	10	nv	-	-
C7-C8	ug/L	10	nv	-	-
C8-C10	ug/L	10	nv	-	-
C10-C12	ug/L	10	nv	-	-
C12-C16	ug/L	10	nv	-	-
C16-C21	ug/L	10	nv	-	-
C21-C35	ug/L	10	nv	-	-
Total Aromatics	ug/L	nv	nv	-	-
<b>Aliphatics</b>					
C5-C6	ug/L	10	nv	-	-
C6-C8	ug/L	10	nv	-	-
C8-C10	ug/L	10	nv	-	-
C10-C12	ug/L	10	nv	-	-
C12-C16	ug/L	10	nv	-	-
C16-C21	ug/L	10	nv	-	-
C21-C35	ug/L	10	nv	-	-
Total Aliphatics (MO)	ug/L	10	300	-	-
Total TPH	ug/L	nv	nv	-	-
<b>BTEX</b>					
Benzene	ug/L	10	10	-	-
Toluene	ug/L	10	10	-	-
Ethylbenzene	ug/L	10	10	-	-
Total Xylene	ug/L	10	10	-	-
MTBE	ug/L	10	nv	-	-
BTEX	ug/L	nv	nv	-	-

EQS	EPA Proposed Environmental Quality Standards for Surface Water
xx	Exceeds EQS for Surface Waters
MDL	Method Detection Limit
-	Less than the MDL
na	Not Analysed
nv	No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 11:** Surface Water Analytical Results - PAHs

Sample Type	Surface Water			
Laboratory	Alcontrol			
Sample ID	SW43			
Date	27-Dec-08			
Parameters	UNITS	MDL	EQS	
<b>PAHs</b>				
Naphthalene	ug/L	0.01	nv	-
Acenaphthylene	ug/L	0.01	nv	-
Acenaphthene	ug/L	0.01	nv	-
Fluorene	ug/L	0.01	nv	-
Phenanthrene	ug/L	0.01	nv	-
Anthracene	ug/L	0.01	nv	-
Fluoranthene*	ug/L	0.01	nv	-
Pyrene	ug/L	0.01	nv	-
Benzo(a)anthracene	ug/L	0.01	nv	-
Chrysene	ug/L	0.01	nv	-
Benzo(b)+Benzo(k)fluoranthene*	ug/L	0.01	nv	-
Benzo(a)pyrene*	ug/L	0.01	nv	-
Indeno(123cd)pyrene*	ug/L	0.01	nv	-
Dibenzo(ah)anthracene	ug/L	0.01	nv	-
Benzo(ghi)perylene*	ug/L	0.01	nv	-
Sum 6 PAHs	ug/L	nv	0.2	-
Total 16 EPA PAHs	ug/L	nv	nv	-

EQS EPA Proposed Environmental Quality Standards for Surface Water  
 xx Exceeds EQS for Surface Waters  
 MDL Method Detection Limit  
 - Less than the MDL  
 na Not Analysed  
 nv No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 12:** Surface Water Analytical Results: PCBs

Sample Type	Surface Water			
Laboratory	Alcontrol			
Sample ID	SW43			
Date	27-Dec-08			
Parameter	Units	MDL	EQS	
<b>PCBs</b>				
PCB Congener 28	ug/l	0.01	nv	-
PCB Congener 52	ug/l	0.01	nv	-
PCB Congener 101	ug/l	0.01	nv	-
PCB Congener 118	ug/l	0.01	nv	-
PCB Congener 153	ug/l	0.01	nv	-
PCB Congener 138	ug/l	0.01	nv	-
PCB Congener 180	ug/l	0.01	nv	-
PCB Total of 7 Congeners	ug/l	0.01	1	-

EQS	EPA Proposed Environmental Quality Standards for Surface Water
xx	Exceeds EQS for Surface Waters
MDL	Method Detection Limit
-	Less than the MDL
na	Not Analysed
nv	No Value

**Client:** ESB  
**Project:** Phase 2 Environmental Investigation  
**Location:** ESB Tarbert, Co. Kerry  
**Job No:** 49341640  
**Table 13:** Surface Water Analytical Results: VOCs

Sample Type				Surface Water
Laboratory				Alcontrol
Sample ID				SW43
Date				27-Dec-08
Parameters	Units	MDL	EQS	
Dichlorodifluoromethane	ug/l	1.0	nv	-
Chloromethane	ug/l	1.0	nv	-
Vinyl Chloride	ug/l	1.0	10	-
Bromomethane	ug/l	1.0	nv	-
Chloroethane	ug/l	1.0	nv	-
Trichlorofluoromethane	ug/l	1.0	nv	-
1,1-Dichloroethene	ug/l	1.0	nv	-
Carbon Disulphide	ug/l	1.0	nv	-
Dichloromethane	ug/l	1.0	10	-
Tert-butyl methyl ether	ug/l	1.0	nv	-
Trans-1,2-Dichloroethene	ug/l	1.0	nv	-
1,1-Dichloroethane	ug/l	1.0	nv	-
Cis-1,2-Dichloroethene	ug/l	1.0	nv	-
2,2-Dichloropropane	ug/l	1.0	nv	-
Bromochloromethane	ug/l	1.0	nv	-
Chloroform	ug/l	1.0	12	-
1,1,1-Trichloroethane	ug/l	1.0	500	-
1,1-Dichloropropene	ug/l	1.0	nv	-
Carbontetrachloride	ug/l	1.0	12	-
1,2-Dichloroethane	ug/l	1.0	nv	-
Benzene	ug/l	1.0	10	-
Trichloroethene	ug/l	1.0	nv	-
1,2-Dichloropropane	ug/l	1.0	nv	-
Dibromomethane	ug/l	1.0	nv	-
Bromodichloromethane	ug/l	1.0	nv	-
Cis-1,3-Dichloropropene	ug/l	1.0	nv	-
Toluene	ug/l	1.0	10	-
Trans-1,3-Dichloropropene	ug/l	1.0	nv	-
1,1,2-Trichloroethane	ug/l	1.0	nv	-
1,3-Dichloropropane	ug/l	1.0	nv	-
Tetrachloroethene	ug/l	1.0	nv	-
Dibromochloromethane	ug/l	1.0	nv	-
1,2-Dibromoethane	ug/l	1.0	nv	-
Chlorobenzene	ug/l	1.0	1	-
1,1,1,2-tetrachloroethane	ug/l	1.0	nv	-
Ethylbenzene	ug/l	1.0	10	-
p/m-Xylene	ug/l	1.0	10	-
o-Xylene	ug/l	1.0	10	-
Styrene	ug/l	1.0	nv	-
Bromoform	ug/l	1.0	nv	-
Isopropylbenzene	ug/l	1.0	nv	-
1,1,2,2-Tetrachloroethane	ug/l	1.0	nv	-
1,2,3-Trichloropropane	ug/l	1.0	nv	-
Bromobenzene	ug/l	1.0	nv	-
Propylbenzene	ug/l	1.0	nv	-
2-Chlorotoluene	ug/l	1.0	nv	-
1,3,5-Trimethylbenzene	ug/l	1.0	nv	-
4-Chlorotoluene	ug/l	1.0	nv	-
Tert-Butylbenzene	ug/l	1.0	nv	-
1,2,4-Trimethylbenzene	ug/l	1.0	nv	-
Sec-Butylbenzene	ug/l	1.0	nv	-
4-Isopropyltoluene	ug/l	1.0	nv	-
1,3-Dichlorobenzene	ug/l	1.0	nv	-
1,4-Dichlorobenzene	ug/l	1.0	nv	-
n-Butylbenzene	ug/l	1.0	nv	-
1,2-Dichlorobenzene	ug/l	1.0	10	-
1,2-Dibromo-3-Chloropropan	ug/l	1.0	nv	-
1,2,4-Trichlorobenzene	ug/l	1.0	0.4	-
Hexachlorobutadiene	ug/l	1.0	0.1	-
Naphthalene	ug/l	1.0	nv	-
1,2,3-Trichlorobenzene	ug/l	1.0	nv	-
<b>VOC TICs</b>	ug/l	nv	nv	nd

EQS	EPA Proposed Environmental Quality Standards for Surface Water
xx	Exceeds EQS for Surface Waters
MDL	Method Detection Limit
-	Less than the MDL
na	Not Analysed
nv	No Value

Client: ESB  
 Project: Phase 2 Environmental Investigation  
 Location: ESB Tarbert, Co. Kerry  
 Job No: 49341640  
 Table 14: Surface Water Analytical Results: SVOCs

Sample Type				Surface Water
Laboratory				Alcontrol
Sample ID				SW43
Date				27-Dec-08
Parameters	Units	MDL	EQS	
Phenol	ug/l	1	0.5	-
2-Chlorophenol	ug/l	1	nv	-
2-Methylphenol	ug/l	1	nv	-
4-Methylphenol	ug/l	1	nv	-
2-Nitrophenol	ug/l	1	nv	-
4-Nitrophenol	ug/l	1	nv	-
2,4-Dichlorophenol	ug/l	1	nv	-
2,4-Dimethylphenol	ug/l	1	nv	-
4-Chloro-3-methylphenol	ug/l	1	nv	-
2,4,6-Trichlorophenol	ug/l	1	0	-
2,4,5-Trichlorophenol	ug/l	1	nv	-
Pentachlorophenol	ug/l	1	2	-
1,3-Dichlorobenzene	ug/l	1	nv	-
1,4-Dichlorobenzene	ug/l	1	nv	-
1,2-Dichlorobenzene	ug/l	1	10	-
1,2,4-Trichlorobenzene	ug/l	1	0.4	-
Nitrobenzene	ug/l	1	nv	-
Azobenzene	ug/l	1	nv	-
Hexachlorobenzene	ug/l	1	0.03	-
Naphthalene	ug/l	1	nv	-
Acenaphthylene	ug/l	1	nv	-
Acenaphthene	ug/l	1	nv	-
Fluorene	ug/l	1	nv	-
Phenanthrene	ug/l	1	nv	-
Anthracene	ug/l	1	nv	-
Fluoranthrene	ug/l	1	nv	-
Pyrene	ug/l	1	nv	-
Benzo(a)anthracene	ug/l	1	nv	-
Chrysene	ug/l	1	nv	-
Benzo(b)fluoranthrene	ug/l	1	nv	-
Benzo(k)fluoranthrene	ug/l	1	nv	-
Benzo(a)pyrene	ug/l	1	nv	-
Indeno(1,2,3-cd)pyrene	ug/l	1	nv	-
Dibenzo(a,h)anthracene	ug/l	1	nv	-
Benzo(ghi)perylene	ug/l	1	nv	-
2-Chloronaphthalene	ug/l	1	nv	-
2-Methylnaphthalene	ug/l	1	nv	-
Carbazole	ug/l	1	nv	-
Isophorone	ug/l	1	nv	-
Dibenzofuran	ug/l	1	nv	-
Dimethyl phthalate	ug/l	1	nv	-
Diethyl phthalate	ug/l	1	nv	-
Di-n-butylphthalate	ug/l	1	2	-
Di-n-octylphthalate	ug/l	1	nv	-
Bis(2-ethylhexyl)phthalate	ug/l	1	8	-
Butylbenzylphthalate	ug/l	1	nv	-
4-Chloroaniline	ug/l	1	nv	-
2-Nitroaniline	ug/l	1	nv	-
3-Nitroaniline	ug/l	1	nv	-
4-Nitroaniline	ug/l	1	nv	-
2,4-Dinitrotoluene	ug/l	1	nv	-
2,6-Dinitrotoluene	ug/l	1	nv	-
Bis(2-chloroethyl)ether	ug/l	1	nv	-
4-Bromophenylphenylether	ug/l	1	nv	-
4-Chlorophenylphenylether	ug/l	1	nv	-
Hexachloroethane	ug/l	1	nv	-
Hexachlorobutadiene	ug/l	1	0.1	-
Hexachlorocyclopentadiene	ug/l	1	nv	-
Bis(2-chloroethoxy)methane	ug/l	1	nv	-
N-nitrosodi-n-propylamine	ug/l	1	nv	-
SVOC-TIC	ug/l	nv	nv	nd

EQS	EPA Proposed Environmental Quality Standards for Surface Waters
xx	
MDL	Method Detection Limit
-	Less than the MDL
na	Not Analysed
nv	No Value